



51st IEEE Applied Imagery Pattern Recognition Workshop

Cosmos Club, Washington D.C.
October 11-13, 2022

Building Trust in Artificial Intelligence

AIPR continues the half-century of success and tradition in pioneering new topics in applied image and visual understanding. Artificial intelligence (AI) & machine learning (ML) have proven to be extremely useful in analyzing and classifying images and are now prolific in image analysis, robotics, face recognition, and beyond. But despite their performance, the details of their decision-making process remain obscure.

Artificial Intelligence has the power to do a great deal of good, as well as the potential to do great harm. To drive a future where AI systems are trustworthy contributors to society, these capabilities must be designed and verified for safe and reliable operation. We must build AI systems that are secure and resilient to adversarial attacks. These systems must be predictable, explainable, fair, and secure.

In addition to traditional AIPR topics, the 2022 IEEE AIPR Workshop will explore the following topics as they pertain to computer vision, imaging, and pattern recognition:

Assured AI & Autonomy
Responsible AI (RAI) & Explainable AI (XAI)
Secure Intelligent Systems

Theme topics include, **but are not limited to:**

- **Topics in Assured AI & Autonomy:** robustness & resilience, trust, fairness & bias, and security. Adversarial ML, adversarial threat analysis, deepfakes, and defenses against adversarial attacks
- **Explainability (XA), Predictability, and Interpretability in AI & ML:** applications such as medical image analytics, remote sensing, image understanding, and autonomous systems
- **Image-based Autonomous Capabilities:** transportation, medicine, robotics, manufacturing, defense, and space
- **Image Understanding:** captioning, inference, retrieval, summarization, scene modeling
- **Situational Awareness:** biometrics, surveillance, anomaly detection, environmental monitoring, video analytics, virtual, mixed, and augmented reality
- **AI Decision Support:** gathering and analyzing imagery, identifying, and diagnosing problems, expert systems, situational reporting
- **Remote Sensing:** space-time processing, change detection, natural resource monitoring, enabling cloud applications
- **Medical and Biological Applications:** diagnosis, intervention, prognosis, global health, scientific discovery
- **AI Tools:** for assisted image analysis, deep learning, visualization, performance metrics and evaluation methodologies, and verification & validation using data fusion and non-traditional data
- **Modeling, Simulation, and Synthetic Imagery:** image data generation, training and validation of vision models, simulation for vision-based systems, Generative Adversarial Networks (GANs)

The Applied Imagery Pattern Recognition Workshop promotes and encourages the interdisciplinary exchange of ideas. Our purpose is to bring together researchers from government, industry, and academia to facilitate technical interchange across a broad range of disciplines.