Project Title: Virtual & Mixed Reality Military Training Simulation Development

Adviser: Andrew Palla, Director of Research & Technology, Vertex Solutions

Background:
Vertex Solutions is a human performance training and consulting company based in Champaign, IL. For more than 20 years, Vertex has offered an integrated portfolio of services centered on technology-enabled learning to help Government and commercial clients meet their unique human performance development needs and improve leader, individual, and collective performance.

Ongoing Projects:

- USAF A-10 VR Simulator: Flight and mission trainer for the A-10 including accurate flight dynamics, virtual avionics, targets, etc.
- USAF KC-10 VR Threat Simulator: Flight and realistic ground threat avoidance trainer
- USAF AC-130J MR Combat Mission Trainer:
  - Collaborative nine crew position VR training system
  - Collocated and dispersed crewmember participation
- USN MK-16 Rebreather Emergency Procedure Trainer: Wearable USB system emulator and high-fidelity system physics model coupled with immersive VR experience
- USAF AFWERX SBIR Phase II: Development and integration of various human-machine interface technologies with various USAF VR aircraft simulators
- AC-130J VR Fuel Cell Tank Maintenance Trainer: Development of system models, immersive VR experience, and additional enabling technologies

Student Project Description:
Successful applicants will have experience programming in C/C++ and will participate in VR/MR technology development efforts as required by program goals. Areas of active development are human-machine interface sensor technology development, integration, and testing; biometric sensor integration and testing; simulated system state machine development; integration of machine learning algorithms and approaches with VR/MR training technologies; and software integration with various commercial game engines.

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