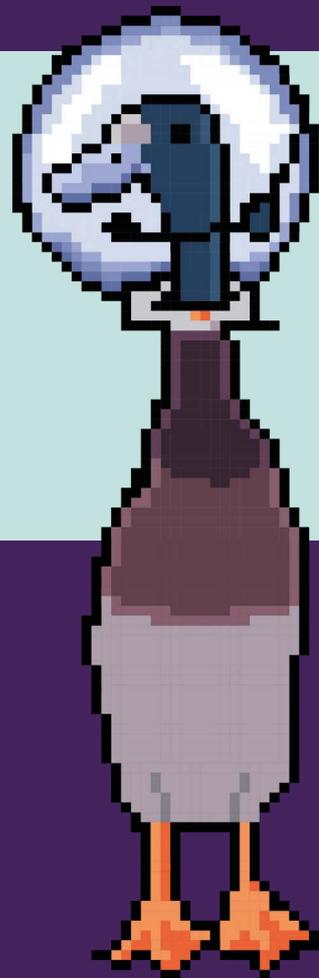




iGGi CONFERENCE 2023
13-14 SEPTEMBER



iGGi

The EPSRC Centre for Doctoral Training
in Intelligent Games and Game Intelligence

www.iggi.org.uk
@iggi-phd





A big thank you goes out to our this year's conference sponsor Sony Interactive Entertainment. iGGi's collaboration with Sony Interactive Entertainment includes placements, co-supervision, talks and presentations, and Industry Advisory Board membership.

A WORD FROM THE iGGi CON 2023 SPONSOR:

At Sony Interactive Entertainment the maker of the PlayStation family of products we are transforming the experience of play. To achieve this, we are teaming up with brightest minds in academia to research areas such as computer vision, human cognition, network efficiency, virtual reality, human-computer interfaces, and artificial intelligence.

We tailor our academic research approach to get the best outcomes from specific opportunities and to meet the needs of individual institutions, so our collaborations take on different

forms – e.g., student placements, sponsored doctoral research, or access to technology to support groups working on topics of mutual interest.

In all cases we are creating long term partnerships where academic researchers and Sony Interactive employees join forces in a fun, disruptive environment to dream up the future of entertainment.

Our door is always open so if you have an idea or want to know more please reach out to us academia@sony.com

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DIRECTOR'S WELCOME

Welcome to the 2023 iGGi Conference! – a chance for games researchers, especially iGGi PhD researchers, to meet each other and those interested in the future of games.

The annual iGGi conference brings together PhD researchers, supervisors and staff from the EPSRC Centre for Doctoral Training in Intelligent Games and Game Intelligence (iGGi) with practitioners from industry and the third sector. We will share our latest work, welcome our new cohort of PhD researchers, and forge new connections for research collaborations and placements.

With a total of 120 recruited PhDs, iGGi is the world's largest doctoral programme in games research. As its name suggests, iGGi advances across two fronts:

Intelligent Games (iG): Advancing game AI, analytics, design, and responsible innovation to boost the UK games industry;

Game Intelligence (Gi): Advancing applied gaming for social and scientific impact..

Now in its tenth year, iGGi has continued to thrive (and that despite the huge impact of COVID). We have a steady stream of students graduating and going on to research and industry positions. The research they have produced is making a real difference to the whole field of games research and to the industry partners we have worked with. This year we have a larger-than-normal group of 16 new PhD researchers joining the iGGi programme, to commence their four years of training and research, and around 60 PhD researchers who are further along in their PhD research. It's a key year for iGGi – it is our 10th intake, and it is not currently clear where the funding will come from for future intakes. There's still more than four years for you to get (more!) involved.

To find out more about how you might work with us, do get in touch with me or any of the iGGi staff. I hope you really enjoy the conference and I am very much looking forward to talking about life, the universe and games research with you.

The iGGi Management Team:

Prof. Peter Cowling, iGGi Director at QMUL and the iGGi Management Team

WHAT IS iGGi?

The EPSRC Centre for Doctoral Training in Intelligent Games and Game Intelligence (iGGi) is a £25 million EPSRC Centre for Doctoral Training with the mission to develop cutting-edge research the games industry needs and to transform the way the games industry works with the academic community. iGGi is a collaboration between the University of York, the University of Essex, Goldsmiths, University of London, and Queen Mary, University of London, as well as more than 60 games industry partners like Creative Assembly, AI Factory, UKIE, TIGA, or Sony.

iGGi projects are organised around two main themes:

1. INTELLIGENT GAMES

Using research advances to seed the creation of a new generation of more intelligent and engaging games.

2. GAME INTELLIGENCE

Using games as a data source and tool to further science and societal wellbeing.

Around these themes, iGGi enables industry partners to access and influence research in analytics, artificial intelligence (AI), audio, computational creativity, design, engagement, gamification, human-computer interaction, psychology, and software development. iGGi students and researchers are already working with game studios, startups and Fortune 500 companies like Bossa Studios, BT, Google Deepmind, Media Molecule, MindArk, Microsoft, Prowler, Splash Damage, Square Enix, Sony or Visteon to develop more engaging, human-like AI, create radically faster ways of balancing games or use machine learning to produce new forms of art and heritage experiences.

HOW TO GET INVOLVED

The main way to engage with us is through our students. iGGi is a highly competitive PhD programme, attracting top creative and technical talent from around the world and a wide range of backgrounds. Working with our students, you can conduct, access and embed cutting edge research in your organisation, kick-start collaboration with our researchers, and build relationships with potential future recruits.

While we are always open to find an arrangement that fits you, here are some of the usual ways that partners have become involved:

Placements: These can last from 2 weeks to 6 months and are negotiated to suit your company needs.

Sponsorships: Partly or fully sponsor a research project that aligns with your interests to make it happen and enjoy a preferential working relationship or IP agreement.

Co-supervision: Specify research topics of interest to you for our annual recruitment cycle in return for ongoing support and guidance when the fitting student is recruited.

Industry days: Half- or full-day sessions with students such as mini-conferences, networking events workshops, design jams or hackathons around particular themes of your interest, hosted at one of our sites or on your premises.

Coaching and mentoring: Even something as minimal as occasional emails is a great way to build relations with iGGi students and share your valuable knowledge and experience.

Access to data, software or facilities: Access to game data is essential to our research, while our analyses can provide deep insight into your players and design challenges. Access to industry software means our research is exposed to the acid test of industry work environments – and its results are far easier to integrate for you. And while universities have excellent resources, there is always equipment to which we would like to have access.

Student offers: Introduce students to your organisation or products through discounted memberships or subscriptions during their PhD.

Interested?

We always welcome new partners. If you are interested, please contact, Susanne Binder, the iGGi Manager for External Relationships on iggi-admin@york.ac.uk

iGGi PARTNERS AND COLLABORATORS

Here's a selection of recent and current iGGi Partners.

17 Oranges

AI Factory

BAME in Games

Bossa

Creative Assembly

DeepMind

Die Gute Fabrik

Earcom

ESL

Failbetter Games

Fusebox Games

Game Republic

Google Research

Human VR

Inhalation

InstaDeep Ltd

ITU Copenhagen

King

Kythera AI

Laika

Magnopus Limited

Microsoft Research

mod.ai

NATS

Nemisindo

Player Research

Revolution Games

Rewind

Safe In Our World

Shanghai Jump Net Technology Co., Ltd.

Sony Interactive Entertainment

Splash Damage

Square Enix

Squingle Studios

Sumo Digital

Swords Narrative

Take This

Team Genj

The Chinese Room

TIGA

Tommy Tompson

Toshiba

UKIE

weavr.tv

Women in Games



**iGGi Con 2023 – sponsored by
Sony Interactive Entertainment**

THE iGGi MANAGEMENT TEAM AND iGGi STAFF

Prof. Paul Cairns, iGGi Chair (UoY)

Prof. Peter Cowling, iGGi Director (QMUL)

Tracy Dancer, iGGi Manager (UoY)

Susanne Binder, iGGi Manager (QMUL)

Dr Jeremy Gow, iGGi Training Coordinator (QMUL)

Dr Ben Kirman, iGGi Training Coordinator (UoY)

Dr Raluca Gaina, iGGi Outreach Coordinator (QMUL)

Dr Diego Pérez-Liébana, iGGi Industry Liaison (QMUL)

Dr James Walker, iGGi Industry Liaison (UoY)

Dr Laurissa Tokarchuk, iGGi Research Collaboration Coordinator (QMUL)

Dr Debbie Maxwell, iGGi Research Collaboration Coordinator (UoY)

Prof. Simon Lucas, iGGi Co-Investigator (QMUL)

Prof. Simon Colton, iGGi Co-Investigator (QMUL)

Helen Tilbrook, iGGi Administrator (UoY)

Shopna Begum, iGGi Administrator (QMUL)

Prof. Richard Bartle, iGGi Co-Investigator (Essex)

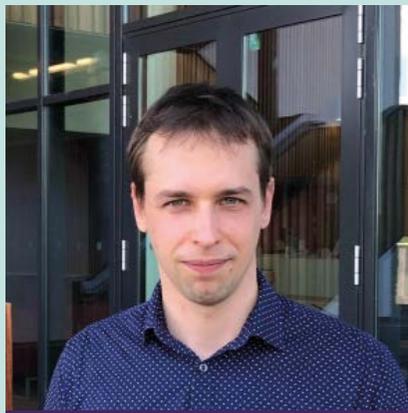
Dr Michael Fairbank, iGGi Co-Investigator (Essex)

Prof. William Latham, iGGi Co-Investigator (Goldsmiths)

Prof. Sebastian Deterding, iGGi Responsible Innovation Lead

Dr Catherine Flick, iGGi Responsible Innovation Lead

iGGi RESEARCHERS



ÁDÁM KATONA

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Skills: Machine Learning, Evolutionary computation

BIOGRAPHY

Ádám did his MSc in mechatronics at Budapest University of Technology and Economics. After graduation, he spent two years working on automated driving at Robert Bosch GmbH, during which he got exposed to both the classical and the machine learning approach of creating intelligent agents.

EVOLVING EVOLVABILITY FOR NEUROEVOLUTION

Evolutionary computation continues to surprise us by producing creative and efficient designs. However despite our best efforts, artificial evolution had not produced anything as complex and interesting as natural evolution. As our hardware is becoming faster and number of cores in our chips increase, the lack of computational power is becoming less of an excuse. It is starting to become more and more obvious that some fundamental component of natural evolution is missing from our simulations. One possible candidate is the evolution of evolvability. Evolution seems to produce organisms which are well suited for further evolution. The goal of my research is to find mechanisms which allows evolution to increase evolvability, and incorporate these in the design of more efficient neuroevolution algorithms. This research is in the intersection of evolutionary computation, evolutionary developmental biology and neural networks.



ADRIÁN BARAHONA-RÍOS

University of York

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Skills: Procedural audio, generative deep learning, neural audio synthesis, sound design, game audio

BIOGRAPHY

Adrián comes from an audio background and has worked in the past as a recording engineer for the Spanish localisation of games such as Fallout 4 or Until Dawn. He holds a BA in Music Production and a MSc in Sound Design. During this journey he focused his career in machine learning and procedural audio, exploring ways to create models for interactive applications by using different techniques.

DEEP LEARNING FOR THE SYNTHESIS OF SOUND EFFECTS

Adrián is a final year iGGi PhD student. In collaboration with Sony Interactive Entertainment Europe, he is researching the use of machine learning for the synthesis of sound effects.



ALAN PEDRASSOLI CHITAYAT

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Skills: Machine Learning, Storytelling, Audience Experience Research

BIOGRAPHY

Alan is a York graduate who focuses on esports research. Having worked in the esports industry, both as a software engineer and as a researcher, Alan has amassed valuable experience and insight into the field's workflow and requirements. Prior to his PhD, Alan has worked as a software engineer for 4 years, where he supported machine learning and data science research. During this period, he was given the opportunity to start his own research in the field of esports, which led to this PhD.

APPLYING MACHINE LEARNING TECHNIQUES TO ENHANCE ESPORT AUDIENCE EXPERIENCE

Alan's primary focus is on the field of Applied Machine Learning (ML) for Digital Storytelling.

His research focuses on extracting data from esports game coverage, from game design data to player's mental models. He then uses this data to train ML models to predict and classify events within a live match. These models are then used to power insightful visualizations, which aim at exploring and explaining the surrounding context.

By contextualizing the output of a complex model through visualization, Alan's research can improve on black-box methodologies that are typically used in the literature and in the industry. Through explaining and detailing the context of models, this research can enhance the audience experience through storytelling. This reduces the barrier of entry for new audiences as well as engages and excites existing spectators. This is designed to cater for both live and on-demand scenarios (such as through Twitch or YouTube).



ALEX FLINT

University of York

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Skills: Games User Research, Player Experience, Research Operations

BIOGRAPHY

Alex has an academic background in Psychology and Human-Computer Interaction, and their Master's dissertation comparing measures of perceived challenge and demand in video games was published at the recent CHI 2023 conference. Alex currently works as a Research Operations Consultant for PlaytestCloud and a freelance Games User Researcher. They are also a Student Video Games Ambassador for UKIE, and regularly volunteer at conferences such as CHI Play and the GamesUR Summit. When they aren't at their desk, you can find Alex figure skating or DJing 80's rock.

LEVELLING UP THE NARRATIVE TESTING PRACTICES OF INDIE VIDEO GAME DEVELOPERS

Narrative testing is a specialised games user research (GUR) practice that requires resources and knowledge not easily accessible to indie developers, meaning they are often disadvantaged compared to their larger AAA counterparts. Thus, my work proposes the direct study of indie developers to level the playing field by democratising narrative testing best practices and empowering non-research team members to conduct GUR activities. I aim to achieve this goal by:

1. Defining narrative testing best practices.
2. Identifying key challenges indie developers face when evaluating narrative.
3. Co-designing and evaluating narrative testing prototype(s).
4. Assessing methods for disseminating GUR knowledge.

The successful completion of this work will impact how indie studios conduct narrative testing, ultimately leading to the creation of better games.



AMY SMITH

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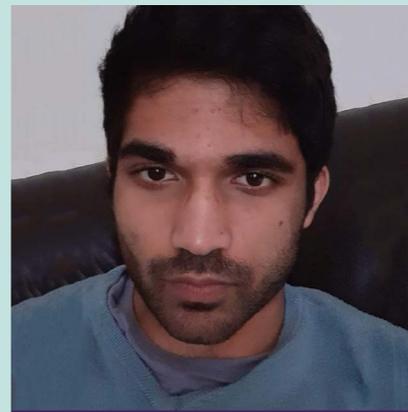
Skills: Research Skills

BIOGRAPHY

After completing a BA in Fine Art at Bath School of Art and Design, Amy spent some years as a tattoo artist traveling and creating artworks. Her curiosity about learning to code then led her to complete a conversion Masters degree in Computer Science at the University of Birmingham. After graduating, Amy then joined the iGGi programme based at Queen Mary University London, where her PhD research is currently at the intersection of the visual arts and generative deep learning, specifically the affordances of text-to-image technology.

