Cyber-Physical Sensing Working Group Meeting

7-8 August 2024

**"Sensing the induced effects from the physical world
through the cyber-domain"**

Cornell University (Tentative)

The Cyber-Physical Sensing Working Group (CPSWG) meeting is scheduled for 7-8 August 2024 at Cornell University.

The CPSWG welcomes participation from representatives of your organization and persons interested in cyber-physical sensing research and solutions. The general sessions will be held at the UNCLASS level. More information to follow.

Timeline

25 March	Call for Participation
10 May	Response deadline (presentation abstract or working session)
7 June	Presenters notified of selection
8 July	Draft agenda and registration details distributed
26 July	Presentation submitted

Background:

Cyber-physical sensing explores sensing the induced effects from the physical world through the cyber-domain. The effect only exists as a product of cyber-systems and their interactions. This includes phenomena transmitted through cyber-physical devices and the interconnected data networks to infer information through effects such as digital noise, bit errors, or latencies. By taking advantage of abundant measurement sources from proliferated devices and sensors, this provides a cost-effective advantage to designing more measurement stations or sensors. The Air Force Research Laboratory's (AFRL's) Multi-Domain Sensing Effects & Analysis Branch is spearheading this effort. For the purposes of this working group, we ask that presenters keep the topics related to cyber-physical sensing instead of pure cyber applications.

Call for Participation / Topics Include:

1. Architectures/Frameworks
   - Cyber Physical Systems (CPS) architecture and protocols
   - Sensor data storage, retrieval, and processing
   - Smart infrastructure (i.e., smart cities, wearables, agriculture, industrial, transportation, etc.)

2. Cyber Kinetic Effects
   - Supervisory Control and Data Acquisition (SCADA) / Industrial Control Systems (ICS)
   - Vulnerabilities/reliability in distributed sensor networks

3. Unconventional Sensor Exploitation
   - Using traditional and non-traditional sensors for unintended purposes
     i. Battle Damage Assessment (BDA)
     ii. Detection, ID, and tracking of Critical Mobile Targets (CMT)
     iii. Pattern of Life (PoL)
   - Proliferated sensing/sensing using existing infrastructure
   - Multi-Sensor/Multi-Domain   fusion
   - Distributed sensing
   - Modeling and Simulation (M&S)
   - Artificial Intelligence/Machine Learning (AI/ML)
   - Heterogenous Aperture Synthesis - fusion (synthesis) of data from one sensor modality/type to augment the capability of a sensor (or array of sensors) of a different modality

4. Edge Analytics
   - Edge processing and inference on user end node devices/edge sensors
   - AI/ML on edge connected $\mu\mu$-processors, TPU, and CPU/GPU
   - Mobile/cloud computing
   - Distributed processing/ resource sharing

Submissions:

- Presenters:
Email unclassified abstract to (AFRL.RYAA.CPSWG@us.af.mil)
  - If planning to present any classified material- reach out to maria.reed.ctr@us.af.mil for details
- Submissions must include:
  - Title, authors, classification level of presentation
  - Abstract not to exceed 500 words

For more information, please contact:

Maria Reed

937-713-8279

AFRL.RYAA.CPSWG@us.af.mil