Daniel J. Finnegan, EngD.

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Please note that my website will always contain the most up-to-date CV

Research Interests

Spatial perception within virtual worlds primarily studied through the use of head mounted displays;

Multi-sensory perception applications to human centred computing and virtual reality;

Spatial audio interaction–binaural games, audio interfaces;

Serious Games/Games for a Change;

Employment

Assistant Professor (Lecturer) — Cardiff University
May 2019 - Present

I'm currently an Assistant Professor in the School of Computer Science & Informatics at Cardiff University. My projects investigate spatial perception in virtual reality (VR).

Research Associate — University of Bath
October 2016 - April 2019

I was a postdoc in the CAMERA research centre at the University of Bath. I explored problems with spatial perception in virtual reality, and design interventions to mitigate these problems.

Teaching

Cardiff University:

- CM1202: Developing Quality Software
- CM2101: Human Computer Interaction
- CMT206: Human Centric Computing

University of Bath:

- CM50267 Software Technologies for Data Science
- CM10227 & CM10228 Principles of Programming

Entrepreneur

Co-Director — Echo Games
October 2018 - Present

I have founded a Community Interest Company (CIC) with colleagues at the University of Bath (UoB) and Bath Spa University (BSU). Our manifesto is to develop games for social change while nurturing talent in students enrolled in UoB and BSU. Our goals are to develop innovative gaming experiences with academic output.

Education

EngD in Digital Entertainment, September 2017
University of Bath, UK;
Title: Compensating for Distance Compression in Virtual Audiovisual Environments;
Advisors: Prof. Eamonn O'Neill, Dr Michael Proulx;
Examiners: Prof. Stephen Payne, Dr Betty Mohler;
http://users.cs.cf.ac.uk/FinneganD/documents/Daniel_J._Finnegan-EngD-Thesis.pdf

BSc. in Computer Science, June 2012
University College Dublin, Ireland;
Title: Object Detection and Tracking in Images and Point Clouds;
GPA: 3.83 / 4.0;

Publications (Peer reviewed)

ACM CHI Conference → *Top tier conference in Computer Science*

Interactive Feedforward for Improving Performance and Maintaining Intrinsic Motivation in VR Exergaming
Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems;
http://dx.doi.org/10.1145/3173574.3173982

Compensating for Distance Compression in Audiovisual Virtual Environments Using Incongruence
CHI '16: Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems;
http://dx.doi.org/10.1145/2858036.2858065

ECCV → *Top Tier conference in Computer Science*

HandMap: Robust Hand Pose Estimation via Intermediate Dense Guidance Map Supervision
ECCV 2018: Proceedings of the 15th European Conference on Computer Vision, To Appear;

CHI PLAY → *Second Tier conference in Computer Science*

Agonistic Games: Multiperspective and Unsettling Games for a Social Change
CHI PLAY 18 Extended Abstracts
http://dx.doi.org/10.1145/3270316.3270594

Reindeer & Wolves: Exploring Sensory Deprivation in Multiplayer Digital Bodily Play
CHI PLAY '14 Proceedings of the First ACM SIGCHI Annual Symposium on Computer-Human Interaction in Play;
http://dx.doi.org/10.1145/2658537.2661309

Workshops

An Approach to Reducing Distance Compression in Audiovisual Virtual Environments
2017 IEEE 3rd VR Workshop on Sonic Interactions for Virtual Environments (SIVE);
http://dx.doi.org/10.1109/SIVE.2017.7901607

Grants

Heritage Dot Bursary, 2019;
£175;
Full conference delegate fees waived to present at the Heritage Dot conference at the University of Lincoln
http://heritagedot.org/

University of Bath Researcher Development Fund, 2016;
£1000;
Hosted a 1-day seminar on Games Research across Academia and Industry
`https://www.camera.ac.uk/achievement-unlocked-03-july-2017/`

University of Bath Public Engagement Fund, 2016;
£500;
Co-organized Bath's first ever Human Library event
`http://humanlibrary.org/`

Peer Review

Conference Peer Reviewer
ACM CHI Conference;
ACM IMWUT;

Journal Peer Review
IEEE Transactions on Human Machine Systems;
PLOS ONE;
Electronics and Telecommunications Research Institute (ETRI);

Awards

Recognising Excellence Scheme, November 2018;
Merit Payment for Exceptional Performance;
Awarded by the Faculty of Science at the University of Bath;

Best Accessible Game, November 2014;
Audio Defence: Zombie Arena;
Awarded by TIGA;

Distinguished Project, June 2014;
Reindeer & Wolves
Awarded by Dr. Floyd Mueller;
UBIComp Summer School (UBISS);

Supervision

Undergraduate Computer Science 2018/19
Supervising 4 students; topics covering games for a change, spatial audio interfaces for artistic performance, and mixed reality interaction for strategic planning

MSc Computer Science 2017/18
Supervised 5 MSc students to completion.
All received high 2.1 scores for their projects

Undergraduate Computer Science 2017/18
Supervised 3rd year student for their Individual Project. They received a 1st and have continued the project under my supervision into their final year 2018/19.