LANGUAGE STRATEGIES IN USER PROMPTING FOR 'TEXT-TO-IMAGE' GENERATIVE DEEP LEARNING MODELS

Amy is currently working on identifying user prompting strategies for text-to-image generative deep learning models, such as Midjourney. Three emergent strategies have been observed during a pilot study, and there is ongoing work to confirm these strategies within a larger data set (taken from Midjourney users during the summer of 2022). The data is split in to prompting 'sessions' and early results suggest that users employ a combination of the identified strategies.'



BOBBY KHALEQUE

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BIOGRAPHY

Bobby Khaleque is an iGGi student focused on and modelling exploratory behaviour and procedural content generation for levels which support exploration. After completing a Bachelors in Computer Science and a Masters in Artificial Intelligence both at QMUL he decided to pursue games research particularly for PCG and player experience due to the lack of research, in regard to games, aiming to provide experiences that put a main focus on exploration.

MODELLING EXPLORATORY BEHAVIOUR

Exploratory behaviour can be thought of as the act of exploring with intellectual or scientific curiosity, having nothing to do with survival. Exploratory behaviour can appear in a variety of game genres such as; adventure games, survival games and first person shooters.

An exploratory agent can be used to model exploratory behaviour. It is a type of AI agent which traverses a level and evaluates it in accordance to it's features. They observe which features are available in the level according to a metric(s) and builds an array of target objects that could be interesting and move in the direction of the closest one.

PCG focused on exploratory behaviour might help developers during the game design process by quickly creating environments which are already built around player exploration. A further research goal of his project is quality evaluation for generated environments to investigate how well they might support exploration.



CALLUM DEERY

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Skills: Games user research, Games
accessibility, Design and Development

BIOGRAPHY

Callum is a researcher and game developer investigating real-time player experience measurement, with a background in computer science, UX design and, game accessibility.

EMBEDDED QUESTIONNAIRES FOR ADAPTIVE GAMES

Aiming to use questionnaires snuck into gameplay to measure player experience, Callum is investigating how the dynamic nature of games and players interacts with experience measurement and, how real-time feedback can be used by designers and researchers to understand (and improve) games.



CAMERON JOHNSTON

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Skills: Python C# C++ HTML CSS

BIOGRAPHY

Cameron graduated from the University of Edinburgh with an MPhys in Theoretical Physics, where he researched into the usage of wastewater based epidemiology in the localised detection of COVID-19 in an urban population. For this, he created simulations of both infectious diseases and fluids over networks to model large scale population dynamics. His interest in procedural content generation stems from his first large coding project -- a real-time interactive Newtonian simulation of the inner planets of the solar system. Since then, he has been fascinated in the usage of physics in real-time simulations.

IMPOSSIBLE PHYSICAL MODELS

Physics simulations are commonplace in modern games. From procedural interactions between dynamic objects (water, ropes, collisions, and destruction) to the rules that define generation of virtual worlds. These physics are defined by real-world constants and parameters that reproduce realistic effects, but what if these rules were different? The aim of this project is to explore how authentic simulations of unrealistic physics would create unique and creative game-play opportunities. Successful completion of this project would see a toolkit be created for existing game engines to expand the freedom developers have to control their worlds' physics, and to allow educators to demonstrate topics in physics that would otherwise be inaccessible to recreate.



CARLOS GONZALEZ DIAZ

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Skills: ML Engineering, Movement Technologist

BIOGRAPHY

Carlos is a Post-Doctoral researcher at the Human-Centred AI Institute at the University of Augsburg (Germany). He is awaiting to defend his PhD at the University of York. He holds an MSc in Serious Games at the University of Skövde (Sweden) and a BSc in Software Engineering (Spain). He is been closely connected with industry throughout his PhD, having worked in the last years for Microsoft Research, Sony Interactive Entertainment R&D, Musemio Ltd R&D and Goldsmiths, UoL; as well as done consulting for tech companies such as Unity Technologies.

INTERACTIVE SUPERVISED LEARNING FOR VR MOTION CONTROL GAMEPLAY CREATION

The purpose of my academic research is to advance game technologies by democratising the use of ML techniques among non-experts through innovative tools and plugins for game engines. I developed the succesful ML visual scriting language InteractML (interactml.com) and used mixed-methods research approaches to understand how to better support VR game developers and the challenges behind human-AI interaction.

I had several technical jobs throughout my PhD, as my expertise is highly applicable in both industry and academia. Thanks to the broad range of expertise that I gathered through the last decade of industrial and academic work, I can tackle the challenges emerging from the inter-disciplinary nature of modern computers: where user psychology, immersive technology and artificial intelligence intersect.

Please refer to my website for complete up-to-date publications. Feel free to reach out if you want more information or want to chat about how I could help your company/lab.



CHARLINE FOCH

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Skills: Qualitative research (surveys, interviews, workshops), research communication, game design and development.

BIOGRAPHY

Charline first came to the UK in 2011 to study English and Film Studies at King's College London, before going on to a MSc in Film, Exhibition and Curation at the University of Edinburgh. By chance, accident or fate, she stumbled into the games industry, working in an independent game studio in Berlin, where she touched upon customer support, community management, content writing and QA for a new MMORPG. This experience gave her the push to start a PhD in video games. In her spare time, she is an avid film viewer, volleyball player, and amateur artist.

GAME (NOT) OVER: UNDERSTANDING AND HARNESSING THE PERCEIVED DESIRABLE EFFECTS OF PLAYER FAILURE IN VIDEO GAMES.

Charline's research focuses on how people conceptualise failure, with an emphasis on its perceived positive, desirable effects on player experience. Throughout her PhD, she has conducted research among video games players to gain a better understanding of what they perceive as the purpose and value of failure in the games they play; and conducted research among video games developers to gain a better understanding of what processes, obstacles, and ideas go into the design and implementation of failure in their games. With a focus on single-player, more narrative-driven games, she has used this research to design a cards-based design toolkit to support game designers in approaching the question of fail states and player experience in the early stages of the game development process, helping them reflect on the intersection between failure, game mechanics, storytelling, and player experience when working on their games.



CONNOR WATTS

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Skills: Machine Learning, Bayesian Statistics, Software Development

BIOGRAPHY

I am a machine learning research engineer and software developer with commercial experience deploying and maintaining models for start-ups and larger organizations. I have experience researching and developing novel algorithms, as well as designing custom environments for application in domains such as combinatorial optimization, finance and games.

SCALABLE BAYESIAN REINFORCEMENT LEARNING IN THE GAMES INDUSTRY

One of the main challenges in reinforcement learning is identifying good data sampling strategies that effectively balance between exploring the space of all possible policies, and exploiting the trajectories that have yielded better outcomes so far. Through incorporating uncertainty estimation and prior knowledge into the learning process, Bayesian reinforcement learning naturally balances this exploration-exploitation trade-off, making it a natural candidate for application in these environments. However, Bayesian reinforcement learning algorithms are more computationally intensive, which has hindered their wide-spread adoption. The proposed study will investigate methods to scale Bayesian reinforcement learning to handle large-scale problems, while maintaining computational efficiency and accuracy. On successful completion, this study will result in more efficient and stable training of reinforcement learning agents in the games industry. Through this, reinforcement learning algorithms can be more easily integrated into the design pipelines, resulting in quicker and more stable development as well as enhanced user experience.



CRISTINA DOBRE

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BIOGRAPHY

I have a theoretical background in CS completing with distinction an UG degree when I explored automatic detection of duplicate questions in Q&A platforms by learning semantic representation of queries.

SOCIAL INTERACTIONS IN IMMERSIVE VIRTUAL ENVIRONMENTS: PEOPLE, AGENTS, AVATARS

I focus is on the nonverbal cues that influence and shape the social interaction in immersive VR environments. I'm investigating autonomous agents (virtual humans) in social settings in terms of non-verbal interactions with users. I'm interested in the underlying mechanics of social interaction that help developing an emphatic and engaging virtual human. I'm working on ML models based on multimodal data to detect various social cues or human-defined concepts in social interactions in VR. I'm also interested in generating more complex behaviour for virtual characters (NPCs) that will improve the user's experience with the NPCs in a social VR. The findings from my research can help game designers and game developers determine the appropriate non-player character's non-verbal (and verbal) behaviour in games, especially in VR games. Along with its applications in the games industry, the findings would be useful for other applications such as designing multi-modal human-machine interactions and other systems for medical purposes, for social anxiety disorders therapy, simulations, training or learning.



DAN COOKE

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Skills: Finance, Accounting

BIOGRAPHY

Dan has a keen interest in the world of finance and how traditional finance interacts with the gaming industry. He is interested in how criminals use videogame ecosystems for crime and money laundering purposes. He has a background in Accounting and Finance and graduated with a MA in Applied Accounting from De Montfort university in 2019. Outside of his professional life he has an interest in E-Sports and competitive gaming and the content creation and monetisation of these industries. His research interests include money laundering in secondary video game markets, video game monetisation and how users experience with monetisation and secondary markets.

DETECTING MONEY LAUNDERING IN VIDEO GAMES THROUGH SECONDARY MARKETPLACES

Dan's research has a focus on how criminals can use secondary video game markets for the purposes of money laundering. This includes using internal (developer supported) and external (community ran) systems for the purposes of money laundering. His research aims to identify the scale of the issue and provide ways to identify laundering in these markets as well as investigating safeguards that could be implemented in order to mitigate the risks of money laundering occurring in video game secondary markets.



DAN GOMME

University of Essex

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Skills: Player Experience, HCI, UX

BIOGRAPHY

A longtime programmer having turned to the dark arts of psychology and statistics to figure out some of how humans tick, Dan's always been interested in both machines and the people that use them. He's played a good few games older than he is, and some that are probably more complex too. Much as he has a BSc in Computer Games from the University of Essex, he's curious about nearly everything – music, magic, writing, design... The list goes on, and he hopes to get vaguely close to mastering even one of them some day.

MEETING THE EXPECTATIONS PLAYERS HAVE OF STRATEGY GAME AI

We all know that there's room for improvement when it comes to AI in games. But what's better, what's an improvement there? Is it AI winning just the right amount? Or is there some finer nuance to the problem? That's where I come in. By doing the unthinkable – asking players about their experiences with strategy game AI – I've been exploring their frustrations, and the expectations that players seem to have of the opponents they play against. By further investigating what these expectations are (such as providing suspense and tension in competition), and how to better meet those expectations, we can improve player experiences even in domains where we don't yet have the computing power to make players that can match human skill.



DIEN NGUYEN

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Skills: Game Design, Unity, Python, Pytorch, C++, Reinforcement Learning

BIOGRAPHY

I graduated from the University of California, Irvine with a BSc in Computer Game Science and a Minor in Statistics. My undergraduate thesis focused on augmenting Monte Carlo tree search with a value network trained through a self-play framework similar to AlphaZero. During my undergraduate degree, I became interested in the intersection of games and artificial intelligence – applying methods of reinforcement learning, graphical models, and knowledge representation to game playing and game design. My long-term goal is to work on the problem of formalizing game elements, representing game systems in a way that allows for automatic reasoning and inference. I also enjoy playing games where I can customize and theorycraft my playstyle to satisfy certain gameplay fantasies while beating the game.

EFFICIENT AUTOMATED PLAYTESTING OF TABLETOP GAMES

My current research is within the field of Automated Game Design Learning, an emerging field in AI research with the purpose of learning game design models through playing. The current strategy is to play out the full game in thousands of iterations, which can be impractical for complex games with large state space and computationally expensive

forward models. My research will focus on applying Go-Explore – a recent exploration paradigm that outperforms many state-of-the-arts – to improve the efficiency of automated playtesting of tabletop games by using an archive of interesting game states to reduce the time needed for self-play. The research will be primarily conducted within the TAG framework and aim to be game-agnostic. On successful completion, this research will improve game development cycles, resulting in higher-quality games, and potentially give unique insights into the game design process.



DIMITRIS MENEXOPOULOS

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Skills: Game Audio, Music Composition, Sound Design, Audio Technology, Audio Programming, Audio Implementation

BIOGRAPHY

Dimitris Menexopoulos is a versatile composer, sound designer, audio technologist and multi-instrumentalist from Thessaloniki, Greece. He has two solo albums under his name (Perpetuum Mobile – 2017, Phenomena – 2014) two EPs (Modern Catwalk Music – 2022, 40 EP – 2020), two published soundtracks (Iolas Wonderland – 2021, The Village – 2019) as well as various performances internationally. As a designer, he has presented work at sites including the Barbican Centre (Nesta FutureFest – 2019, with Akvile Terminaite), the Somerset House (24 Hours in Uchronia with Helga Schmid – 2020) and Christie’s London (Christie’s Lates – 2023, with Scarlett Yang). His original Max/MSP devices have been displayed at venues in the UK (Iklectik – 2020), France (IRCAM – 2020, 2019) and in the USA (Mass MoCA – 2019).

EXPLOITING GAME GRAPHICS RENDERING FOR SOUND GENERATION

Procedural content generation supports the creation of rich and varied games, but audio design has largely not kept pace with such innovation. Often the visual assets in the scene may be procedurally rendered, yet audio developers still rely mostly on pre-recorded samples in order to carry out their tasks. However, much of the information required to determine smooth audiovisual interactions is already present in the game engine. For example, the size, shape, material and movement of assets offer potential types of data that can be mapped to sound model parameters. This research explores how graphics information can directly drive sound algorithms.



DOMINIK JEURISSEN

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Skills: Playtesting, Reinforcement Learning, Intrinsic Motivation

BIOGRAPHY

I always had a fascination for automating complex tasks. As a result, my bachelor focused on software development paired with applied mathematics, and my master focused on Artificial Intelligence. I'm particularly fascinated by reinforcement learning (RL) and continual learning. I currently focus on self-motivated RL and integrating large language models with RL. I enjoy playing board games with friends and cooking during my spare time.

DIVERSE PLAY USING INTRINSIC MOTIVATION

I'm collaborating with Creative Assembly to create automated playtesting methods for Total War. I plan to achieve this goal by creating a self-motivated AI. A self-motivated AI should explore games without relying on a pre-defined goal. Instead, the AI should keep challenging itself to find new and exciting things to do in the game. One way to achieve this is through intrinsic motivation, in which we provide an AI with motivations like curiosity or empowerment. However, existing methods for intrinsic motivation usually only utilize one type of motivation. My goal is to provide agents with a wide range of motivations, hopefully creating much more diverse agents.

But, at the moment, I'm looking into enhancing agents with large language models (LLMs). The primary reason is that RL agents are slow learners and do not possess the ability to think abstractly. My hope is that the reasoning capabilities of LLMs might solve this, thus allowing me to apply intrinsic motivation on a much more abstract level than previously possible.



DORUK BALCI

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Skills: Game Design, Digital Art, C#, Unity, Godot

BIOGRAPHY

I am a first-year PhD student at the University of York, and a game maker interested in the relationship between player creativity and game design. I have been making games independently since 2019, and worked as a designer in the industry as well. I studied Economics at Bo_aziçi University (BA) and Game Studies at Tampere University (MSc). My other interests include: drawing, literature, cooking and playing with tools I don't really understand.

DESIGNING GAMES FOR REFLECTION AND APPROPRIATE CREATIVITY

How do we make games which we want to be messed with, changed fundamentally beyond our expectations in play? How do we make up rules that are intended to be broken? Why would we want that? Play practices that transform structures, subvert expectations and re-define their contexts are celebrated in many aspects of culture and can lead to personal and meaningful experiences. However, engaging with this phenomenon directly through game design has received somewhat scarce attention. We often frame these play-practices in a way that is antagonistic to game design, emerging out of inventiveness of players, happening despite the constraints of the game. This project aims to explore an alternate route, investigating how we can try to invite players to reflect on play and appropriate the structures that define their experiences.



