R&D in Virtual Production: Discovery Pilots Call

BRIEF FOR CREATIVE AND DIGITAL COMPANIES WORKING IN VIRTUAL PRODUCTION

Contents

About StoryFutures

StoryFutures exists to fuel innovation in storytelling through virtual and immersive technologies, new production methods, and innovative formats and business models. We bring together leading innovators with academic experts to develop cutting-edge ideas that capitalise on the massive opportunity for innovation and growth created by new content creation tools. To date we have founded over 125 industry-academic collaborations, building a vital source of innovation for our digital media industries.

1. The Virtual Production R&D Discovery Programme

StoryFutures is excited to announce a new opportunity for early-stage R&D collaborations that focus on Virtual Production technologies and methods.

We are looking for creative and digital companies already working in Virtual Production, or those with strong potential to expand into this area. Successful projects will benefit from £8,000 in cash (split between the company and their academic partner) and in-kind support and expertise.

Virtual Production (VP) is becoming a ubiquitous methodology for the achievement of high-quality film, television and media productions. VP and in camera visual effects (ICVFX) offers efficiencies and enhancements for both live action (production) and visual effects (post-production). It capitalises on technology from digital games development and delivers in real time, stunning, photorealistic or imaginative sets, environments and audience experiences. VP opens up a huge opportunity for cross-over of competencies, processes and methods between TV, film, games and immersive.

The Virtual Production R&D Discovery Pilot programme offers SMEs a chance to spend time developing ideas that help realise the massive potential of these technologies for creative, technology and business innovation.

We are looking to build relationships for long-term R&D collaborations in response to growing industry need and increasing focus in public policy in supporting and funding this area of innovation.

The opportunity is open to creative and digital companies in the Gateway Cluster and Greater London (see map on page 4). We welcome expressions of interest in response to our academic expertise briefs. These range from innovation in lens and audio technologies, to new creative workflows, to the use of AI for characters and environments, to new methods for acting in Virtual production stages.

The deadline to express interest is **5 June 2022**. The pilots will run during 20 June – early October 2022. Companies will retain IP from the projects and benefit from academic expertise and seed funding.

Programme Team
Fiona Kilkelly – Head of Immersive
Peter Richardson – Head of Virtual Production
Sol Rogers – Creative Technology Consultant
Kristina Glushkova – Innovation and Knowledge Exchange Lead
Hannah Wills – R&D Producer
Academic Partners (see Section 4)

Alongside expert guidance from the programme team, including Head of Immersive Fiona Kilkelly and CEO of Magnopos Sol Rogers, each project will

receive £8,000, of which £4,000 is cash funding going to the company, and £4,000 of research support time for their academic partner.

The projects will:

- Focus on early-stage concepts for innovative, creative, risky ideas that have potential to move the Virtual Production sector forward – whether in technology terms, creative or acting methods, business models or audience engagement - or a combination of these;

- Develop new relationships and partnerships between SMEs, academic researchers, StoryFutures and its partners, to build foundations for future work; and

- Deliver an early stage "paper concept" alongside a short report including a plan for further development and sources of funding.

Eligibility: The opportunity is for creative and/or digital companies defined as SMEs (Small to Medium Enterprises) based in the Gateway Cluster and Greater London, with under 250 employees and less than EUR 50m in turnover. We are looking for SMEs who currently work or are interested in Virtual Production technologies and In Camera Visual Effects for Film and TV. Some of these include: Film and TV production companies, games developers, Immersive specialist companies, VFX and Post production companies who are seeking to work in ICVFX, technology providers with VP driven solutions and related areas.

Our remit is to support growth in the Gateway Cluster and Greater London region. Companies applying from Greater London will be asked to demonstrate a willingness to collaborate and invest in the Cluster region. Examples of such commitments include hiring cluster-based subcontractors/freelancers, delivering workshops for cluster-based organisations, or offering support in other ways.

2. What is on offer?

Company participants will benefit from:

1. A chance to work on an exciting R&D partnership to develop new ideas;

2. Input from academic experts of 10 days over the course of the project along with support from StoryFutures and its experts;

3. £4,000 to support the time of a company to work on the collaboration (and further £4,000 towards the project for the academic collaborator);

4. New IP for new ideas, products, technology and content developed by the SME in the project, with the ability to commercially exploit this IP[1];

5. A new partnership opportunity and a foundation for future collaborations and funding applications.

Please note that the company £4,000 bursary must be spent on staff time and cannot be used for equipment or other purposes.

