

S&T Campaign: Human Sciences
Human Capability Enhancement
Training

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Research Objective

- Merge real and virtual worlds to produce new environments and visualizations where physical and digital objects coexist and interact in real time
- Develop training environments that are adaptive and allow cross domain training, i.e., between live training and other simulation training domains
- Increase training availability and quality, and reduce costs

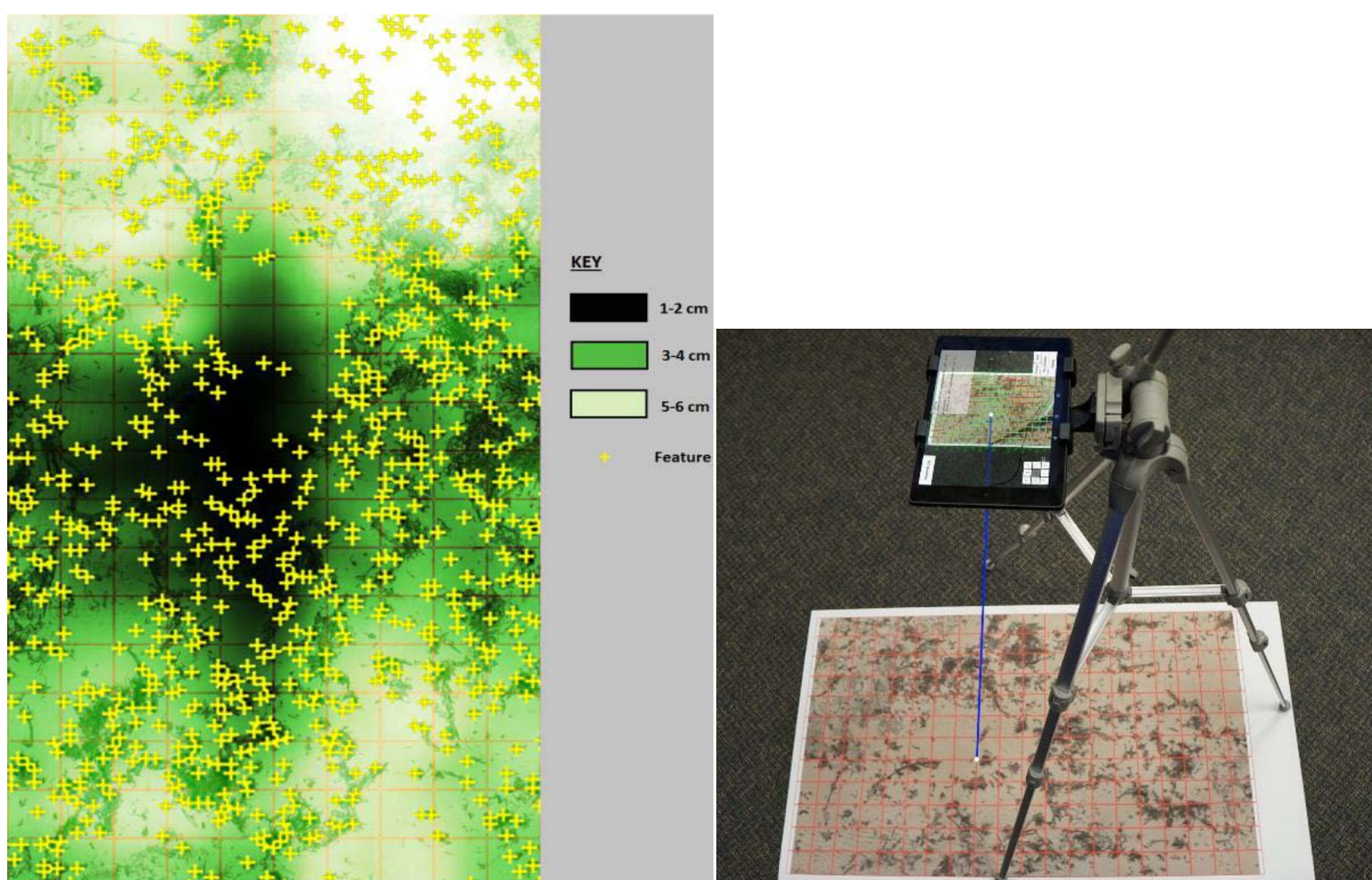


ARL Facilities and Capabilities Available to Support Collaborative Research

- Institute for Simulation and Training, University of Central Florida (UCF) provides access to top subject experts and first class facilities in modeling and simulation such as:
 - Computer Scientists
 - 3D Modelers
 - Terrain Experts
 - Game Design
 - Multi-Material Precision 3D Printing
- Motion capture studio
- Geo-specific training environment production
- Deep mobile Augmented Reality/Virtual Reality (AR/VR) development capability
- AR Science and Technology Objective at ARL
- Photogrammetry/Light Detection and Ranging (LIDAR) capture capability
- ARL Sensors & Integration Technology (John.w.Hopkins.civ@mail.mil, zeke.j.topolosky.civ@mail.mil)
- “U.S. Army Mobile Augmented and Virtual Reality Training systems for handheld IED detectors”, Reed, Eifert et al MAS 2017

Challenges

- Increase training effectiveness
- Real-time environment mapping
- Pose estimation errors
- High-fidelity soil representation
- Sensor modeling
- Swing-rate accuracy
- Lowering cost of training device



A system to gauge pose estimation accuracy



An ultra high fidelity model derived from Photogrammetry

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- Subject matter expertise
- Commercial pose estimation software may not be sufficient to provide centimeter accuracy
- Commercial off the shelf products may need an external inertial measurement unit (IMU) to facilitate high level of tracking needs
- Government off the shelf owned, high quality localization software