ERIN ROBINSON

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Skills: Media Artist, Generative Design

BIOGRAPHY

Erin Robinson is a media artist and PhD researcher with iGGi researching user-defined materials, a participatory approach to interaction design. Her work seeks to empower audiences to meaningfully contribute content to artworks which reflect their personal identities, narratives and interests. In her personal practice, Erin is inspired by the interplay between technology and the natural world. She uses digital technologies to synthesise hybrid organisms and develop artistic techniques that challenge anthropocentrism and mirror the interconnectivity between humans, non-humans and digital entities.

USER-DEFINED MATERIALS IN INTERACTIVE ART

Erin's research seeks to develop design strategies for interactive digital media using user-defined materials. Unlike traditional interactive methods in digital interactive media which allow users to select or manipulate material chosen by the designer, user-defined materials refer to the method in which users or audience members can provide the foundational material for interactive systems. Through open-ended mediums, such as video, text, or sound recordings, users are given the opportunity to contribute material that can reflect the scope of their imagination. By focusing on these material interactions, the possibility space offered by systems can be expanded indefinitely to include human behaviour, shifting the focus from the flexibility of digital systems to the extent of user input.



EVGENII KASHIN

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EVGENII KASH

Evgenii, a Computer Science enthusiast, began crafting games in school using the Warcraft3 editor. He spent five years as a Machine Learning Engineer, excelling in computer vision and graphics. His work at Snap included creating engaging lenses and researching 3D object capturing. An ECCV2020 article on face manipulation, with over 100 citations, is a testament to his prowess. Away from work, he enjoys bouldering, hiking, racing, and gaming. My research is dedicated to establishing a cost-effective approach for creating and generating 3D scenes for game development, a critical aspect of modern VR/AR applications. Harnessing the potential of generative visual content, I aim to develop algorithms capable of realistically completing 3D scenes from a few images. This could revolutionize the entertainment and creative industries, particularly game development. Picture having only a couple of images from your favourite film and envisioning the entire scene. Such technology can enhance the efficiency of 3D artists, democratize game development, and serve as entertainment in itself. Currently, I am developing an algorithm to achieve this goal. The proposed solution employs a general pretrained text-to-image model for supervision, with a NeRF 3D representation of the scene. The central concept involves iterative outpainting, where each iteration updates the NeRF weights.

GLOBAL CONSISTENCY IN REALISTIC SCENE COMPLETION USING TEXT-TO-IMAGE MODELS AS PRIORS

I provided a general description above, but here is the more detailed version: This research focuses on generating semantically plausible scene continuation from a given part of a scene. While there are methods that are solving the text to 3D problem, these mainly concentrate on generating specific objects rather than indoor or outdoor environments. This research aims to address several important questions:

1. How can we generate a scene consistent with the style of a provided part of the environment? It may be forced through additional text description or by extracting the semantic meaning from provided data.
2. How can we create a content that is not just semantically meaningful, but also globally plausible? For example, the completion of a bedroom scene with multiple beds would be semantically acceptable, but it is not globally consistent.
3. How can we generate photorealistic content that would be perceived as a real environment? Existing methods tend to produce oversaturated, cartoonish content when using SDS loss. Whereas direct usage of image to text models produces locally realistic content, but only from specific views and may not hold up when viewed from novel perspectives.



FILIP SROKA

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Skills: Creativity and problem-solving

BIOGRAPHY

Filip is a Computer Science researcher specializing in Game AI. He acquired an Integrated Masters in Computer Science from Queen Mary University of London and is pursuing a PhD in Game AI with iGGi. With a passion for algorithms and problem-solving, he constantly seeks new challenges to enhance his skills. As an avid LEGO collector and investor, he has unique technical and creative skills. He is excited about the potential of the Metaverse and is driven by the role of technology in shaping its future.

ENHANCING SKILL ACQUISITION IN VR RHYTHM GAMES: LEVERAGING DDA AND PCG FOR EFFECTIVE LEARNING MAP GENERATION

His research focuses on integrating Dynamic Difficulty Adjustment (DDA) and Procedural Content Generation (PCG) into VR rhythm games like Beat Saber. Leveraging advancements in VR technology, including eye and face tracking, his research aims to enhance players' skills and motivation. By addressing difficulty spikes, personalized learning experiences are created, exploring effectiveness, player engagement, and skill development hypotheses. Core steps involve psychological signal detection, DDA implementation, PCG algorithm development, and an AI Coach system. The research aims to expand findings to other rhythm games and benefit players, game developers, and the health and fitness industry.



FLORENCE SMITH NICHOLLS

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Skills: Creative computing, narrative design, archival research, games curation

BIOGRAPHY

Florence has a BA in Classics from the University of Cambridge and an MA in Mediterranean Archaeology from University College London. Prior to their PhD research they worked as a field archaeologist and heritage consultant for 7 years, including roles at Museum of London Archaeology and Land Use Consultants. They are also a freelance games writer and narrative designer, having worked as a Story Tech for the indie studio Die Gute Fabrik on the upcoming adventure game Saltsea Chronicles. They are a member of the 2022 Game Awards Future Class.

PROCEDURAL GENERATION AS GENERATIVE ARCHAEOLOGY

Generative archaeology games require a player to archaeologically interpret and record procedurally generated content. Players interpret the past events of the gameworld through environmental storytelling, and record them through various mechanics such as photography and map-making.

Thus far, Florence has conducted two studies on player responses to generative archaeology games with their supervisor Mike Cook, using the game Nothing Beside Remains as a case study. NBR is an exploration game in which a player traverses a procedurally generated

ruined village. The initial results of a study asking players to interpret the village remains in NBR were presented in the PCG Workshop at the Foundations of Digital Games Conference in 2023. A second study asked players to draw maps based on their playthrough experience, which will be presented at the upcoming Roguelike Celebration conference.

Florence has also conducted digital archaeological fieldwork in the game Elden Ring, which was presented at the Foundations of Digital Games Conference in 2022 and won the Best Paper award. They took part in a placement collecting contextual information for interactive fiction at the British Library, and were subsequently commissioned to produce playthrough videos for the Library's Digital Storytelling exhibition.



FRANCESCA FOFFANO

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Skills: UX Research, Qualitative methods, Mix methods

BIOGRAPHY

Francesca's work represents her fascination with how players elaborate and understand complex situations in video games. She likes to use mixed methods (both qualitative and quantitative) to understand high-level player perception in video games using her competencies in HCI (MSc at the University of Trento) and Psychology (BSc at the University of Padua). Prior to joining the PhD, she developed international experience in industry and research. She worked as Research Fellow on AI and ethics for the European project AI4EU at ECLT (Ca' Foscari University of Venice) and on players' perception of adaptive videogames at Reykjavik University. She also was involved as UX Strategist in creative content for MediaMonks headquarter (Amsterdam).

WE ALL GET STUCK...BUT WHY?

Players will tell you exactly when they got stuck playing a game, but how we define stuck in the first place is still open to discussion. This PhD research aims to identify how and when this happens to help in predicting when players need support. The goal is to smoothen the player experience by reducing the need for external support (such as online guides, walkthroughs, and online forums) that might affect player immersion. The current stage of the research uses in-depth interviews to understand what players have in common, no matter what task they are doing or game they are playing. So why rely on user tests that consider singular test cases instead of understanding where they originate?



GEORGE LONG

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Skills: Game AI, Game Data, Design and Development

BIOGRAPHY

George is an iGGi PhD student interested in AI assisted game design, particularly in how it can be used to assist in the creation and balancing of game mechanics. After graduating with a BSc in Computer Science at the University of Essex, he joined iGGi in 2021 to be able to research how Artificial Intelligence can be applied specifically to reduce the prevalence of Min-Maxing in Role-Playing Games.

METAGAME BALANCING IN ROLE-PLAYING GAMES

My research focuses on the concepts of Min-Maxing and Meta in Role-Playing Games, and how we can use AI assisted game design to reduce their prevalence. Min-Maxing in Role-Playing Game refers to the idea of building a character in a Role-Playing Game by maximising their positive traits while minimising negative ones, often through exploiting game mechanics. This can cause optimal strategies to emerge which not only have the potential to upset the game balance, but when these strategies become prominent enough in the community to form a Meta, it can have wider consequences such as the shunning of players deemed not to be using optimal strategies, and loss of creative choice when building characters. There are two methods I am looking into to reduce the effectiveness of Min-Maxing. The first is using AI to discover these Min-Maxed strategies. Secondly, how AI can be used in the game balancing process to identify and modify the mechanics which enable these strategies. Currently, I am focusing on the first method, with my research looking into how we can measure the effectiveness of units in combat scenarios to identify which units could be considered unbalanced.



GORM LAI

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Skills: C++, Python, Generative AI, Procedural Content Generation, Computer Graphics, Character Animation & Modelling,

BIOGRAPHY

Gorm is currently a mature part-time PhD candidate at Goldsmiths, focusing on mixed-initiative co-creative artificial intelligence and evolutionary techniques.

He is an experienced senior graphics & game engine programmer, with a swiss army knife certificate in cross-platform development and experimental game development. He has worked on 17 commercial games since 2004; among them several BAFTA winners.

Besides video games, his portfolio includes virtual reality, and a couple of interactive installations and non-game applications. He is a cross-platform specialist, and has just in the last couple of years, helped bring games to Windows, OS X, Linux, iOS, Android, Oculus Rift and more. Going back, I have worked on most modern platforms (Xbox 360/PS2/embedded devices/ etc).

Gorm has co-founded the Nordic Game Jam as well as the Global Game Jam.

ENHANCING ARTISTS EXISTING WORKFLOWS USING MIXED-INITIATIVE METHODS

As a veteran with near 20 years of games industry experience, Gorm is aware of the challenges that developers face when producing assets for games. Using this background, Gorm is working on integrating mixed-initiative methods into Blender, the open source 3D content creation package.

Gorm is specifically working on enhancing the workflow for modelling and animating characters, using evolutionary algorithms and machine learning for background processing while presenting the results using mixed-initiative methods that focus on enhancing artists' existing pipelines.



IVAN BRAVI

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BIOGRAPHY

Ivan Bravi obtained his BSc and MSc in Engineering of Computer Systems at the Polytechnic University of Milan, Italy. In 2016 he was Visiting Scholar at the NYU's Game Innovation Lab in New York where, under the supervision of Professor Julian Togelius, he did research in the field of general videogame playing.

GAME-ANALYZING AI AGENTS

The use of Artificial Intelligence techniques has shown its potential throughout different phases of game development.

The objective of this research is to create a set of AI game-playing agents each one specialized in a specific skill that might be requested to the player. These agents can be used for multiple purposes such as: game analytics to measure the balance between different skills required or a library for NPC's behaviors.



JAMES GARDNER

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Skills: Computer Vision and Machine Learning

BIOGRAPHY

I am a first-year PhD student at The University of York, supervised by Dr William Smith. My research focuses on deep inverse rendering for photorealistic augmented reality, specifically on designing models that can infer properties of the world, such as illumination, reflectance, and shape, from a small number of visual observations. I'm particularly interested in implicit neural representations, generative models and self-supervised learning. I hold an MEng in Electronic Engineering from The University of York, for which I was awarded the IET Prize for outstanding performance and the Malden Owen Award for the best graduating student on an MEng programme. I am currently on a research internship at Toshiba Computer Vision Research Group in Cambridge, working on SLAM applications using Neural Fields such as NeRF.

SELF-SUPERVISED INVERSE RENDERING FOR PHOTOREALISTIC AUGMENTED REALITY

Humans are extraordinary at understanding their physical world. For example, when entering a new environment, we instantly understand any objects in the scene, including their positions, materials and uses. We can also predict what the scene would look like from another unseen perspective. Furthermore, we can model the intents

of other dynamic actors within that environment. Our brains draw on prior knowledge to reason and make these inferences.

This level of scene understanding is one of the grand challenges of artificial intelligence and would unlock exciting applications in autonomous robotic navigation and augmented reality (AR). In recent years, deep neural networks have shown great success in many supervised tasks, for example, object detection, classification and image segmentation. However, this supervised learning requires large amounts of labelled data that can be prohibitively expensive or impossible to obtain and does not capture the complete information present in a scene.

On the other hand, humans learn complex scene understanding without direct supervision for perception. My research is around self-supervised scene representation learning, developing algorithms that consume images of an environment and convert these into compact representations for use in downstream tasks such as AR and robotics without human labelled data. Primarily I'm focused on self-supervised inverse rendering, estimating a scene's shape, material properties and lighting from a small number of images.



JAMES GOODMAN

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BIOGRAPHY

James is interested in opponent modelling, theory of mind and strategic decision-making in multi-player games, and how statistical forward planning can be used in modern tabletop board-games (or other turn-based environments). With a constrained budget, how much time should an agent spend thinking about it's own plan versus thinking about what other players might be doing to get in the way? How does this balance vary across different games?

His other research interest is in using AI-playtesting as a tool for game-balancing and game-design, creating tools that are useful to real-world game designers.

James has picked up degrees in Chemistry, History, Mathematics, Business Administration and Machine Learning. After a career in Consultancy and IT Project Management he is now finally doing the research he always wanted to.

STATISTICAL FORWARD PLANNING IN MODERN TABLETOP GAMES

James is interested in opponent modelling, theory of mind and strategic communication in multi-player games, and how statistical forward planning can be used in modern tabletop board-games (or other turn-based environments).

With a constrained budget, how much time should an agent spend thinking about it's own plan versus thinking about what other players might be doing to get in the way. How does this balance vary across different games?

His secondary research interests are in using AI-playtesting as a tool for game-balancing and game-design.



JANET GIBBS

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Skills: Research design; Experience in a range of programming languages including Java, C#/ Unity, and physical computing with Arduino/ Processing.

BIOGRAPHY

Janet is working towards her PhD in Intelligent Games and Game Intelligence, building on earlier studies for her MSc in Cognitive Computing at Goldsmiths. Her work brings together cognitive science and philosophy of mind with games computing and HCI, to seek new ways of engaging with computer and VR games. Janet enjoys pushing the boundaries of technology. Her earlier career has encompassed the introduction of word processing and automated publishing to an international legal publishers and their typesetters. She also contributed to the building of a groundbreaking legal database, designed for the then new technologies of CD-ROM and online services.

MULTI-MODAL PERCEPTUAL FEEDBACK IN VIRTUAL REALITY – IS MORE ALWAYS BETTER?

The object of introducing haptic feedback to VR is to increase the player's sense of 'reality' by reproducing more closely the kind of 'real world' conditions portrayed in the VR experience. The use of different technologies for visual, auditory and haptic feedback encourages the idea that the modalities are separable. This makes it easy to suppose that 'adding haptics' will

necessarily improve the experience. However, real-world perception is almost invariably multi-modal. It is important to understand how "the interface between a person and their physical environment" functions holistically, if we are to generate a convincing "interface to a simulated environment".

Recent research has suggested that, if haptic feedback is introduced without due consideration of the holistic perceptual experience, then the sense of presence in the VR can be reduced rather than enhanced. Janet's initial experiments will seek to replicate part of this work, with additional conditions that will shed further light on the phenomenon described. Further empirical studies will build on this, seeking to understand better how and why adding feedback in one modality can enhance the overall experience, and when we are at risk of making things worse.



