

## PROJECT DESCRIPTION

### PROJECT TITLE

ChatGPT based AI game engine development

### PROJECT SUMMARY

Since its public release in November last year, ChatGPT has been rapidly integrated into various software tools and services. For instance, Microsoft introduced a new version of its Bing search engine that included a ChatGPT-4-powered chatbot. Google also unveiled Bard, its own ChatGPT rival, as a significant step in the company's efforts to regain lost ground in the race to deploy AI. Microsoft is also incorporating its own ChatGPT technology, known as Copilot, into its MS 365 suite of business software. Furthermore, there are innovative applications like Midjourney, an app that leverages cutting-edge ChatGPT technology to generate stunning images with just a few simple prompts, revolutionizing the way we think about image generation and making it more accessible for everyone.

The latest AI technologies, such as LaMDA from Google, Copilot from Microsoft, and ChatGPT from OpenAI, are creating entirely new ways to engage with information, spanning language, images, video, and audio. Industry developers are actively working to integrate these advancements into their products and services. For example, Google sees exciting opportunities in how AI can deepen our understanding of information and transform it into useful knowledge more efficiently, making it easier for people to find what they're looking for and accomplish tasks. AI can provide valuable insights for questions without a single correct answer. Soon, AI-powered features in Google Search will distill complex information and present multiple perspectives in easily understandable formats, helping people grasp the big picture and learn more from the web, such as seeking out additional perspectives from blogs of people who play both piano and guitar, or diving deeper into related topics, like steps to get started as a beginner.

This PhD project focuses on game engine development such as unreal engine and unity, and aims to integrate ChatGPT technology with game engine so that anyone will be able to freely develop their individual games through ChatGPT based AI game engine. This will be the form of next generation of game engine. The project will work on the generative language models' APIs, e.g. initially powered by LaMDA with a range of models to follow. Then, it is possible to use a suite of tools and APIs that are released for users to build more innovative applications with AI models.

The ideal applicant for this project should have programming experience in unreal engine or unity. Moreover, this project will be based in industry partner company (Canada). The ideal applicant should be able to stay in Canada and work on MS Teams or Zoom. He/She could come back to UK as needed.

### ACADEMIC IMPACT

AI is a profoundly transformative technology that is being used in various ways today. It has the potential to help doctors detect diseases earlier, enable access to information in multiple languages, and unlock opportunities for individuals, businesses, and communities to improve lives on a global scale. However, it also raises concerns about the potential impact on traditional jobs, as AI agents have the capability to replace certain roles. As the boundaries

of AI technology are unpredictable, so are the potential influences on our lives. That's why we are shifting our focus to ChatGPT technology and exploring its applications in game engine development. We aspire to be active participants in this technological revolution, rather than mere bystanders, as we aim to become game players in shaping the future of technology through the use of ChatGPT.

Research-wise however, despite some amazing progressions, due to the fundamental challenges, it is still at a very early stage. Many research questions are either not answered, nor are they even asked. The aim of this PhD project is to investigate and create novel algorithms and techniques leading to the development of next generation of game engines. The research outputs will benefit REF directly.

## **SOCIETAL IMPACT**

Communities in UK are facing certain common social and economic challenges related to improving the R&D ability of SMEs and start-ups, including strengthening collaboration among different fields of SMEs and collaboration between universities and industry, encouraging SMEs to invest in R&D. In fact, SMEs have been one of the main economic players, particularly in ICT and in the creative industry. For example of Bournemouth & Poole, in the report of Tech Nation 2017, the digital Gross Value Added (GVA) was around £ 352 million, the digital high growth firms reached 26% of growth rate, and 199 Start-ups birthed in last year. In Continental Europe, for example of the business start-ups in France, in the INSEE Premiere 2018, the total number of business start-ups increased by 7% in 2017, reaching the highest since 2010. This project will tackle the challenges by enhancing the SMEs R&D's ability within ICT and creative industry.

## **PGR DEVELOPMENT OPPORTUNITIES**

We will arrange regular supervision meetings. The student will therefore benefit by understanding the global picture of the project; getting advice from the supervising academics; and reporting the problems.

At the same time, the student will be exposed to the knowledge and practice relevant to his investigation, such as the necessary tutorials for machine learning, computer graphics and deep networks.

The training courses from the Doctoral College, such as research methodology, academic writing and presentation, research ethics, project management, career development, will help the students develop their research skills in a wide context.

Additionally, the student will have opportunities to present his research outcomes on prestigious conferences (e.g. Siggraph, MIG) and participate in high-profile public engagement activities.

## **SUPERVISORY TEAM**

<b>First Supervisor</b>	Hongchuan Yu (NCCA)
<b>Additional Supervisors</b>	Jian J Zhang (NCCA)
<b>Recent publications by supervisors relevant to this project</b>	<a href="https://scholar.google.com/citations?user=k0u7iVAAAAJ&amp;hl=en&amp;oi=ao">https://scholar.google.com/citations?user=k0u7iVAAAAJ&amp;hl=en&amp;oi=ao</a>

## INFORMAL ENQUIRIES

Please contact the lead supervisor on the following email for informal enquiries:

Dr Hongchuan Yu

hyu@bournemouth.ac.uk

## ELIGIBILITY CRITERIA

The BU PhD Studentships are open to UK, EU and International students.

Candidates for a PhD Studentship should demonstrate outstanding qualities and be motivated to complete a PhD in 4 years and must demonstrate:

- outstanding academic potential as measured normally by either a 1st class honors degree (or equivalent Grade Point Average (GPA) or a Master's degree with distinction or equivalent
- an IELTS (Academic) score of 6.5 minimum (with a minimum 6.0 in each component, or equivalent) for candidates for whom English is not their first language and this must be evidenced at point of application.
- Good programming in game engines is essential.

## ADDITIONAL ELIGIBILITY CRITERIA

An ideal candidate should have a background in computer science, mathematics, engineering or a relevant subject.

## HOW TO APPLY

Please complete the online application form by **the deadline on the project webpage**.

Further information on the application process can be found at: [www.bournemouth.ac.uk/studentships](http://www.bournemouth.ac.uk/studentships)