Company commitment is expected as follows:

1. Contribute around 10 days of your time to the collaboration, and to be available for online conversations and meetings regularly;

2. Provide in-kind contribution equivalent to a minimum of £2,000 (e.g. additional staff time at commercial rates, IP, facilities or value of equipment acquired or used on the project); and

3. Run an online workshop with students or a masterclass aimed at local SMEs (we will discuss the best focus/topic/timing with selected SMEs).

3. R&D Topic Areas

The topics below are based on our academic expertise and priority areas for StoryFutures.

We welcome SMEs to express interest in up to 3 of these areas. We will shortlist SMEs for different areas based on potential match of interest and expertise.

1. One exception to this is where the academic expert advises on audience research methodology and data collection/analysis in which case the academic institution will keep IP to the audience data/methodology with the right for the SME to exploit this IP.

Shortlisted companies will meet the academic experts at a Sandpit Event on 9 June 2022 to discuss initial ideas. Following the sandpit, collaborators will submit a short application describing the idea they'd like to develop further.

Final funding decisions will consider:

1. Academic and company match
2. Timeline and deliverables
3. Project potential to generate new IP in the area of Virtual Production; and
4. Identify and develop ideas for closing skills gaps in VP through innovative methods, programmes or applications

Projects can take many forms and may involve early-stage / paper prototyping, exploratory experiments, creative and/or audience engagement aspects, research and market analysis work, workflows and new methodologies.

Ideas may focus on game engine optimisation for volume, on set VP engineering, production supervision, novel image acquisition technologies, performance for MoCap and VP, colour science, AI driven Metahumans, asset optimisation and virtual art department.

Virtual Production Discovery Pilot Topics

1. Workflow challenges: developing tools to improve the accessibility of virtual production

Armando Garcia, Lecturer and Programme Director, Department of Media Arts, Royal Holloway, University of London.

Virtual Production workflows can be tremendously complex and require immense backend expertise. With VP being the future of the creative/film and TV production industries, Armando Garcia is keen to investigate how VP tools can be streamlined to meet the needs of artists and production teams who are emerging into what can feel a dauntingly complex workflow. Armando is interested in the development of a set of tools; they could be plug-ins for Unreal or onboarding/offboarding data/guides to essentially 'smooth out the edges' and allow entry level artists and production teams the opportunity to develop innovative and creative responses to the technology without being overwhelmed by its complexity.

With Royal Holloway soon to host one of a handful of education-based VP walls in the UK, this offers an opportunity to develop a pedagogical framework which could reach out to partners in the cluster area, offering these tools to other Education, Heritage and Arts institutions in a way which feeds collaboration and fertile thinking in a reactionary, relevant and not overtly commercial manner. At

this 'blue sky' stage, Armando is keen to develop a project which focuses on accessibility, innovation, artistic excellence and collaboration.

Armando has a background as an artist and educator in fine art, filmmaking and 3D worldbuilding in Unreal and high end and experimental asset creation/photogrammetry. He has taught Nuke and VFX Tracking/Compositing workflows and is fascinated by the myriad opportunities which VP offers. He has worked with some of the cluster area's leading VP companies and is interested in 'blue sky' thinking in an attempt to 'smooth out the edges'.

2. Actor training for new technologies: developing a toolkit for onboarding actors into virtual production and Mo Cap environments

Dr Will Shüler and Prof Jen Parker-Starbuck, Department of Drama, Theatre and Dance, Royal Holloway, University of London.

One of the great advantages of VP is the efficiencies it provides for live action production. Actors will have had little to no experience in these new ways of working. Knowing how the production will run, what the roles on this kind of set are, and technical specifications to inform the acting could all contribute to efficiencies and optimal performance. Actor training which demystifies VP could enable a broader, more diverse actor pool prepared to thrive in this new medium.

This project will focus on developing a toolkit/training for onboarding actors onto VP and Mo Cap sets and productions, allowing them to 'translate' their existing stage and screen acting skills into VP. Working with a company with experience in VP, the research partners are keen to explore what is important for actors to know and develop from the industry's perspective. This would also offer a company the opportunity to begin working experimentally with actors newly aware of this medium, creating a better understanding of human-computer interaction and methodologies for creative collaboration.

Dr Shüler's expertise includes actor training for new technologies and education strategy. He has developed training for performing with Augmented Reality and has directed a version of Shakespeare's *A Midsummer Night's Dream* using AR in a Zoom performance. He has also trained actors to perform for 360-degree cameras, and collaborated on VR films.