JOSHUA KRITZ

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Skills: Mathematic / Game Development/ Game Studies / Algorithms/ Education/ Artificial Intelligence/ Creative Problem Solving

BIOGRAPHY

Graduated in Applied Mathematics in computer science, however my love for games pushed me to dedicate myself for studying them. This led me to brave many areas of knowledge, such as: psychology, design, education, production and entrepreneurship. My work as a teacher let me develop many of these skills in practice, besides invoking a new perspective about the world.

On a personal level, I love new experiences that can teach me new knowledge and, most important, I am very open minded and easy to talk to! I believe discussion leads to enlightenment.

THE USE OF AI STRATEGY DATA IN REDEFINING MODERN TABLETOP GAME DESIGN

With the evolution of tabletop games, they have become much more complex than their traditional counterparts (chess, go), they now have hidden information, a higher variety of components, and uncertainty as a few examples. This complexity is what made them thrive in the current world, but this also makes the creation of such games more difficult. This research use AI players to investigate different game strategies which can be evaluated through a series of metrics. We aim to investigate how to use existing metrics for strategy and create new ones to assist game design. The proposed contribution is twofold: first, a tool that assists game designers in analyzing their game strategies; second, the development of new metrics for games focused on evaluating higher-level concepts such as player engagement and sellability. This will allow game designers to create better games and also assist players in achieving a better play experience.



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BIOGRAPHY

I'm a researcher interested in better understanding the challenges that developers experience in seeing to make increasingly accessible games. I also have experience as a games user researcher working directly in the games industry and my research is motivated by a desire to help enable developers to make increasingly inclusive games for players who have historically often been left out.

UNDERSTANDING BARRIERS TO ACCESSIBLE GAME DEVELOPMENT

My research has involved interviews with a large number of different game developers and players with disabilities and has helped reveal a number of key areas of difficulty as well as strategies that might help studios understand and overcome these challenges.



KARL CLARKE

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Skills: 3D Modelling, Virtual Reality, Social VR

BIOGRAPHY

Having originated from England, I relocated to the Middle East in 2006. Upon my return to England, I pursued higher education and obtained a Bachelor's degree followed by a Master's degree in Music Technology. During the COVID lockdowns, I embarked on a new venture in game development and virtual reality after being granted access to a VR headset. Engaging in immersive experiences and delving into the realm of Social VR, I began honing my skills in 3D modeling and development using Unity by creating Social VR Environments.

THE HUMAN IN THE AVATAR – HOW TRACKING TECHNOLOGIES COULD CHANGE THE WAY WE EMBODY AND INTERACT IN SOCIAL VIRTUAL REALITY APPLICATIONS

The Virtual Reality (VR) industry has seen rapid growth since the introduction of consumer-oriented VR Head Mounted Displays (HMDs) such as the Oculus Rift and the HTC Vive. However, these only inject the players head and hands into the virtual world leaving Inverse Kinematics (IK) to calculate the rest of the body. Additional trackers attached to the players limbs can offer a greater accuracy of lower body pose estimation and can open up new ways to interact with a game. This study aims to investigate the viability of new methods of interaction such as Facial and Eye tracking. Applications of this information could create mechanics based on body language to create immediate feedback for the player.



KEVIN DENAMGANAI

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Skills: Language Emergence and Grounding, Multi-Agent Deep Reinforcement Learning, Self-Play

BIOGRAPHY

After graduating as an Engineer from the Ecole Nationale Supérieure de l'Electronique et de ses Applications (ENSEA), France, with two double-degree diplomas, a MEng in Electrical Engineering and Information Science from the Osaka Prefecture University (OPU), Japan, and a MRes in Artificial Intelligence and Robotics from the Université de Cergy-Pontoise (UCP), France, Kevin Denamganai spent a year accumulating experience as a Robotics & Machine Learning freelancer. He is now putting those skills at use in the iGGI PhD program, that, among other things, gives him the opportunity to reunite with video games. Indeed, it was thanks to a keen interest towards video game creation that he started learning programming around 12.

EMERGENT LANGUAGES AS A TOOL FOR ARTIFICIAL THOUGHTS

His research interests are about everything psychology, neuroscience, AI, (deep) reinforcement/imitation learning, robotics, and natural/artificial language emergence and understanding as well as human-computer interfaces, challenging the question what are the necessary components of artificial agents to be able to converse with human-beings in an engaging manner and to be able to cooperate with them towards a pre-defined goal, e.g. clearing a level in a given video game.



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Skills: Machine Learning for Music, Symbolic Music Generation, Audio Programming, Expressive Rendering

BIOGRAPHY

Kyle is a composer, programmer and researcher who is designing AI music tools for game composers that don't step on composer's toes. He is also an IMDb accredited composer, a former business owner, and his most recent adventures have taken him cruising around the Mediterranean Sea as a session musician, as well as having him playing at a variety of festivals in the UK.

NEW DEEP LEARNING DRIVEN METHODS FOR IMPROVED EXPRESSIVE MUSIC GENERATION IN VIDEO GAMES.

Kyle's PhD research first looked to understand why music generation has not been widely adopted in video games – compared to visual procedural generation – when games as a longer medium have the potential to cause listener fatigue in players through repeated exposure to music. Through interviews with 11 professional composers, Kyle found that concerns are multifaceted and not limited only to: generative output quality being low and concerns for loss of authorship.

These interviews have helped to focus his further research into improving the expressive quality of generative music and MIDI mock-ups by developing an assumption free pipeline that only needs the pitch, ontime and duration of MIDI notes to create expressive performances.

In listening studies, his algorithm (CFE+P) has been shown to outperform the inexpressive baseline, a randomised baseline modelled after Logic X's Humanise function, and a score cue informed machine learning model called the Basis Mixer.

Now Kyle is working to use a Bidirectional Encoding Representation from Transformers (BERT) model to generate variations of musical layers for existing pieces in a way that does not step on composers toes and could add variety to game music after a set period of time in the game. He plans to later test both the generation and performance algorithms in a game play setting to evaluate quality and repetition, as well as potentially evaluate them with professional composers to prove their co-creative potential.



LAURA HELSBY

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Skills: Qualitative Research, Mental Health, Games and Wellbeing, Player Experience

BIOGRAPHY

Laura has been gaming since she was 5 years old and got her first Gameboy Colour. She achieved a BSc in Psychology from the University of York and a MSc in Foundations of Clinical Psychology from Newcastle University. Her research interests include all aspects of games for mental health, with a particular focus on how games might help improve people's wellbeing and how different types of games influence different types of players. She has a particular interest in qualitative research

HOW DOES PERSISTENT LOW MOOD AND GAMING INTERACT?

This project focuses on how people with persistent low mood play and experience games, and what this might mean for their wellbeing. So far, she has conducted one interview study asking people with low mood what they play and why, and one diary study investigating the 'in the moment' effects and motivations for gaming. Future plans involve making more direct measures of the impact of particular games on wellbeing, as well as looking further into the FPS and simulation genres to unpack what about these games might make them appealing to people with persistent low mood. This research has applications in game design and mental health research, as well as player experience more widely



LAUREN WINTER

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BIOGRAPHY

Lauren was introduced to gaming from an early age when they received a PlayStation One as a gift. From there, video games became a huge part of their life, exploring new worlds through the eyes of a vast array of characters. Following their undergraduate degree in Psychology with Sociology, they completed their MSc in Psychology Research Methods at the University of Nottingham. A fascination with looking for trends in data and creating complex spreadsheets in Excel led them to a job analysing student information in a school, where they also ran four Esports teams competing across three games. Their research interests primarily focus on player research in team-based PVP games and looking at players' awareness of each other in these environments.

NON-GAMEPLAY DESIGN FACTORS AFFECTING COOPERATIVE AND COMPETITIVE PRESENCE

Lauren's project will investigate the interaction between competitive and cooperative play, such as is found in team-based PVP environments. Simultaneous combinations of competitive and cooperative play are found in many high grossing games, such as Call of Duty and League of Legends. These games provide environments for players to play with and against teams

of both friends and strangers, and illicit social presence, a term used to indicate the awareness of others in the digital environment. Lauren's research will focus on two types of social presence: cooperative presence and competitive presence. Despite the popularity of these games, little is known about the juncture between the two and the effects they have on player experience, or what game design factors can be used to manipulate them.

Lauren's work will focus on identifying non-gameplay design factors that influence cooperative and competitive presence. Through the development of a bespoke game, created in Unity, Lauren will investigate how people work together and against each other. Does better cooperation lead to better competition and does better competition lead to better cooperation?



LUIZA STEPANYAN

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Skills: Applied game design and development, fast prototyping, player research, visual and graphic design

BIOGRAPHY

Luiza is a multidisciplinary researcher, game designer and developer interested in translating real world concepts into engaging game mechanics. She is passionate about creating games that can encourage an understanding of ourselves and the world we live in. Luiza is also an experienced visual artist and designer specialising in dark abstract art. She spends her free time developing atmospheric games and polishing old jam games. Catch her talk on Seriously Casual Games on the last day of the conference.

DESIGNING COOPERATIVE MULTIPLAYER GAMES FOR PREJUDICE REDUCTION

iGGi webpage: Luiza's research centers on how video games might be designed as interventions for prejudice reduction between conflicting groups and draws on theories of intergroup and cultural psychology.

Online multiplayer video games bring together people from all over the world, however they also have a reputation for toxicity. Increasing contact has been found to be one of the most effective methods for reducing prejudice, yet it must be done so under very specific conditions, as laid out by the Intergroup Contact Theory.

Luiza's PhD research will investigate how these conditions may be implemented through game design with a focus on cooperative multiplayer game mechanics, common goals, and equal status. Empirical research into how different designs affect prejudice between players will hopefully reveal a more accessible and long-lasting intervention option than traditional techniques.



LUKE FARRAR

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Skills: Computer Vision, AI, Machine Learning

BIOGRAPHY

Luke Farrar is an iGGi PhD student at The University of York undertaking research in Creature Animations. Luke's research focuses through his bachelor's and master's degrees were on applying machine learning to interesting and unique settings. In his bachelor's he focused on creating an application for individuals that suffered from cognitive impairments through the use of the "Microsoft HoloLens" and machine learning to allow those individuals to maintain a semblance of everyday life. In his postgraduate Luke focused on using machine learning to generalise high-fidelity scientific simulations to rapidly generate predictions for parameter combinations that had not yet been sampled in order to accelerate the production of new results. Before starting at iGGi Luke worked as a Data Analyst providing insight to businesses. Luke revels in all things AI, knowing that there is always more to learn and seeks to continually deepen his understanding around AI.

CREATURE ANIMATIONS

This project aims to leverage monocular video footage to generate detailed 3D meshes of creatures to extract a riggable skeleton. The ultimate goal

is to develop a system capable of generating animations from videos of these creatures. The process involves many approaches. First, the monocular video frames are processed using computer vision techniques to extract visual features and track the creatures' movements over time. Next, the captured data is used to reconstruct a 3D mesh representation of the creatures, allowing for a more detailed analysis of their shape and structure. Using this reconstructed mesh, the displacement of the creatures is measured per frame, enabling the estimation of their skeletal movements. By employing inverse kinematics or similar techniques, a 3D animation skeleton is then reverse engineered based on the measured displacements. Finally, this skeleton is utilized to generate animations that closely mimic the movements observed in the input video footage. The project will contribute to the field of computer graphics and animation by providing a novel approach to extracting skeletal information and generating animations of non-humanoid characters from monocular video data. Potential applications include realistic creature animations for films, games, and scientific visualization.



MADELEINE FRISTER

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Skills: UI/UX design, front-end development

BIOGRAPHY

Madeleine joined the iGGi programme in 2020, after obtaining a master's degree in psychology and cognitive neuroscience from the Friedrich Schiller University in Jena, Germany. Her PhD focuses on how visual characteristics influence gameplay and player experience. In 2021, she co-founded UX studio Vanilla Noir where she works as an independent designer and developer on website, app and game projects.

PERCEPTUAL DISTRACTION IN VIDEO GAMES AND ITS EFFECTS ON PLAYER EXPERIENCE

Video games rely heavily on central aspects of human information processing, including perception, attention, and memory. The human mind is severely limited in the amount of information it can process, and a key factor for successful information processing is resisting distraction. Consequently, most user experience guidelines recommend eliminating any unnecessary information to avoid cognitive overload. Yet, in the case of video games, the presence of task-irrelevant items does not seem to compromise player experience, considering that there is an abundance of popular video games that are very high in visual complexity. On the contrary, inducing demand in the form of perceptual distraction may even be desirable in order to introduce challenge which can in turn increase enjoyment. The current project aims to deepen our understanding of perceptual distraction and its effects on game difficulty and player experience, with a specific focus on perceptual similarity between target and distractor items.



MARKO TOT

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Skills: Game AI

BIOGRAPHY

I started my journey in video games when I got my first PC at the age of six, and at that point it was decided that I'm going to make a career out of it. So here I am, ~20 years later, a PhD. student at Queen Mary University of London, trying to make AI agents that can play games, and regularly spending too much time playing games under the excuse that it's all for 'research purpose'.

LOCAL FORWARD MODEL LEARNING

As a part of the iGGi programme and Game AI research group, I'm working on adapting Statistical Forward Planning methods for complex environments.

Statistical Forward Planning methods have proven to be effective in some simpler domains and, without requiring any prior learning, they provide a good out of the box AI algorithm. However, while these algorithms shine in certain games, they struggle to perform well in cases where the reward received from the game is sparse. In games where it takes a series of optimal actions to reach the goal, without any significant feedback from the environment in between, their performance drops significantly.

My research is centered on solving this problem through automatic sub-goal generation and utilisation of local learned forward models. Creation of the sub-goals could be used to simulate the feedback from the environment and give regular rewards to the agent even in sparse and complex environments.



MARTIN BALLA

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Skills: Game AI, Machine Learning, Reinforcement Learning, Deep Learning

BIOGRAPHY

Before starting his PhD Martin studied Computer Science at the University of Essex. His main interest is artificial intelligence and its application to all sort of problems ranging from computer vision to game AI. He likes spending his spare time with various activities which mainly involves reading, playing video games and skateboarding.

MULTI-TASK REINFORCEMENT LEARNING

Martin is interested in Reinforcement Learning agents that can adapt to changes in the reward function and/or changes in the environment. His current work focuses on learning Hierarchical RL policies end-to-end using SFs. Outside of his main research direction, Martin is involved with the Tabletop games framework (TAG), which is a collection of various tabletop games implemented with a common API with a focus on various game-playing agents (including RL). TAG brings various challenges to RL agents compared to search-based agents, such as complex action spaces, unique observation spaces (various embeddings), multi-agent dynamics with competitive and collaborative aspects, and lots of hidden information and stochasticity.



MAXIMILIAN CROISSANT

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BIOGRAPHY

Hi, I'm Maxi. I am a final year Computer Science PhD researcher with a unique background in psychology. I have a Bachelor's and Master's degree in Psychology/Cognitive Science from Germany and now research the intersection of human emotions and technology, specifically in the field of affective software.

