

SCHOOL OF ARCHITECTURE AND INTERIOR DESIGN  
COLLEGE OF DAAP

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2024

PROJECT TITLE: reinforcement learning (RL) system through game engine

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**Project Description**

This project proposes the development of a sophisticated reinforcement learning (RL) system utilizing the robust and versatile environment of Unreal Engine 5 (UE5). The primary objective is to create a flexible and highly realistic simulation platform that can model a multitude of real-life scenarios, ranging from urban navigation to emergency response strategies. This platform aims to significantly advance the capabilities of RL algorithms by exposing them to complex, diverse, and dynamically changing environments. Leveraging the advanced graphical and physical simulation capabilities of UE5, the project will focus on creating detailed and varied scenarios in which RL algorithms can be trained and tested. These scenarios will include, but not be limited to, urban traffic systems, natural disaster simulations, and public safety response models. The realism and intricacy of UE5's environment will provide a challenging and rich training ground for RL models, allowing them to learn and adapt to unpredictable variables akin to those in the real world.

I want to find an undergraduate STEMM student with a background in RL and Unreal Engine. The student will be responsible for the development of the RL models and their integration into the UE5 platform in the summer of 2024. This involves designing and implementing neural networks that can effectively process complex environmental data and make intelligent decisions in real

time. The project will also explore the potential of using UE5's advanced rendering and physics engines to enhance the training process, making it more efficient and effective. Participation in the UPRISE program will offer critical support for this research in terms of funding and access to a diverse professional network. This project aligns with the program's goals by pushing the boundaries of STEMM research, particularly in the intersection of computer science and real-life scenario modeling. It aims to contribute significantly to the field of RL by demonstrating the potential of advanced simulation platforms like UE5 in training more capable and versatile AI systems, thereby fostering a new wave of innovation in technology application across various sectors.