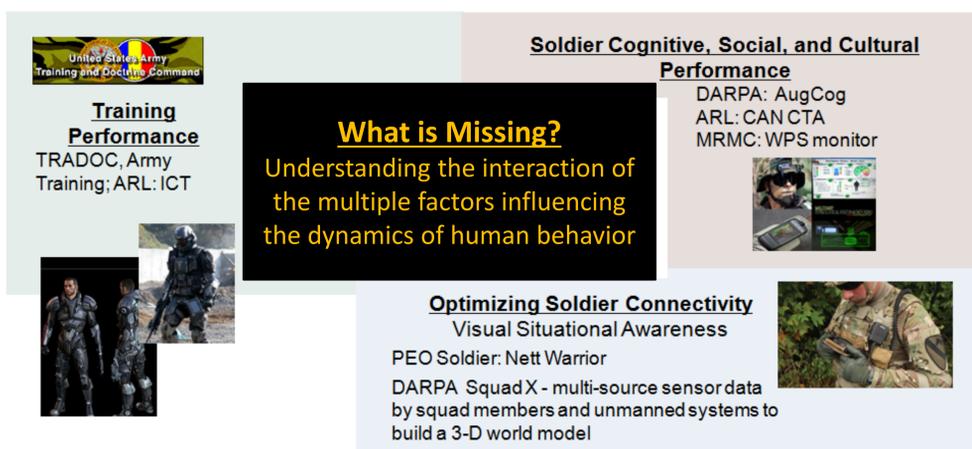


S&T Campaign: Human Sciences Human Behavior Human Variability

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Research Objective

- Develop algorithms and techniques to continuously interpret and predict moment-to-moment changes in Soldier state in real-world environments
- Integrate multiple emerging technologies to advance multi-faceted Soldier assessment for estimating and predicting natural, unique human states, adaptations, intents
- Develop approaches to integrate sensors, electronics and power on flexible 2D and 3D substrates



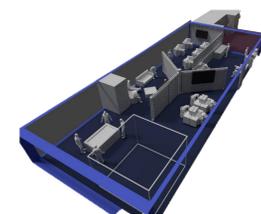
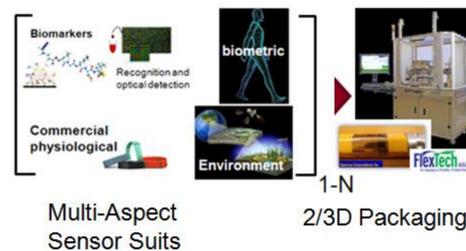
Program aims to characterize variability in human behavior on time scales ranging from milliseconds to years. The overall objective will be to predict changes in Soldier state as a means to optimize performance.

Challenges

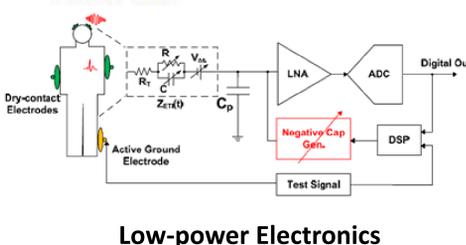
- Develop models for assessing and predicting moment-to-moment changes in individual Soldiers state under real-world conditions with degraded sensor in Soldier-borne sensors with power efficient electronics to determine the state of the Soldier
- Integrate situational awareness data for complete model and data sets

ARL Facilities and Capabilities Available to Support Collaborative Research

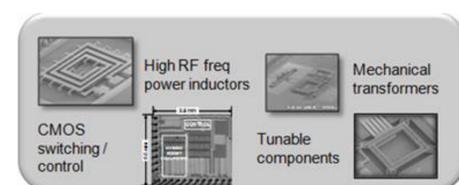
- Multi-faceted real-world measurement capabilities
 - Wearable, Un-tethered Operation
 - Flexible, fully customizable user interface
 - Multiple modalities: EEG, EKG, EDA, respiration, blood pressure, motion, posture, and others
 - Developing an "Innovation Commons" for continuous tracking of environmental and social interactions that may influence human behavior
- Soldier assessment experimentation capabilities
- Low-power electronics design laboratories, power transmission system research labs
- Flexible Electronics for sensor research
- Program has ARL collaborations with experts from numerous disciplines



Innovation Commons



Low-power Electronics

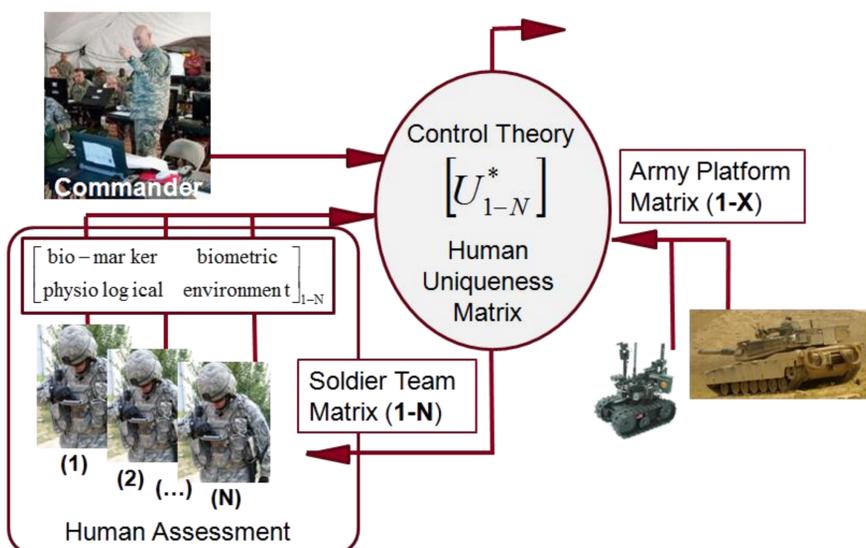


Wearable wireless power transmission

ARL Facilities and Capabilities available to support collaborative research efforts

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- Industry & academic partners to collaborate on human performance monitoring with a specific interest in wearable and network based sensing
- Industry & academic collaborators to analyze and contribute to large human subject data with the objective to define models to optimize group-performance
- Soldier and teams to test and evaluate sensors and models



Illustrations for the technical challenges addressed in Soldier Uniqueness Program