EMOTION DESIGN: PROGRESSING AFFECTIVE INTERACTIVITY IN VIDEO GAMES

I'm developing models and experimental software revolving around emotional relationships and analyse it through machine learning techniques with the ultimate aim to enhance user experiences. My research targets the following components of developing and researching affective technology:

1. Affective Design: The design of intelligent systems that can understand, respond to, and influence human effect. This involves fundamental theoretical rethinking of affective computing techniques to deeply integrate contemporary psychology research into a robust and usable design system.

2. Software Development: The development of new and creative software to showcase and test new ways to engage with intelligent systems. This relates to affect-adaptive video games, emotional game agents, and even horror VR worlds that understands what people are afraid of.
3. Machine Learning Techniques: The application of modern ML and AI techniques to tackle some of the most salient problems in affective computing, namely emotion recognition, and emotion modelling.



MICHAEL JOHN SAIGER

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Skills: Applied Games, Design and Development, Player Research

BIOGRAPHY

Michael is a game design researcher whose interests reach into player experiences, evaluating engagement, and player retention. He has worked as an independent QA consultant, working across both games and web development on projects associated with Mattel, BBC and Channel 4. Michael graduated with a MPhil in Digital Health and Wellbeing from the University of Strathclyde and a BA (Hons) Game Design and Production Management from the Abertay University.

HOW DO WE ENGAGE CHILDREN AND YOUNG PEOPLE IN THE DESIGN AND DEVELOPMENT OF MENTAL HEALTH GAMES

Michael's research started out asking "how do we design games for young people to help with mental health problems?". Though this question has is the soul motivation of his research, he was unable to jump straight into developing games and instead questioned how research and industry approach the design of games for young people. A common approach is by involving end users in the design approach such as service design or participatory design. These 'user involvement' methods are seen as beneficial. It involves stakeholders in the design, implementation, and evaluation of a product. Plus, it has also

been used in applied games design, also for young people, but both pose different challenges than the default user involvement for functional software with adults. Because of these differences, there is little guidance on how to successfully deliver user involvement methods with young people in applied games design. Therefore, the goal of Michael's research is to investigate how these methods engage young people during design processes. He is exploring how facilitators of user involvement can modify their procedures to a) better engage young people, b) inform young people of applied domains/concepts (e.g. anxiety problems) and c) assess outcome quality of games produced.



MICHELANGELO CONSERVA

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Skills: Reinforcement Learning, Machine Learning, Statistics, Bayesian Inference

BIOGRAPHY

Michelangelo Conserva is a second year PhD student studying principled exploration strategies in reinforcement learning. He is particularly interested in randomized exploration and, more generally, Bayesian methods for reinforcement learning. He holds a BSc in Statistics, Economics and Finance from Sapienza, University of Rome and an MSc in Computational Statistics and Machine learning from University College of London.

PRINCIPLED EXPLORATION STRATEGIES FOR REINFORCEMENT LEARNING.

As a PhD student at Queen Mary University of London, Michelangelo aims to leverage Bayesian models to develop principled algorithms for reinforcement learning in the context of function approximations. The main challenge lies in finding a balance between computational costs and optimality. Evaluating such balance requires careful evaluation, which is currently lacking in reinforcement learning.



NATHAN HUGHES

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Skills: Mixed Methods, Questionnaires, Decision-Making

BIOGRAPHY

Nathan Hughes is a player experience researcher who focuses on how player make choices within open world games. His interest lies in how to apply psychological concepts such as goals and motivation to gameplay, and how to do so in useful and visual ways.

UNDERSTANDING SPECIFIC GAMING EXPERIENCES: THE CASE OF OPEN WORLD GAMES

Players in open world games can choose to do whatever they want whenever they want. But this means two players could play the same game, whilst interacting with entirely different content. They may share little to no overlap in what they do or experience in the game, as they are pursuing their own unique and personal goals. How then, can they have experienced ‘the same game’? This question is difficult to answer because it’s hard to observe decisions being made. But by combining gameplay data with explanatory data such as interviews, it’s possible to understand what players choose to do and why they chose to do it. This allows us to better understand how the decision-making process works, and how we can make sense of this in terms of player goals. In doing so, we can understand how players can have the same overarching experience of a game, whilst pursuing vastly different activities.



NATHAN JOHN

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BIOGRAPHY

After graduating with a MEng in Computer Science from the University of Bristol, Nathan joined the games industry as a programmer, working for Climax Studios, Gaming Corps and Freejam, before moving to a career as a general software engineer, while still developing indie games on the side. His experiences across a range of industries sparked a passion for testing, and left him wondering if there were was to improve the automated testing in game development.

DEBUGGING GAME AI USING ADVERSARIAL AGENTS

Borne from an experiment Nathan had performed training AIs to play his indie game WarpBall, in which he found the agents solved for exploits in the authored AI rather than playing the game well, his research project proposes a novel method for improving the quality of behaviour of human authored agents by pitting them against trained agents and observing what bad behaviours/exploits the trained agents reveal. Authored agents refer to AI agents whose actions are explicitly designed by programmers using traditional techniques such as Utility functions, Behaviour Trees and state machines; trained agents refer to agents whose behaviour is learned by playing many games against the authored agents.



NICK BALLOU

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Skills: digital trace data, open science, statistics, user research

BIOGRAPHY

Howdy! I'm a psychology researcher interested in two topics: how gaming affects wellbeing, and how we can reform the research ecosystem to be more trustworthy (a movement known as open science). I'm from the US, and have bachelor and master's degrees in linguistics, a topic that prepared me well for social science research, but whose use is now relegated to sharing language fun facts. In my free time, I play padel, go to Arsenal games, bake, read – and of course play games. At the time of writing, I'm playing Tears of the Kingdom and Griftlands.

THE BASIC NEEDS MODEL OF GAMES AND WELLBEING: UNTANGLING THE EFFECTS OF GAMES WITH BETTER SCIENCE

Researchers, policymakers, parents and players are all deeply concerned about one broad question: how do video games affect players? Despite decades of research, in most cases the best answer we have is "it depends".

In my PhD research, I first break down some of the methods limitations that have hindered our success. Using best practices, I then develop and test a new model of gaming and wellbeing, the Basic Needs in Games (BANG) model. BANG differentiates quantity of play, which is proposed to have only weak and indirect effects on wellbeing, and the need-satisfying and -frustrating quality of play, which is proposed to have more direct effects on players' wellbeing.

Some of my strengths as a researcher include:

- Combining survey data and behavioral data from games
- Rigorous open science practices: All data are openly available, hypotheses are preregistered where relevant, and analyses differentiate statistical significance and practical significance
- Causal modeling and theory, with its implications for statistical modeling



NICOLE LEVERMORE

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Skills: Python, Neuroscience

BIOGRAPHY

My academic background is within Neuroscience, having achieved BSc Neuroscience and Psychology, MSc Translational Neuroscience and currently completing MPhil Auditory Neuroscience. Outside of my research interests, I enjoy playing video games, hiking, playing the cello and learning various coding languages.

STUDYING COGNITION AND MENTAL HEALTH USING VIDEO GAMES

Email: Video games have enormous potential for research on cognition and mental health and previous research suggests that playing video games can improve visual attention and memory. In my project, I will use video games to perform basic research into a common psychiatric disorder (ADHD), paving the way for improved diagnosis, monitoring and therapy. ADHD is typically diagnosed in childhood and is characterised by failures of attentional state maintenance. This project involves using a cutting-edge neuroimaging technique (OPM-MEG) to investigate how subjects with and without ADHD switch between attentional states (for example, 'engagement' and 'flow') while playing a cognitively engaging video game.

The ultimate goal is to use video games to understand how mental health impacts people's ability to focus on cognitively demanding tasks and, potentially, to develop therapeutic intervention.



NIRIT BINYAMINI BEN-MEIR

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Skills: Interaction Design, Applied Games, Serious Games, More-Than-Human Interaction

BIOGRAPHY

Nirit Binyamini Ben-Meir is a designer/artist based in London. Her work explores the interconnection between society, technology and ecology. She is an Associate Lecturer at the Royal College of Art London, where she gained her MA in Information Experience Design. She has a professional background in visual communication and interaction design. She uses participatory installations, digital tools and responsive plants to create experiences for humans to interact with their biosphere. She combines ecological systems with technology to challenge human perception and provoke thought about bioethics, power relations, and the Anthropocene implications.

THE BIO-DIGITAL GARDEN AS HUMAN-COMPUTER-PLANT INTERACTION

Nirit's main research interests are around More-Than-Human Interactions and the integration of living organisms into digital interactions. She investigates how these hybrid interactions may help mediate relatable, sensory experiences with plants and influence people's attitudes towards ecological stewardship. She is developing the Bio-Digital Garden concept, which combines computational elements and living moss, a responsive plant that gives qualitative visual feedback to changes in its environment in real-time. Her exploration focuses on the potential of using human-computer-plant to identify current weak points in pro-environmental behaviour and care for non-human entities, as well as influence people's perceived accountability through tangible feedback, bridging time-scale gaps, and generating a sense of urgency.



Océane LISSILLOUR

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Skills: HCI, UX, Engagement in games, Cognitive psychology, Human Factors, Technological Innovation, Statistics

BIOGRAPHY

Born and raised in France's Celtic land Brittany, I started my journey with a Bachelor in psychology. I had the pleasure to discover the field of ergonomics during my bachelor's and ended up specialising in serious video games. I moved to Toulouse to do my dream MSc in technological innovation and cognitive psychology and worked in collaboration with researchers of the CLLE, a laboratory part of France's national research center, to further develop my knowledge of video games and engagement processes. I then went on to work in Aeronautics and I'm about to move to York for the first time.

EVALUATE THE USEFULNESS AND EFFECTIVENESS OF THE SCORE AS AN ELEMENT OF GAMIFICATION IN EDUCATIONAL SETTING

My research focuses on gamification in education which is the act of taking a non-gamified activity and applying techniques found in video games such as points. This technique is widely used but the psychological side of it has seldom been studied.

This thesis would aim to interrogate the usefulness of this technique and particularly of the score element. It aims to focus on educational settings since it is one of the fields where engagement is the most crucial. The use of gamification could provide a partial solution to the decline in learners' motivation and engagement the schooling system is facing today.



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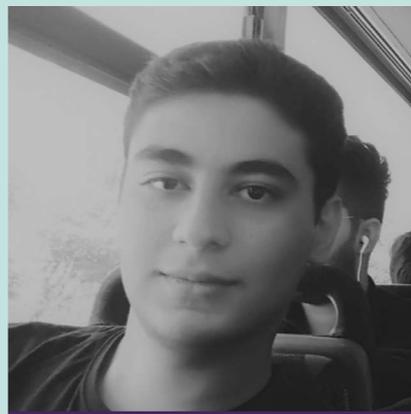
Skills: Software Development;

BIOGRAPHY

Following three years working in software development for a healthcare management firm, I fell in love with the world of Game AI research through the work started during an MSc in Computing. This, combined with a lifelong love of playing video-games and thinking about their design led to joining the iGGi programme in 2020. I live in London with my wife and young daughter (with a 2nd on the way at time of writing!) and when I am not writing about, thinking about, or playing games I can often be found either in the local climbing gym, or at the trying to keep up with my daughter at the playground.

VISUALISING AND EVALUATING GENERATIVE SPACES

My research focuses on automatic content generators for games and whether they can be made both more consistently predictable and controllable. At time of writing generative systems are exploding in popularity, but development of techniques for evaluating them and predicting their output is largely not keeping pace. This is where my research goals are targeted. I focus on developing techniques for visualising and evaluating the expected output from generative systems so that alternative generators can be usefully compared to each other. So far I have explored several alternative techniques, combining insights from game development practice with state-of-the-art algorithms. My latest paper, 'The Right Variety' was presented at the Foundations of Digital Games conference in April and I was delighted to receive an honourable mention for the work.



PEYMAN HOSSEINI

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Skills: Natural Language Processing, Sequence Analysis, Computer Vision, Network Analysis

BIOGRAPHY

Peyman is interested in using his computer science knowledge to support society's well-being. Raised in a family where almost everyone's work is somehow related to mathematics and its applications, he became passionate about algorithms and combinatorics from an early age. This prompted him to pursue an undergraduate degree in computer engineering with a focus on IT and AI. He also has been reading about psychology and sociology as his favourite avocation since college. This is one of the main motivations for him to join iGGi as he believes games are an excellent medium to help people in different ways (like improving their problem-solving and multi-tasking skills) and the PhD project he is involved in allows him to not only extract invaluable knowledge from the gamers' data that can help studios improve their decision making when making sequels or other games, but to also pursue his long-lasting interest in getting involved in projects that aim to analyze gamers data for the betterment of the society.

SENTIMENT ANALYSIS OF GAME REVIEWS

This project aims to dive deep into understanding the perception of the players and critics about the games of a game studio in detail, and to this end, strives to use (and improve) the state-of-the-art techniques in language modelling and Natural Language Processing to build systems that automatize the extraction of their invaluable views and feelings about the works of a game studio. The challenges, however, for developing such a system are immense. Foremost, building systems that are capable of handling and analyzing the nuances of a video game and the feelings the gamers develop towards different aspects of these games require specialized datasets that are currently lacking. Additionally, most current systems that analyze players' emotions use classical machine learning approaches, and in the age of big data, analyzing the massive source of available data requires algorithms capable of handling large amounts of data like RNNs and Attention Models. By overcoming these challenges and building an effective system for analyzing players' sentiments, we can help game studios to build games that are more immersive, influential, and enjoyable to play.



PHILIP SMITH

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Skills: I have experience in: Programming Languages – Java, C, C#, C++, Python, Verilog, Dart (Flutter), SQL, NoSQL
Software Packages – Visual Studio, Android Studio, GitHub, Pycharm, CLion, Figma, Firebase, Unity Engine

BIOGRAPHY

I was born and raised in Bermuda, a small island in the Atlantic Ocean with an approximate population of 65,000 people. I finished my undergraduate degree in Computer Science with a Specialist in Game Design at University of Toronto. For my Master's degree, I studied Computer Games Technology at City, University of London. My personal goal is to help expand the use of video games from purely recreational activities to viable avenues for aiding in real world problems.

BUILDING ENGAGEMENT IN A CLASSIFICATION DATA-ANALYSIS, CITIZEN SCIENCE VIDEO GAME USING SELF-DETERMINATION THEORY'S INTRINSIC AND EXTRINSIC MOTIVATORS

My research will be focusing on maximizing player engagement in gamified citizen science as a continuation of my Master's thesis. My project attempts to address the lack of sufficient volunteer engagement in gamified citizen science projects. The aim is to build an engaging citizen science video game based in classification data-analysis while strategically employing the values set by Self-Determination Theory. I have already built a prototype that I developed using the Unity Game Engine and an API developed by Massive Multiplayer Online Science. The intent of my research at iGGi is to expand upon the existing model. The goal is to demonstrate how tapping into a player's sense of relatedness and competence through an online platform and bolstering the audience through a mobile game version of the project can serve to expand prolonged engagement by volunteers in citizen science.



PRAKRITI NAYAK

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Skills: Player Experience, Applied Games, Neuroscience, Qualitative Analysis, Scientific Editing

BIOGRAPHY

Prakriti is a biologist at heart. She has always been interested in the intersection of technology and biological research. In her master's, she studied neuroscience and worked with large-scale imaging data and statistical modelling. Afterwards, she pursued a career in scientific editing. She sees gaming as a great platform to connect different fields like computational modelling and behaviour. Prakriti plans to develop a model of player uncertainty. This can enhance the gaming experience by setting the difficulty level enjoyable to each player and make games more accessible for people with limited cognitive capability. The project also has diagnostic applications.