Undergraduate Psychology (Interns) 2017/18
I supervised 3 psychology undergraduate students who worked with me for their placement year as research assistants. All projects in VR: topics covering gender differences in motion sickness experience, learning in virtual classrooms, and VR exergames. All have chosen to continue their projects under my supervision for their dissertations.

MSc Computer Science 2016/17
Supervised a student developing a real time binaural renderer in C++. Received a 2.1

Administration

I organised the monthly departmental seminar series for the department of computer science at Bath from 2016-2017. I also organised the internal conference for the Centre

for Digital Entertainment in June 2017, acting as co-chair and papers chair.

Invited Lectures

University of Bath, October 2018;
Guest Lecture on CM50276 Humans & Intelligent Machines (MSc): Anthropomorphic Representations of AI;

University of Bath, October 2018;
Guest Lecture on CM20216 Human Computer Interaction (Undergraduate): Designing Auditory Interaction for HCI;

Cardiff University Brain Research Imaging Centre (CUBRIC), May 2018;
Invited lecture on Using LaTeX for Open Science;
`https://sciprogramming.wordpress.com/schedule/`

Pint of Science, May 2018;
Invited public talk on Spatial Perception in VR;
`https://pintofscience.co.uk/event/super-computers-and-ai-who-is-ruling-who`

University of Bath, February 2018;
Guest lecture on Games for a Purpose titled: Games (Beyond Games);

University of Bath, October 2017;
Guest lecture on auditory user interface design titled: Auditory Interfaces;

Audio Engineering Society, February 2015;
56th Conference: Audio for Games;
60 minute talk on design of virtual, audio only worlds;
Conference Report:
`http://www.aes.org/events/reports/56thConference.pdf#page=5`

Bath Spa University, November 2016;
Guest Lecture on Game Narrative Design
90 minute lecture on game design and narratives through soundscapes;

Notable Projects

Endless Blitz and Umschlagplatz '43
Games for a Social Change
Platform: Desktop (Unity), Desktop (Web)
Release date: October 2018

I have developed 2 serious games title Endless Blitz and Umschlagplatz '43. Both games were developed with the intention of encouraging political reflection, primarily under the concept of agonism. Endless Blitz pits 2 players against each other in an endless scenario of the bombing of the Ruhr area in Germany. The theme of agonism is reflected in the bomber's role of destruction and carnage to gain 'points' in the game at the expense of harming human beings while in the evacuation officer's role, the player must make difficult decisions regarding which civilians to rescue as time is limited. In Umschlagplatz '43, 4 players discuss their lives while they wait at the *Umschlagplatz* for trains bound for concentration camps in the second world war. Only one player will escape the camp; the game involves the exchange of information, giving players the opportunity to deceive one another and save themselves, condemning the others.

Both games were exhibited at the Ruhr Museum in November 2018. They were also inducted into the 2018 CHI PLAY exhibition in Melbourne, Australia.

Dungeon Escape
Multiplayer VR Experience
Exhibited: Multiple Dates in 2016 and 2017

Platform: Windows

Dungeon Escape is a multiplayer virtual reality experience where players escape from a dungeon while an invisible monster hunts them down. One player wears the headset while another carries a physical device that acts as a torch to light up the dungeon. Both players are embodied in a single avatar in the virtual environment and must cooperate to escape. This project explored cooperative play with the need to coordinate actions in a stressful, horrifying environment. The game has been on display at events such as the Cheltenham Science Festival 2016 and Bath Taps into Science 2017.

Audio Defence: Zombie Arena
Binaural first-person shooter game
Platform: iPhone, iPad
Release date: October 2014

As a member of the core development team, throughout the project I directly impacted the design, structure, and development of the game, leading to a critically acclaimed 3D aural experience. With a small team of 2 central developers and a strict budget we delivered the product on schedule. The game was well received by the press, and was awarded 'Best Accessible Game' at the 2014 TIGA awards in London.

Hall of Mirrors
Farmleigh Gallery, Dublin, Ireland
Exhibition: Autumn 2011

As part of the Clarity Centre for Sensor Web Technologies at Dublin City University, I worked alongside Cleary-Connolly (`http://www.connolly-cleary.com/Home/About_Us.html`) to produce a gallery installation. The installation consisted of two projects; the first was a homemade head mounted display housing a smartphone. I built custom software to interface with the phone's camera, applying filters to the camera's live stream exploring the effect of prisms and inverted vision on our proprioceptive and vestibular systems. The second project involved a wall projector and Kinect motion tracking depth camera. Visitors were tracked in real time while their skeleton was projected on to the wall as a constellation of dots. After leaving the capture area, the dots would dissipate into the constellation, symbolising our own flow through the vastness of space.

3D Audio Displays
Low-latency binaural audio renderer
Platform: Unity, OSX

I built a custom binaural rendering plug-in for the Unity3D game engine. The engine is deployed directly into Unity, requiring no extra programming by the application developer. It enables custom binaural rendering based off of individual HRTF data; a set of filters which capture how we hear audio differently from person to person. Using my plug-in, application developers can deliver a personalized audio experience for different individuals instead of using a generic dataset. It provides a clean, high level application programming interface (API), and fully encapsulates all audio processing. The project code is available from `https://github.com/Ps2Fino/Unity-Audio-Plugin`.