Post Title: PhD Studentship in Audio-visual fidelity of virtual agents in VR
Anticipated Start Date: September 2021
Location: Trinity College Dublin
Closing Date: 30th June 2021
Apply: https://forms.gle/EFGF5nwo8QvPwR1p8

Why ADAPT?

- **Contribute** to the ADAPT research agenda that pioneers and combines research in AI driven technologies: Natural Language Processing, Video/Text/Image/Speech/Audio processing, digital engagement & HCI, semantic modeling, personalisation, privacy & data governance.
- **Work** with our interdisciplinary team of leading experts from the complementary fields of, Social Sciences, Communications, Commerce/Fintech, Ethics, Law, Health, Environment and Sustainability.
- **Leverage our success.** ADAPT's researchers have signed 43 collaborative research projects, 52 licence agreements and oversee 16 active commercialisation funds and 52 commercialisation awards. ADAPT has won 40 competitive EU research projects and obtained €18.5 million in non-exchequer non-commercial funding. Additionally, six spinout companies have been formed. ADAPT's researchers have produced over 1,500 journal and conference publications and nearly 100 PhD students have been trained.

As an ADAPT funded PhD researcher you will have access to a network of 85 global experts and over 250 staff as well as a wide multi-disciplinary ecosystem across 8 leading Irish universities. We can influence and inform your work, share our networks and collaborate with you to increase your impact, and accelerate your career opportunities. Specifically we offer:

1. Opportunity to build your profile at international conferences and global events.

2. A solid career pathway through formalised training & development, expert one-on-one supervision and exposure to top specialists.
3. A Fully funded, 4 year PhD postgraduate studentship which includes a stipend of (€18,500 per annum - non taxed), along with equipment, annual travel funding
4. Funding for annual student fees

Context

Virtual humans and avatars are increasingly important tools for remote communication and telepresence using virtual and augmented reality. The perception of realism and co-presence in virtual and augmented reality environment is influenced by numerous factors, including the accurate rendering and animation of virtual humans, and the accurate matching of environmental lighting. However, the perceptual evaluation of the influence of accurate spatial audio and the matching of environmental acoustics on factors such as co-presence and behaviour such as conversation is often overlooked. This project will evaluate the relative importance of both audio and visual fidelity on the integration of virtual characters in virtual and augmented reality environments. In particular, the project will investigate the relative weighting of increasing accuracy in these two modalities on behaviour and the perception of realism and co-presence. The perceptual evaluation of different factors such as the matching of environmental acoustics and lighting using varying degrees of accuracy will be investigated, with the goal of reducing computational complexity while maintaining an effective perceptual illusion.

The successful student will be supervised by Dr. Rachel McDonnell (TCD - https://www.scss.tcd.ie/Rachel.McDonnell/) in collaboration with Dr. Enda Bates (TCD - Sigmedia Group - https://www.tcd.ie/research/profiles/?profile=ebates). The student will join the ADAPT team at TCD, and will be part of the Digital Enhanced Engagement Strand within ADAPT. The student will also join the Graphics, Vision and Visualisation group (https://isg.cs.tcd.ie/) at Trinity College Dublin, the only group of its kind in Ireland. The group publishes regularly in leading Graphics and Vision venues and conducts leading work on Computer Animation, Perceptually Adaptive Graphics, Volumetric Video, Light Field Imaging, etc .

From this PhD you will gain skills and knowledge in creating virtual reality experiments using computer graphics techniques; spatial audio and virtual acoustics; quantitative research design; statistical analysis techniques; project management skills; research communication skills; statistical/interface programming experience.

The successful student will have the opportunity to explore industry as well as academic career paths, based on their desired direction. The group has a lot of connections in the VFX, Gaming, and Animation industries.

- An overview of the research challenge with a focus on the core societal objective and the

outputs and impact you hope the research will deliver? How does it make the world better?
- On completion of this project, what will be the anticipated key learning outcomes and developmental achievements for the researcher?
- What potential career pathways will the researcher be equipped to go from this studentship/employment (eg industry, academia etc).

Minimum qualifications:

- Primary Degree or equivalent in computer science, electronic engineering, cognitive science, or psychology.

Preferred skills:

- Experiment design
- Statistical Analysis
- Knowledge of computer graphics/virtual reality
- Programming in Unity or Unreal Engine or similar
- Spatial Audio

Application Process

Each application should only consist of

1. Detailed curriculum vitae, including – if applicable – relevant publications;
2. Transcripts of degrees,
3. The name and email contacts of two academic referees,
4. A cover letter/letter of introduction (max. 1000 words). In the letter, applicants should include the following details:
    a. An explanation of your interest in the research to be conducted and why you believe they are suitable for the position.
    b. Details of your final year undergraduate project (if applicable)
    c. Details of your MSc project (if applicable)
    d. Details of any relevant modules previously taken, at undergraduate and/or Master level.
    e. Details of any relevant work experience (if applicable).

Diversity

ADAPT is committed to achieving better diversity and gender representation at all levels of the organisation, across leadership, academic, operations, research staff and studentship levels. ADAPT is committed to the continued development of employment policies, procedures and practices that promote gender equality. On that basis we encourage and welcome talented people from all backgrounds to join ADAPT.

About the ADAPT Centre

ADAPT is the world-leading SFI research centre for AI Driven Digital Content Technology hosted by Trinity College Dublin. ADAPT's partner institutions include Dublin City University, University College Dublin, Technological University Dublin, Maynooth University, Munster Technological University, Athlone Institute of Technology, and the National University of Ireland Galway. ADAPT's research vision is to pioneer new forms of proactive, scalable, and integrated AI-driven Digital Content Technology that empower individuals and society to engage in digital experiences with control, inclusion, and accountability with the long term goal of a balanced digital society by 2030. ADAPT is pioneering new Human Centric AI techniques and technologies including personalisation, natural language processing, data analytics, intelligent machine translation, human-computer interaction, as well as setting the standards for data governance, privacy and ethics for digital content.

Our Research Vision

Governments and civil society are starting to recognise the need for urgent and concerted action to address the societal impact of the accelerating pace of digital content technologies and the AI techniques that underpin them. ADAPT provides an ambitious, ground-breaking, integrated research programme that assembles three interlocking Strands that together are capable of addressing this challenge. Each of these complementary and reinforcing research Strands takes one of the different perspectives on the provision of personalised, immersive, multimodal digital engagement, i.e. the individual's experience and control of the engagement, the algorithms underlying digital content processing, and the balanced governance by enterprise and societal stakeholders.

Digitally Enhanced Engagement Strand

From the individual perspective, research within this Strand will deliver proactive agency techniques that sense, understand and proactively serve the needs of individual users to deliver relevant, contextualised and immersive multimodal experiences which also offer them meaningful control over the machine agency delivering those experiences.

Digital Content Transformation Strand

From the algorithmic perspective, new machine learning techniques will both enable more users to engage meaningfully with the increasing volumes of content globally in a more measurably effective manner, while ensuring the widest linguistic and cultural inclusion. It will enhance effective, robust integrated machine learning algorithms needed to provide multimodal content experiences with new levels of accuracy, multilingualism and explainability.

Transparent Digital Governance Strand

From the enterprise and societal perspective, new structured knowledge frameworks and associated practices for AI data governance will be required to balance the needs and values of individuals, organisations and society when it comes to rich digital experiences. This requires the advancement of research in the areas of data ethics, data quality, data protection, data value, data integration, and multi-stakeholder governance models.r