PLAYER UNCERTAINTY IN NAVIGATION GAMES AND ITS APPLICATIONS

Treatment of cognitive impairment causing disorders such as Alzheimer's disease is challenging partly due to delay in diagnosis. Prakriti proposes developing a model of player behaviour in navigation-based games to detect early stages of cognitive impairment using data from the Sea Hero Quest project. She plans to do so by adapting a Bayesian ideal-observer model based on visual simultaneous localisation and mapping. The model will fit and predict a player's moment-by-moment movement decisions given the first-person view and the map of the game environment. This research has the potential to enhance gameplay experience by keeping the players engaged. Moreover, early diagnosis would lead to early treatment, thereby improving the quality of life for patients.



PRASAD SANDBHOR

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Skills: Serious Game Design, Design Research, Strategic Design and Management

BIOGRAPHY

Prasad is a serious game designer and researcher. He has designed games for education, healthcare, social safety, inclusivity, sustainability and science outreach over digital, tabletop and hybrid platforms. He is a part of the 'Play in Nature' initiative that crafts playful experiences to connect people with nature around them. Prasad brings 8 years of professional experience in the design and strategic management of B2C and B2B digital products and 4 years of teaching experience in game and UX design. He writes short stories in his native language, Marathi.

EXPLORING THE POTENTIAL OF GAMES AS TOOLS FOR SENSE-MAKING OF CLIMATE ACTION AMONG YOUNG ADULTS

Climate change is a wicked problem. It demands multiple solutions to operate at distinct levels and with diverse stakeholders. Research has established that for people to take action towards mitigating and adapting to climate change, they first need to be cognitively, behaviourally and emotionally engaged with it. Climate change games have been found impactful in engaging their players with various dimensions of the crisis.

Prasad's PhD explores the potential of climate change games in making sense of various actions that can be taken to mitigate and adapt to climate change. It focuses on games that are played in a group set-up as it enables sharing of personal anecdotes and dilemmas while creating a sense of togetherness. As a part of his first research study, he designed a roleplaying game called 'Climate Club' through iterative playtesting with experts in climate change and game design domains. Presently the game is being evaluated with young adult players.



REMO SASSO

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Skills: Reinforcement Learning, Natural Language Processing, Computer Vision

BIOGRAPHY

I hold a BSc and MSc in Artificial Intelligence at the University of Groningen (NL). During my undergraduate studies, I became captivated by reinforcement learning (RL) agents that learned superhuman gaming capabilities. This sparked my interest in pursuing this direction of AI research. For my thesis, I then successfully created an RL agent with human-level capabilities for the game Lines of Action. During my Master's, my interest shifted toward model-based RL algorithms. For my Master's thesis, I developed multi-task and transfer learning techniques for modern model-based algorithms, resulting in a publication in Transactions on Machine Learning Research. I am now pursuing a Ph.D. at Queen Mary University of London under the guidance of Dr Paulo Rauber, and am also a Machine Learning Engineer at xDNA.

SCALABLE AND EFFICIENT BAYESIAN ALGORITHMS FOR REINFORCEMENT LEARNING

My current research focuses on developing RL algorithms that are both scalable and sample-efficient. In particular, the algorithms are based on principled model-based Bayesian algorithms, and I prioritize preserving their core principles in the scalable versions. This is exemplified in my first paper published at International Conference on Machine Learning (ICML), where I successfully scaled the Posterior Sampling for RL algorithm while closely following its original formulation. This resulted in Posterior Sampling for Deep Reinforcement Learning, an algorithm competitive with other state-of-the-art algorithms in Atari games, labeled as a milestone in model-based RL research by one of the conference reviewers.



RORY DAVIDSON

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Skills: Qualitative research methods, cognitive psychology, Unity design

BIOGRAPHY

As the joke goes, there are 10 types of people in the world; those who understand binary, and those who do not. When I first came to York to study Computer Science, it was with the intention of being one of the former. But as I completed my undergraduate studies, I came to realize a more useful split is perhaps between those who understand *people* and those who do not, moving towards a Masters in psychology research and an interest in HCI, especially relating to games and motivation.

LEARNING AND STRATEGY ACQUISITION IN DIGITAL GAMES

The intuition that games may be potent educational tools has been around since the dawn of the industry, but putting that intuition into practise has proven easier said than done. In particular, while numerous examples of successful integrations of games and education exist, the core problem of *reliably* imparting useful educational goals without jeopardizing the motivation properties that make games appealing tools in the first place remains without clear answers, whether through modern methods like gamification or older approaches like "edutainment" gaming.

This study aims to ground these problems by first examining that initial underlying intuition - what makes learning within games different from learning in other contexts in the first place? Before we can reliably learn FROM games, we need to understand the precise mechanisms of learning IN them, by examining existing theories of learning, strategy, and motivation, and identifying how they might best be adapted for games specifically.



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Skills: Speculative, Experimental and Disruptive Design, Player Experience

BIOGRAPHY

I studied for my bachelor's and master's degrees in games design at Falmouth University and prior to entering the iGGi program, have more recently been teaching further and higher education courses in games development. I'm a user centred designer with a practical interest in disruptive, future-proof, and emergent design solutions and a theoretical interest in paradigms surrounding engagement and disposition towards play. I also maintain professional interests in pedagogy, affective psychology, applied games, ludic lexicology, and speculative design. As a player of games, my interests are normally agnostic. I'll happily engage with anyone in play, but I find First Person Shooter, MMO and Sandbox games particularly appealing. I also maintain an interest in Live-action roleplaying and martial hobbies such as HEMA and Airsoft.

WHAT ARE THE INSTRUMENTAL FACTORS IN INITIATING GROUP PLAY?

In game studies there are many different domains of play, but group play or multi-player represents a vibrant and growing domain of interaction. My project is concerned with the complicated and unexplored relationships involving players when choosing to play a game with others. Contemporary game design appears to utilise typology-

based methods to define and serve an audience, but an unexplained phenomenon within social dynamics influences the commencement of play.

As a user-centred designer, I care as much about the players I lose as the ones I engage. Imagine a social scenario where someone asks; "Shall we play a game?". This scenario is common and one I'm sure most people have experienced. But this proposal is disrupted when someone follows this question with; "What shall we play?". At this point, play rarely commences in a sympathetic and harmonic manner as individual motivations and factors hold sway over disposition towards engagement.

This phenomenon isn't exclusively motivational or behavioural, and there appears to be important social and intrinsic factors in effect. My project is concerned with identifying and analyzing these factors and in so doing, highlight opportunities to apply this research in practical, commercial, and theoretical contexts. I believe play brings people together and this philosophy underpins my line of enquiry.



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Skills: Deep Learning, Data Science, Reinforcement Learning

BIOGRAPHY

Ruizhe has bachelor degrees in Mathematics and Physics and a master's degree in Artificial Intelligence. After a short time as a consultant he decided to pursue research into what got him into AI in the first place: game agents. He enjoys games of all kinds, but strategy and RPG games occupy a sizeable portion of his collection.

DEVELOPING HUMAN-LIKE GAME AGENTS WITH A WIDE RANGE OF PLAY STYLES AND SKILL LEVELS

AI agents that perform with superhuman skill in increasingly complex games have appeared in recent years, but these agents are not always useful to game developers. Players within a game exhibit significant variance in their skill levels and play styles. Therefore, game agents with similar variance would better represent the player base. The research Ruizhe proposes will focus on three areas: measuring skill and play styles, developing game agents that mimic a range of human play styles and skill levels, and making these agents human-like. Upon successful completion, this research has will improve the game development process via automated playtesting and will enable the development of AI agents that are more engaging and interactive.



SAHAR MIRHADI

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Skills: Qualitative Research, Networking, Leadership

BIOGRAPHY

With 12 years of experience in sales and marketing, Sahar has embarked on a new and exciting journey exploring the intricacies of human behaviour and its intersection with games. Beyond her academic pursuits, Sahar is an accomplished Magic: The Gathering player, one of the founding members of the European Legacy Masters event series and runs a Youtube channel called the Legacy Gambit, bringing accessible onboarding content to eternal Magic: the Gathering formats. Additionally, she has a genuine ardour for professional wrestling.

HOW AND WHY CAN GAMING POSITIVELY AFFECT PLAYERS DURING DIFFICULT LIFE EXPERIENCES?

By combining an interdisciplinary approach from positive psychology, interactive media, and computer science, her research interests revolve around understanding the player experience and how games can positively affect players. She earned an MSc in Applied Positive Psychology and Coaching Psychology, which has allowed her to concentrate on how digital games can foster well-being, particularly during challenging periods.

Sahar's research focuses on digital gaming and how it can help people cope during difficult life experiences. Sahar has recently conducted an extensive content analysis of 130 players and

identified six categories (Challenge, Social Interaction, Character Interaction, Narrative, Environment, and Simulation of real-world activities) that encapsulate 34 game aspects that impact players' experiences with gaming during difficult times. Many of these game aspects reported both beneficial and detrimental effects. In addition, it was shown that playing video games can serve as a way to cope with issues like grief, job loss, and mental health concerns. It was also found that players employed emotion-focused and avoidant coping strategies, using games to feel supported, competent and encourage positive emotions in a period of uncertainty.

Currently, Sahar is exploring the connection between specific game aspects and coping strategies, exploring the role healthy escapism in games, and other contextual and psychological factors that may affect gaming behavior during challenging times.



SARAH MASTERS

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Skills: Indie Game Development, Game Design, Narrative Design, Illustration

BIOGRAPHY

Sarah is an indie game developer, writer and artist creating games designed to evoke emotional experiences. They have an MA in Indie Game Development from Falmouth University and are an active part of the games community, designing and developing deep and critical games. Game experiences impacted their inspirations and creativity from childhood, finding a particular interest in games that inspire reflection and change.

MAKING MEANINGFUL GAMES TO COMBAT CLIMATE NIHILISM

The project explores how to design and develop meaningful games for climate change issues, for potential climate change reflection, action and activism. An iterative design approach will explore player responses to purposefully developed digital play experiences. Establishing the game design strategies and tactics to evoke emotionally complex, thought-provoking and potentially transformative moments for players. Exploring experimental digital storytelling methods in-depth to establish the best approaches for games to combat climate nihilism.



SEBASTIAN BERNs

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BIOGRAPHY

Sebastian is a PhD researcher in generative deep learning with a background in visual communication. Before obtaining a master's degree in artificial intelligence, he worked several years as an independent graphic and type designer with a specialisation in web development. His work has been awarded national and international design prizes and has taken him around the globe, from Germany to Spain, Venezuela, México and Japan. Currently, Sebastian is a teaching fellow at Queen Mary University of London.

HIGH-FIDELITY DIVERSITY IN DATA-DRIVEN GENERATIVE SYSTEMS

We consider data-driven generative systems for the production of video game assets and artefacts for visual arts. These systems consist in a deep generative model that approximates a given data distribution. The model can be queried with a variety of search methods to find artefacts that satisfy the requirements of an application.

We quantify the limitations of such statistical models with respect to the diversity and the fidelity of artefacts they can represent and produce. For this, we study ways to adequately measure the different notions of diversity in the context of generative deep learning. We further research changes to generative modelling that can increase the diversity of a model's output and the fidelity of minority features.



SOKOL MURTURI

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Skills: Neural Networks, TensorFlow, Reinforcement Learning, Statistics, Programming: C#, C++, Java, JavaScript, HTML, Game Engines: Unity 3D, Unreal4

AI FOR GAME DESIGN: LEARNING FROM DESIGNERS

For my PhD I am investigating how AI can help developers by learning to generate content in a similar fashion to the developers themselves. I envision a framework based on reinforcement learning, where an AI can learn a design policy for some content domain (e.g., FPS maps or platformer levels) by observing human designers. The AI would learn to take particular design actions in certain kinds of content states. Recent research into reinforcement learning has shown it is a powerful framework for developing complex agent behaviours and I believe there is a lot of potential to apply this work to game design.

How would a human and artificial designer interact? Assume that an AI has learned to design a specific kind of content, such as a house, by observing human designers at work. A human designer could then partially develop some new content, and ask the AI to suggest some variations on it, with both AI and human iterating on the design in a mixed-initiative interaction. The AI could learn from feedback from both the human designer and playtesting. As human feedback may not produce enough data for effective learning, the AI could perhaps extend this with data from simulated playtests.

Game design decisions are often made with an expectation of how the player will react, and I could also look at how player models could be incorporated into the AI designer. In a reinforcement learning approach, the state could represent content+player, and the AI could learn to take design actions aimed a specific types of player. Developers could use this framework to develop content targeted at an individual player's style. Moreover, if the AI has learned something about how the human designer creates content, it can then be used live during the game to modify game elements in response to player interaction. Developers could set up modular levels, giving the AI the ability to adapt certain areas with content generated specifically to match the player.



STEPH CARTER

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Skills: User Experience and Evaluation, Mixed Methods Research, Game Design

BIOGRAPHY

Steph is a York graduate in psycholinguistics with years of experience in language teaching. They specialise in second language learning, human-computer interaction and gamification. Outside of their project, their research interests extend to accessibility in games, game design for children and young people and esports analytics.

GAMIFIED EXPERIMENTS IN SECOND LANGUAGE ACQUISITION RESEARCH

Gamification and the role of games have been embraced in education, particularly in Second Language Acquisition (SLA). A large amount of SLA research is informed by psycholinguistics findings when researching a person's second language (L2). However, there is little research on the potential impact of gamifying psycholinguistic experimental design. In addition, while player and learner engagement is well understood in second language learning and teaching, participant interest and engagement are highly controlled in psycholinguistic experiments to avoid confounding variables in the data. This not only limits the application of conclusions in real-world contexts, but also contributes to larger participant drop-offs in studies. It also fails to account for participant disengagement as a confound. This project investigates various game design elements and their interaction with participant engagement, behaviour and theoretical findings for psycholinguistic approaches to SLA. The findings can then be used to inform the design and development of psycholinguistic data collection tools with further benefits to cognitive research and language game development in the industry.



SUNNY THAICHAROEN

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Skills: Game data analytics, Esports strategy, Player research

BIOGRAPHY

Sunny is a passionate esports enthusiast, with a love of MOBA games. His background is in engineering and entrepreneurship, with a Master of Technology Entrepreneurship degree from University College London. He is the creator of YGOscope, a statistical game data platform for a competitive card game, Yu-Gi-Oh. Sunny is an avid player of competitive Dota in his spare time, and is also a keen theme park enthusiast. He is interested in modelling metagames of MOBAs through game data and player research, particularly how players adopt the most effective strategies when changes to the stable gameplay state occurs.

QUANTIFICATION OF ESPORT METAGAMES TO SUPPORT GAMEPLAY BALANCING AND DESIGN

The project focuses on how the META – most effective tactics available – of MOBA games shift during disruption (usually through gameplay updates) between states of ignorance and stability within the player space of these games, to deepen our understanding of how players adapt to the changes that these gameplay updates cause, and why. There is a large degree of variability of how new METAs develops, and currently there is little research on the meta and metagame front. Available research so far has been based on defining the phenomena and resulting effects of gameplay updates, but little modelling has been done to attempt bring these fragmented pieces of knowledge together and attempt to structure them. The study and structuring of this phenomena can be an ideal starting point in understanding how effective strategies develop not only in MOBAs or video games, but any other competitive games such as chess, trading card games or sports.



