Autonomy, Explainability, Practicality in AI

Incremental Validation in Unsupervised Learning (UL)

- Assess quality of clustering of new data in real time
- Much faster processing, smaller memory footprint

Adaptive Resonance Theory (ART)

- The leading engineering research group in ART
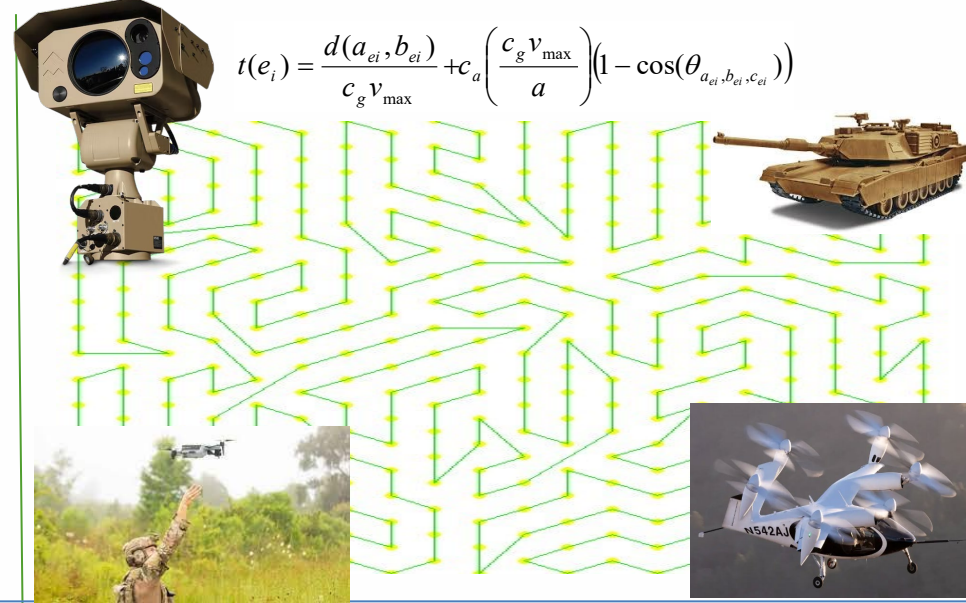- The most biologically-plausible neural nets

Reinforcement Learning (RL) in Decision and Control

- Dealing with challenging cost function and models
- Hybridization of RL with other techniques

Explainable Artificial Intelligence (XAI)

- Ontological Reasoning for fault detection, diagnosis
- Natural Language Processing
- Statistics

Real-time UL and RL enhancing national security

$$t(e_i) = \frac{d(a_{ei}, b_{ei})}{c_g v_{max}} + c_a \left(\frac{c_g v_{max}}{a} \right) \left(1 - \cos(\theta_{a_{ei}, b_{ei}, c_{ei}}) \right)$$

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Natural Language Processing and XAI in Biology and Medicine

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