



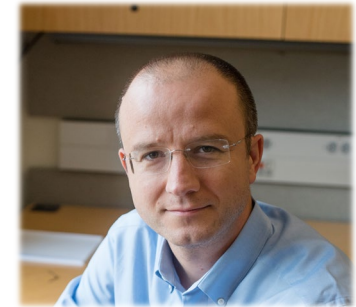
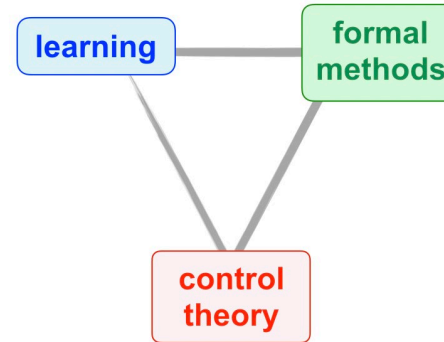
Research Objectives and Key Challenges:

Develop theory and algorithms for autonomous systems to...

- operate in dynamic, uncertain environments;
- adapt to unforeseen tasks and users;
- be affordably and provably verified not to pose safety risks; and
- be integrated into the infrastructure at scale.

High-Level Technical Approach:

- Develop hybrid solutions in the intersection of controls, formal methods and reinforcement learning.



<http://U-T-Autonomous.info>

Potential AFRL Collaboration Areas:

- Decision-making under perceptual and communication limitations
- Verification and automated synthesis of autonomy protocols in adversarial environments
- Safety-constrained learning

Center Research Areas:

- Adaptation, optimality, and synthesis
- Protecting integrity of mission- and safety critical information

Recent Accomplishments:

- ✓ Developed provably safe reinforcement learning algorithms via “shielding”
- ✓ Developed new inverse reinforcement learning algorithms that leverage existing contextual knowledge for data efficiency and generalizability
- ✓ Developed discretization-free synthesis and verification algorithms subject to temporal logic specifications

Current Funding:

- DOD, NSF, NASA, Sandia National Laboratory