TAMSIN ISAAC

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Skills: HCI, Data Science, Player Experience, Game Design

BIOGRAPHY

Tamsin was always interested in how people interact with games and how playing games could help improve someone's well-being. She studied a Psychology BSc and an Advanced Psychology MSc at University of Plymouth where she investigated the differences watching games and playing games can have on improving one's psychological well-being. In her free time, Tamsin has taught herself about coding and game design which led to her goal to explore how psychology can be applied to the designs of games and not just to how players interact with games. In her spare time, Tamsin likes to bake, read, and play all sorts of video games.

DO MODELS OF DISENGAGEMENT OFFER USEFUL ACCOUNTS OF PLAYER BEHAVIOUR, AND CAN THEY BE USED TO IMPROVE GAME DESIGNS

Though there are disengagement models that focus on using technology, there are no disengagement models that focus exclusively on games. The aim of the research is to create a disengagement model that can be applied to limited timed events in games. Having a disengagement model that offers useful accounts of player behaviour will give a clear understanding of why and when players disengage with games. Surveying and interviewing players will see if the model is applicable to games. If so, it can be used to investigate how limited timed events affect disengagement and if their design can be improved to limit disengagement and improve reengagement. This research contributes to new studies into the relationship between disengagement and various aspects of games. This will not only help make games more engaging for players but will lead to a better understanding of player experience.



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Skills: Game design and development, HCI Research, Report writing, Qualitative data collection and analysis, User experience, Narrative studies, Character development.

BIOGRAPHY

Cross disciplinary researcher who holds a BA (hons) in English and Media Studies, and MSc by research in Interactive Media.

Studies and analyses player experience and engagement in order to collect qualitative and quantitative data.

Predominantly interested in the potential for developing intentional uncanny audiovisual aesthetics and gameplay in video games.

DEVELOPING UNCANNY 'OTHERS' FOR IMMERSIVE ENVIRONMENTS: A STUDY OF SPEECH AND MOVEMENT IN ANIMATED ROBOTIC AND ALIEN CHARACTERS IN VIDEO GAMES

The research aims to determine what makes a digital robotic or alien character uncanny through an in depth study of animation and speech. The intention is to make a development toolkit to aid the process of developing these digital uncanny others. The literature review will explore the vast quantity of relevant material within the fields of HCI, HRI and game theory. The research study will be approached using a range of well developed research methods used within HCI, HRI and game theory. These will include industry interviews and player experience surveys, the development of game prototypes analysed using qualitative data collection and Reflective Thematic Analysis, and the subsequent development of a toolkit to be tested in a workshop environment with game developers. This research and toolkit aims to be a useful asset to the character development process, whilst benefiting the relationship between the development process and player experience.



TARA COLLINGWOODE-WILLIAMS

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Skills: Unity Development, C#, Character Animation

BIOGRAPHY

Tara has always had a keen interest in immersing people into creative worlds. Whether through theatre, creative writing and now virtual 3D environments. She graduated with a Bsc in Creative Computing, which introduced her into the world of Virtual Reality. Over the years, her interdisciplinary profile has enabled her to work as a Technical Support and Researcher with many organisations in relation to her research, such as UCL, Great Ormond Street Hospital, George Mason Serious Games Institute in the United States where she also co-lectured an XR Games Module and, more recently as a Lecturer in Goldsmiths University teaching Unity-based XR experience development.

THE PSYCHOLOGICAL IMPACT OF CONFIGURATION OF SELF-REPRESENTATION IMMERSIVE VIRTUAL REALITY

With this rise in demand for Head-Mounted Displays (HMDs), so is the need to create Embodied Shared Virtual Environments (ESVE) where users may experience authentic social interactions. Tara's research presents an exploratory examination of Embodiment – meaning the subjective feeling of owning a virtual representation in VR, and specifically Consistency in Embodiment – relating to how we prioritize and synchronise objective attributes of embodiment (i.e avatar representation) in order to create ESVEs which supports more intuitive social interaction. The goal is to understand how different technical setups could have a psychological impact on participants' experiences in ESVE. This research hopes to inform the development of successful social interaction in a variety of applications in VR, ranging from training to gaming.



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Skills: Machine Learning, Generative AI, Creative Computing, Creative AI, Data Science

BIOGRAPHY

Terence Broad is an artist and researcher working in London. He is a Senior Lecturer at the UAL Creative Computing Institute and is currently completing a PhD at Goldsmiths. His art and research have been presented internationally: at conferences and journals such as SIGGRAPH, Leonardo, NeurIPS, EvoMUSART, and ICCV; and museums such as The Whitney Museum of American Art, Garage Museum of Contemporary Art, Ars Electronica, The Barbican and The Whitechapel Gallery. In 2019 He won the Grand Prize in the ICCV Computer Vision Art Gallery and has regularly served on the Jury for SIGGRAPH. His work is in the city of Geneva's contemporary art collection.

EXPANDING THE GENERATIVE SPACE: DATA-FREE TECHNIQUES FOR ACTIVE DIVERGENCE WITH GENERATIVE NEURAL NETWORKS

Generative AI has come on in strides in recent years. Achieving human level of qualities of generation in many different domains, like text, music and image generation. This has upended entire industries. Spawning a wave of new companies developing services around generative models. The common requirement for all these models is that they need massive amounts of training data. Data that is usually scraped from the internet without the permission of the original creators. This has led to a large backlash against generative AI from communities of artists, musicians, authors and actors. Whose creative output is usually taken without consent to train these generative systems.

The research in my thesis has been to find ways of performing generation with neural networks that goes beyond the imitation of data. Using techniques that do not need training data, I have developed several new methods for training, fine-tuning and manipulating pre-trained models. These methods allow for the active divergence from training data, to generate new and original outcomes without relying on aping existing intellectual property.



TOM WELLS

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Skills: Perception, psychophysics and neuroscience

BIOGRAPHY

Tom has an interest in niche alternative and indie games which evoke strong emotions and are narratively immersive. He studied Experimental Psychology as an undergraduate in Oxford, specialising in conscious brightness perception in specific optical pigments. His Masters was in Computational Neuroscience, Cognition and AI from Nottingham, and focused on Computer Vision (specifically facial recognition) and Visual Attention. He enjoys heavy metal, strength sports and literature.

USING MACHINE LEARNING TO ESCAPE THE UNCANNY VALLEY

With the rise of digital art, Uncanny Valley has emerged from an esoteric robotics concept into an infectious memetic phenomenon, with specific memes such as 'Uncanny/Canny Mr. Incredible', or more generally uncanny faces being used as reaction images for humor. Critics and players will now refer to specific media being 'Uncanny' rather than using more general words as 'off-putting', demonstrating uncanniness cementing itself in the public consciousness as examples increasingly abound; ergo digital artists should be aware of evoking the uncanny even with modern rendering technology, as audiences become increasingly discerning of the Uncanny.

This is most pertinent in videogames, where rendering is performed in real-time, meaning rendering constraints must be implemented. This potentially confines characters to the Uncanny Valley, as it may not be possible to increase graphical fidelity, thus artists may be left to either accept the uncanny or demaster their work (both undesirable options).

This project aims to learn about the Uncanny Valley pertaining to modern skin rendering techniques, using artificial intelligence (specifically GANs) to directly map skin rendering parameters onto user assessments of uncanniness and realism. This can then be reverse engineered to provide automated tools for generatively rendering realistic non-uncanny skin, and predicting audience responses to skin realism, expediting QA testing. The primary experimental stage is to generate a face database with photorealistic skin to be assessed using psychometrics by participants. This is additionally one of few studies looking into the novel phenomena of training AI's to generate human-oriented psychologically salient content.



TIMEA FARKAS

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Skills: User Research

BIOGRAPHY

Timea is a researcher striving to understand how people engage with technologies – broadly defined – in their everyday lives, and how new technologies can enhance people’s experiences of play, creative expression, and beyond. She has always been drawn to learning new things, with a background ranging from creative arts through games to science, which allows her to apply an interdisciplinary outlook towards research. She holds an MA in Sonic Arts from the University of Sheffield and has graduated with a First Class (Hons) degree in music composition and technology with a special award for outstanding achievement and collaboration.

HOW DO BOARD GAME PLAYERS INTERACT WITH EMBEDDED TECHNOLOGIES?

This research project centres around understanding board game players’ relationship with the immersive capabilities of hybrid board games – board games with a digital component – through finding novel interactions which strengthen the sensory elements of tabletop games. By focusing on physical board game pieces as alternative input devices to touch screens, the goal is to explore the design space of analogue-digital hybrids with a player-centric approach.



TOBY BEST

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Skills: C# Python Java Unity Game Engine Dungeon Mastering for TTRPGs Gaming

BIOGRAPHY

Toby has always held video games as an integral part of his livelihood, ever since catching his first Pokémon on the Game Boy Color. The ever-developing evolution of technology, from the humble NES and R.O.B. preventing the video game market crash in 1983, to the Wii’s motion controls, to augmented and virtual reality today, has been a key inspiration, and one of the reasons why he studied Mathematical Computation at University College London. He also has a keen interest in tabletop roleplaying games, such as Dungeons and Dragons and Pathfinder. His research interests involve the potential of combining roleplaying games’ collective storytelling and interactive narrative with the power of artificial intelligence and deep learning.

GAME MASTER AI FOR TABLETOP GAMES

Artificial Intelligence is the field of creating digital agents capable of decision-making and rational thought to fulfil a core goal or aspect. For tabletop and video games, an implemented AI would attempt to ‘solve’ the game by finding optimal winning strategies.

However, tabletop role-playing games (TTRPGs) are driven by the power of collective storytelling and interactive narrative, as opposed to set rules, and therefore have a more open-ended goal – maximising player enjoyment for all participants. This involves a Game Master (GM) player as both narrator and referee, controlling the non-playable characters (NPCs) and the campaign behind the screen, whereas players usually control one player character (PC) each to interact with the world. There is no ‘failure’ state compared to traditional games, as campaigns can continue until players lose interest or the narrative is ‘complete’; even all PCs dying (known as a total party kill) can drive the narrative in a new direction.

This project aims to study and piece together the different elements that would go into a Game Master AI, building on current AI agents such as Director AIs, and studying the implications of such developments for players and game designers alike. For example, whether it could replicate the playing experiences of a human GM as a replacement, or enhance the experience by working with a human GM.



YIZHAO JIN

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BIOGRAPHY

Currently a student at Queen Mary University of London (QMUL), I have delved deep into the realms of artificial intelligence and game design. With a passion for understanding the complexities behind real-time strategy (RTS) games and their dynamic, unpredictable nature, I have committed myself to contribute novel insights to this domain.

Research:

My primary research area is Hierarchical Reinforcement Learning (HRL) for Real-Time Strategy (RTS) games. RTS games, known for their intricate mechanics and vast decision spaces, present a formidable challenge for traditional AI approaches. By employing HRL, I aim to develop agents that can not only understand the multi-layered tactics and strategies of these games but also learn to adapt to ever-changing game scenarios efficiently.

The main objectives of my research are:

1. Better Generalization: To create agents that can seamlessly transition between different RTS games or various maps within the same game without extensive retraining. This involves understanding common strategic threads across multiple game domains.
2. Efficient Training: RTS games are inherently time-consuming due to their vast decision spaces and prolonged

gameplay. My research seeks ways to optimize the training process, ensuring that AI agents can learn faster and with fewer computational resources.

HIERARCHICAL REINFORCEMENT LEARNING (HRL) FOR REAL-TIME STRATEGY (RTS) GAMES

Specializing in Hierarchical Reinforcement Learning (HRL) applied to Real-Time Strategy (RTS) games, my research at Queen Mary University of London (QMUL) tackles the complex decision-making challenges presented by these dynamic gaming environments. The core objectives of my study are twofold:

1. Enhanced Generalization: RTS games possess diverse landscapes and strategies, necessitating agents that can navigate through multiple games or varied maps without exhaustive retraining. My research delves into identifying and leveraging strategic patterns that are common across different RTS domains, aiming to produce agents with superior adaptability.
2. Optimized Training Efficiency: Given the expansive decision spaces in RTS games, training AI agents can be computationally intensive and time-consuming. My work focuses on streamlining this training process, seeking methodologies that enable faster learning while consuming fewer resources.



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Itch: <https://pyrofouc.itch.io>

Skills: Procedural Content Generation, Automated Game Design, Artificial Intelligence, Narrative Design

BIOGRAPHY

Younès Rabii is a PhD researcher in game AI and the award-winning designer of games such as SUPER IS HOT, Cannelé & Nomnom and NEUROCRACY 2049. Their work has been previously exhibited in the French embassies and international festivals. Their current research is focused on building generative AI techniques that can help designers create new forms of play and storytelling. Younès' work has two main goals:

- resist the systemic oppression within the AI and game industries
- create games that can surprise players and designers alike.

KEEPING PLAYERS ON THEIR TOES: TOWARDS LIVE AUTOMATED GAME DESIGN

Younès' research goal is to bring to video games some of the most interesting properties of roleplaying games: their ability to trust every player with building a part of the game, and their ability to generate both new narrative and gameplay on the fly. Younès is working both on the AI techniques needed to allow that, and how to design the social spaces around those games in a way that won't hurt players or abuse creators. During their PhD, Younès will likely design a prototype in that new genre, counting among the first games to contain a form of Live Automated Game Design.



YU-JHEN HSU

Queen Mary University of London

Supervisor(s): Diego Perez Liebana, Raluca Gaina

Email: y.hsu@qmul.ac.uk

LinkedIn: <https://www.linkedin.com/in/yujhenhsu>

Skills: Game AI, Programming

BIOGRAPHY

I have always been interested in automation specifically within strategy games, starting from civilization 5. I have a background in Artificial Intelligence with a Master of Science degree from Queen Mary, University of London, with a focus on Game AI, Computer Vision and Machine Learning/Deep Learning. My research interests involve Game AI improvement in real-time turned-based games with the help of data science techniques.

AUTHORIAL CONTROL OF MONTE CARLO TREE SEARCH AGENTS IN GAMES

This project has two goals. Firstly, to improve the performance of MCTS (Monte Carlo Search Tree) implementation. Secondly, the goal is focused on building an AI agent that is able to win the game but also provide feedback information/data about its decisions to the players and designers. In order to achieve the goal, the plan of the project is to use different data science skills to enable the game AI agent to understand the utility of different actions and decrease the time needed for making decisions. The data collected can also help the game AI agent explain its behaviours, hence provided useful information/data for its users and designers.