Professor Jen Parker-Starbuck's work focuses on the intersection of performance and technology; she is the author of Cyborg Theatre (2011), co-author of Performance and Media (2015), and co-editor of Performing Animality (2015). Jen is also Head of the School of Performing and Digital Arts at Royal Holloway.

3. Optical imaging devices and 3D imaging techniques

Dr Shyqyri Haxha, Department of Electronic Engineering, Royal Holloway, University of London.

Dr Shyqyri Haxha is an expert in developing novel lens systems which allow 360 degree full field of view imaging. He has experience working with and designing standard plenoptic cameras / light field camera imaging across many business applications including bio medical and entertainment.

He has worked on designing photonic/optical imaging devices (lenses), subsystems, and systems for application in 3D sensing, medical imaging, 3D light field geometry of the plenoptic camera, new photonics and imaging for cancer cell detection. He is keen to support projects which explore optical imaging devices and 3D imaging techniques for ICVFX. Dr Haxha's work has relevance in possible applications for the development of lower latency image acquisition. Camera and lens frustrum latency, novel optical camera tracking solutions and light field technology in general.

4. Audio in virtual production

Prof David Howard, Department of Electronic Engineering, Royal Holloway, University of London.

In everyday life sound is all around us and is a vital element in establishing an element of situational naturalness. In VP, the spatialisation and the rendering clarity of different speech sounds could potentially be used as a means of communicating to the audience in a more natural manner their priority and/or importance in relation to the current situation or point in an experience with respect to their role in the scene and/or importance to the current situation.

Professor David Howard is interested in exploring whether there are optimum spatial placements that prioritise and/or organise the importance of individual messages in message or information streams, whether background music (including for example its volume, spatial placement, genre) impedes or aids the prioritisation of information outputs/inputs. Another avenue of investigation could be the queueing of messages where the audio manifestation of the message in some way becomes increasingly perceptually clear as its priority relative to other messages increases - the idea being that the presence of a number of messages in itself communicates the extent of information to be imparted and/or decisions that need to be taken.

Professor Howard has expertise in audio, human voice production and perception (speech and singing), music technology, as well as electronic engineering.

5. Artificial intelligence and machine learning in storytelling

Dr Li Zhang, Department of Computer Science, Royal Holloway, University of London.

AI poses a great R&D opportunity for VP, in the use of machine and deep learning for storytelling. Dr Li Zhang is interested in developing a project around the use of machine learning in storytelling; for example in facial expression and body gesture recognition, human action recognition using state-of-the-art machine learning techniques for the advancement of autonomous interaction with human subjects. Deep learning could also be used visual question generation, visual question answering and image description generation, and visual storytelling.

Dr Zhang's research focuses on AI, machine learning and deep learning for interactive storytelling, as well as human agent interaction and intelligent robotics. She has worked on AI-driven avatars with affect interpretation, AI for plot predication during improvisation, and intelligent agents enriched with automatic image understanding.

6. Neural networks and signal processing in virtual production

Dr Clive Cheong Took, Department of Electronic Engineering, Royal Holloway, University of London.

AI and the deep learning of neural networks has many potential applications for VP. Dr Clive Cheong Took is keen to support projects which focus on applications in images, including the generation of synthetic data such as in deepfake images (or metahumans), increasing image quality in terms of resolution or enhancing extremely dark images, image captioning, pose estimation of people in an image, and colourisation and realistic colour image enhancement by AI.

Dr Cheong Took also has expertise in signal processing and its potential applications, including filtering and denoising of signals and data capture, echo cancellation, and bio data capture such as 3D motion tracking sensors and other wearable sensors such as ECG, EMG, EEG.

Dr Cheong Took's work focuses on neural networks (deep learning in AI) and bio-signal processing.

4. Timeline and How to Express Interest

We will run a simple selection and matching process designed to be light-touch and foster collaborations with future potential, as follows:

Stage 1: We invite eligible companies to express interest by **5 June**. We will shortlist 6-12 SMEs and will inform them of the outcome by 7 June;

Stage 2: A sandpit event on 9 June for shortlisted companies to discuss collaborative project ideas with the academic partners; and

Stage 3: Companies submit short idea proposals by 15 June 2022. Please reserve some time to write these proposals between 9 and 15 June. Academics may hold a meeting with each company during this period to help them shape the ideas. Awards will be confirmed soon after the ideas are submitted.

The projects will run during 20 June –early October 2022, with outputs showcased to the StoryFutures and the broader innovation community in October/November 2022.

How to express interest:
Please complete our short expression of interest form by 5 June 2022.