

1. Research Title: Mobile Display Concepts for Multi-Modal Data

2. Individual Sponsor:

Dr. Vince Schmidt, AFRL/RHWI

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3. Academic Area/Field and Education Level

Preferred: Computer Science/Computer Engineering (MS or PhD)

4. Objectives:

The Warfighter Interfaces Branch (711 HPW/RHWI) is actively engaged in research using mobile computing platforms (tablets) and wearable near-eye displays (NEDs), such as the Android-based ODG R7 glasses. The objective of this research is to determine the types of data that should be presented to specific NED users, methods for presenting and visualizing the data, and mechanisms (keypads, gesture recognition, etc.) for controlling the fidelity and communication of all related information. The student researcher will evaluate the effectiveness of NED usage in specific environments by extending an unclassified scenario to demonstrate the viability of deploying one or more NEDs sharing a network with other data producers and consumers, such as fixed or mobile cameras and command and control (C2) network message traffic from diverse unclassified sources. The student will be heavily engaged in defining and generating much of this infrastructure and related scenario. The final products generated by this research will result in opportunities for publication and integration into RHWA's wearable display portfolio.

5. Description:

The researcher will survey, design, develop, and evaluate software implementations of algorithms and approaches for representing, fusing, visualizing, and manipulating the types of data that would be useful to present in wearable near-eye displays (NEDs). The research may include developing immersive environments and simulations using Commercial Off-the-Shelf (COTS) gaming engines (i.e. Unity, Unreal), developing communications and messaging constructs to transfer video and user telemetry information, and designing and demonstrating interfaces to exploit and support other devices and technologies that would enhance the mission effectiveness of NEDs. The student should be prepared to quickly produce software prototypes with various heterogeneous component simultaneously running in Android, Linux, and Microsoft Windows. A working knowledge of Java and Python are required. Motivated applicants will submit novel ideas and research concepts that include infrastructure and architecture descriptions.

6. Research Classification/Restrictions: Unclassified, no restrictions

7. Eligible Research Institutions: Universities local to WPAFB preferred, but not required.

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