ZOË O'SHEA

Goldsmiths University of London

Supervisor(s): Prof. Jonathan Freeman, Prof. Richard Bartle and Dr Sylvia Pan

Email: z.oshea@gold.ac.uk

iGGI webpage: <https://iggi.org.uk/people/zo%C3%AB-o%E2%80%99shea>

Twitter: @meowmentai

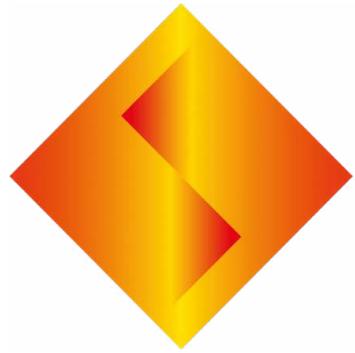
Skills: Game Design, Player Psychology, XR and Immersive Technology

BIOGRAPHY

Zoë O'Shea is an Irish freelance games designer and artist, working on her thesis in game design and player psychology. Her previous qualifications include 3D Generalism, and an MA in Digital Game Design and Theory. She is endlessly curious about the meaning and value that technology can bring to the world, exploring the human experience as a core principle of her work. She firmly believes in the importance of creating a more joyful and inclusive world.

TEND & BEFRIEND: STRESS RESPONSE IN DIGITAL GAMES

An exploration of game design and player psychology, focusing on an alternative theory of Stress Response, "Tend & Befriend Theory". Tend & Befriend offers insight into the rising popularity of "cozy" games which emphasise social connectivity, customisation and relaxing play.



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iGGi ALUMNI

iGGi ALUMNI

Here is to our iGGi Alumni! Congratulations to those who are new on the list and who have passed their viva! And to those who have submitted but have yet to defend their thesis: good luck!

FROM OUR 2014 COHORT

Athansios Kokkinakis	University of York
Christian Guckelsberger	Queen Mary University of London
Daniel Berio	Goldsmiths, University of London
David Gundry	University of York
Joe Cutting	University of York
Joseph Walton-Rivers	University of Essex
Memo Akten	Goldsmiths, University of London
Mihail Morosan	University of Essex
Piers Williams	University of Essex
Tom Cole	Goldsmiths, University of London

FROM OUR 2015 COHORT

Chris Madge	Queen Mary University of London
Dino Ratcliffe	Queen Mary University of London
Jen Beeston	University of York
Sha Li (Lisa)	University of York

FROM OUR 2016 COHORT

Henrik Siljebråt	Goldsmiths, University of London
Carlos Gonzalez Diaz	University of York
Cristina Guerreo Romero	Queen Mary University of London
Raluca Gaina	Queen Mary University of London
Shringi Kumari	University of York
Thryn Henderson	University of York

FROM OUR 2017 COHORT

Daniel Hernandez	University of York
Joe Hesketh	University of York
Charles Ringer	University of York
Georgiana (Cristina) Dobre	Goldsmiths University of London
Cristiana Pacheco	Queen Mary University of London
Ivan Bravi	Queen Mary, University of London
Myat Aung	University of York
Valerio Bonometti	University of York

FROM OUR 2018 COHORT

Oliver Scholten	University of York
Ryan Spick	University of York
Evelyn Tan	University of York
Ozan Vardal	University of York
Nathan Hughes	University of York
Nuria Peña Perez	Queen Mary University of London
Mathew Whitby	University of York

FROM OUR 2019 COHORT

Elena Gordon-Petrovskaya	University of York
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iGGi CONFERENCE FOREWORD

This year, the iGGi Conference takes place at Queen Mary University of London, as always, showcasing the iGGi researchers' exciting work and latest developments in Games Research. The iGGi Con 2023 introduces our new (and also our last ever) September cohort, connects researchers in the field, and provides a networking platform for the Games Industry and Academia. You can look forward to iGGi researchers presenting their work via talks, posters, panel discussions, demos, and workshops, and to many informal conversation opportunities (e.g., during the Mini Expo, poster sessions or over lunch).

We hope that all the above, alongside our as always exciting selection of invited Keynote speakers, will turn the 2023 edition of the iGGi conference into a most enjoyable event for you.

The 2023 iGGi Conference Committee



**iGGi Con 2023 – sponsored by
Sony Interactive Entertainment**

KEYNOTE SPEAKERS



VANESSA VOLZ

Vanessa Volz is an AI researcher at *modl.ai* (Copenhagen, Denmark), with focus in computational intelligence in games. She received her PhD in 2019 from TU Dortmund University, Germany, for her work on surrogate-assisted evolutionary algorithms applied to game optimisation.

She holds B.Sc. degrees in Information Systems and in Computer Science from WWU Münster, Germany. She received an M.Sc. with distinction in Advanced Computing: Machine Learning, Data Mining and High Performance Computing from University of Bristol, UK, in 2014. Her current research focus is on employing surrogate-assisted evolutionary algorithms to obtain balance and robustness in systems with interacting human and artificial agents, especially in the context of games.

ESTABLISHING TRUST IN AI-BASED TOOLS FOR GAME DEVELOPMENT

AI-based tools to support the game development process have long been a topic in Game AI research, with popular publications in testing, churn prediction, asset, level and even game generation. However, the adaptation of these techniques from the games industry has been hesitant at best: The small-scale and simplified examples researchers use to demonstrate their work understandably only seldom convince the industry to risk investing in AI tools.

In this talk, I will speak about my experience establishing trust in AI-based tools to support creative processes in game development. Having worked on this topic in both industry and academia, I will address issues ranging from establishing a common language and explaining AI behaviour to issuing performance guarantees via benchmarking and theoretical analysis.



ALEENA CHIA

Aleena Chia is a Lecturer in Media, Communications and Cultural Studies at Goldsmiths, University of London. She uses ethnographic and textual approaches to research creativity and innovation practices in game development and computational wellness. Her research on games investigates the passionate work of hobbyists and automation of creative labour through computational techniques. Her work on wellness examines disconnection from social media and lucid dreaming as a form of biohacking. In 2022, Dr Chia co-

edited a special issue on Politicizing Agency in Digital Play after Humanism in *Convergence*, the edited collection *Reckoning with Social Media* (Rowman and Littlefield), and co-authored the multigraph *Technopharmacology* (University of Minnesota Press / Meson Press). Her work is published in *Television and New Media*, *Internet Policy Review*, *Critical Studies in Media Communication*, *Journal of Fandom Studies*, and *American Behavioral Scientist*, among others. Before joining Goldsmiths, Aleena was a tenure track assistant professor at Simon Fraser University, postdoctoral researcher at the Academy of Finland's Centre of Excellence in Game Culture Studies, and PhD intern at Microsoft Research New England.

AUTOMATION AND INEQUALITY IN VIDEOGAME PRODUCTION

Recent advances in AI techniques for generating and manipulating text, images and other media cast creative industries as the last stand against automation and technological unemployment. Some experts and commentators reassure the public that generative AI can only produce novelty within set parameters and that true creativity is achievable only through

the conduit of human consciousness – where personhood channels experience into expression. This way of thinking emphasises 'complementarity', where automated systems augment instead of replace human creativity. Yet, a growing number of complementary tasks seem to draw on creative workers' capacities for living and feeling not to innovate or even supervise, but to iterate on machinic outputs. Automated forms of videogame production must be maintained by workers who use embodied and tacit knowledge to prompt content and bridge processes that are hard to codify and compute. Unlike AI art practices that prioritise co-creation with humans, industrial practices require humans to complement AI systems in routine and repetitive ways. Automation may be stratifying creativity into roles that extol some workers as persons while exploiting other workers as apparatuses – compounding existing race, class, and gender stratification in the games industry and threatening to undo the sector's efforts towards equity, diversity, and inclusion. Drawing on humanities research on creative labour, this talk urges game researchers to consider how automation tools might be shaped around human values to build more inclusive and equitable communities.



JOE CUTTING

Joe Cutting is a Lecturer in Human-Computer Interaction in the Department of Computer Science at the University of York, UK. He has a BSc in Computer Science and an MSc in Cognitive Science

from the University of Birmingham and completed an iGGi PhD at the University of York in 2019. Much of his research is in the area of the effects of playing video games on outcomes such as learning, cognitive abilities, wellbeing and behaviour change. This includes new psychological theories of how learning happens in video games and how game play can affect mental health, as well as studies on how game play can prevent cognitive decline in older people. He is also creating applied games to address current issues in education such as student wellbeing and teacher recruitment.

Before becoming an academic, Joe enjoyed a varied career which included working as an interactive producer for the London Science Museum and founding his own digital startup company in the area of applied games.

ADVENTURES IN GAME ATTENTION RESEARCH: FROM MEASURING EXPERIENCE TO MODERATING MENTAL HEALTH

Academic papers often tell a simple story, in which the authors' hypotheses about a problem magically turn out to be correct and the results are then eagerly received by a grateful world. Real life and real research are much messier and often involve failure, confusion, and rejection. In this keynote, I tell the story of my research on game attention from its beginnings as a fallback from my main PhD topic to how it became my main research theme. My game attention research story has several twists and turns, but eventually led to high impact, award winning papers that contributed to me being offered a permanent academic job. Along the way I discovered new insights into how attention can be used to measure game experience, improve learning in educational games and may be a crucial aspect in the connection between games and mental health.

CONFERENCE PROGRAMME

DAY 1 – WEDNESDAY 13 SEPTEMBER 2023:

Graduate Centre, Mile End Campus, Queen Mary University of London

09.00	Registration opens with Coffee	Foyer
09.30	Posters: Years 2–3 (09:30 to 10:00) Years 4+ (10:00 to 10:30) Game Demos: From all year groups (09:30 to 10:30)	GC 114 (1st Floor)
10.30	Welcome: iGGi Director Peter Cowling and iGGi Chair Paul Cairns	Peston Lecture Theatre
10.45	Intro: Laurissa Tokarchuk Keynote 1: Vanessa Volz Establishing Trust in AI-based Tools for Game Development.	Peston Lecture Theatre
11.30	Buzz Talks – Year 2 (Chair: Laurissa Tokarchuk)	
11.45	Narrative Design (Chair: Stephanie Carter) <ul style="list-style-type: none"> Using the Tools of the Present to explore the past through digital interactive narrative design: Amy Smith, Florence Smith-Nicholls, Sahar Mirhadi, Sunny Thaicharoen and Callum Deery A Survey of the Uncanny Valley: Tom Wells 	
12.30	Lunch Game Demos: From all year groups (in parallel with lunch)	Foyer GC 114 (1st Floor)
13.30	Buzz Talks – Year 1 (Chair: Jeremy Gow)	Peston Lecture Theatre

13.45	Machine Learning (Chair: George Long) <ul style="list-style-type: none"> How can ML be used for better VR interactions? A socio-technical perspective: Carlos Gonzalez Diaz Using Neural Rendering inside Game Engines to increase Photo Realism: Evgenii Kashin 	Peston Lecture Theatre
14.30	Coffee Break	Foyer
15.00	iGGi Knowledge Exchange: (Chair: Susanne Binder, Jozef Kulik) <ul style="list-style-type: none"> Creative Assembly + Dominik Jeurissen Department for Education + Michael Saiger Laika + Madeleine Frister InstaDeep + Marko Tot 	Peston Lecture Theatre
16.00	Engaging the Next Generation: Designing Games for Younger Audiences. Michael Saiger and Stephanie Carter ; followed by Kyle Worrall	
16.45	Coffee break and Poster session	Foyer
17.15	Intro: Jeremy Gow Keynote 2: Aleena Chia Automation and Inequality in Videogame Production.	Peston Lecture Theatre
18.00	Closing remarks: Jeremy Gow, Laurissa Tokarchuk	Peston Lecture Theatre
18.15	Drinks reception from 18:15 to 19:00	Foyer

DAY 2 – THURSDAY 14 SEPTEMBER 2022:
 Graduate Centre, Mile End Campus, Queen Mary University of London

09.30	Coffee	Foyer	
09.30	Workshops (in parallel) <ul style="list-style-type: none"> 1. Introduction to Practical Procedural Audio in Automatonism 2. EcoCritical, EcoAction, EcoPunk: Play to Envision and Experience Alternate Climate Futures 3. How to be a Good Dungeon Master 4. Game (Not) Over: why should I care about failure in my game? 	GC 202 GC 204 GC 203 GC 201	
11.15	Coffee break	1st Floor	
11.45	Buzz Talks – Year 4+ (Chair: Jeremy Gow)	Peston Lecture Theatre	
12.00	User Accessibility and Psychology (Chair: Nick Ballou) <ul style="list-style-type: none"> Better Dead than a Damsel: Gender Representation and Player Churn: Lauren Winter and Sarah Masters Encouraging Accessible Processes in the Games Industry: Josef Kulik The Curious Case of Coping: Game Aspects and Life Experiences: Sahar Mirhadi 	Peston Lecture Theatre	Industry Mini Expo running in parallel Location: 1st Floor Graduate Centre
13.00	Lunch	Foyer	

14.00	Buzz Talks – Year 3 (Chair: Laurissa Tokarchuk)	Peston Lecture Theatre	Industry Mini Expo running in parallel Location: 1st Floor Graduate Centre
14.15	AI Design Tools (Chair: Francesca Foffano) <ul style="list-style-type: none"> I Want to Win! Discovering Loopholes and using practical game theory to break games: Marko Tot AI Tools for boardgame design: James Goodman 	Peston Lecture Theatre	
15.00	Serious Games: <ul style="list-style-type: none"> Exploring the Potential of Games as Tools for Making Sense of Climate Action: Prasad Sandbhor Seriously Casual Games: Designing a Casual Game about Genocide: Luiza Stepanyan 	Peston Lecture Theatre	
15.45	Coffee break	1st Floor	
16.15	Intro: Paul Cairns Keynote 3: Joe Cutting Adventures in game attention research: from measuring experience to moderating mental health	Peston Lecture Theatre	
17.00	Closing Remarks: Jeremy Gow, Laurissa Tokarchuk	Peston Lecture Theatre	

ACCESSIBILITY INFORMATION

The iGGi Conference 2023 is being held in the Graduate Centre, Mile End Campus, Queen Mary University of London.

For people with limited mobility, the building has step free-access and lifts. The main talks, keynotes and panels will take in the Peston Lecture Theatre; the poster session and food buffets will be located in the foyer (Ground Floor level); the game demos (13 Sep), the mini expo (14 Sep), some workshops, and the luggage room and quiet room will be located on the 1st and 2nd Floor of the building. If you have any accessibility requirements, please follow this link for more detailed information about the building and the spaces therein:

<https://www.accessible.co.uk/queen-mary-university-of-london/mile-end/access-guides/graduate-centre>

There is an accessible toilet on the Ground Floor and another on the 4th Floor. Further to this, there are female standard toilets facilities on the 1st Floor, the 3rd Floor and the 5th Floor. There are male standard toilet facilities on the 2nd Floor, the 4th Floor and the 6th Floor.

A quiet room has been provided on site (GC 103). There is a sign on the door of the room and it is marked on the map provided at Registration.

Food provided for the conference includes vegetarian, vegan, gluten-free options and also caters for other dietary requirements we are aware of.

The accessibility contact for the conference is Susanne Binder. If you need any further information or need any assistance, please talk to her and/or ask at the event Reception.

CONFERENCE COMMITTEE

General Chairs	Laurissa Tokarchuk, Jeremy Gow
Programme Chair	James Goodman
Industry Chair	Jozef Kulik
Website/Marketing Chair	Nirit Binyamini Ben-Meir
Social Media/Marketing Chair	Lauren Winter
Post Chair	Peyman Hosseini
Local Chairs	Yu-Jhen Hsu, Peyman Hosseini, Nirit Binyamini Ben-Meir
Showreel	Michael Saiger, Charline Foch
General Management and Industry Liaison	Susanne Binder

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 www.iggi2023.org