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

\[ \tau(e_i) = \frac{d(a_{et}, b_{et})}{c_v \cdot v_{max}} + \alpha \cdot \left( \frac{c_v \cdot v_{max}}{a} \right) \left( 1 - \cos(\theta_{a_{et}, b_{et}}) \right) \]

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Natural Language Processing and XAI in Biology and Medicine