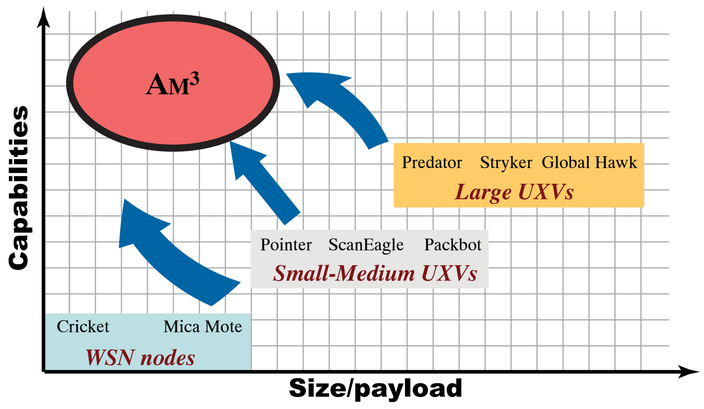
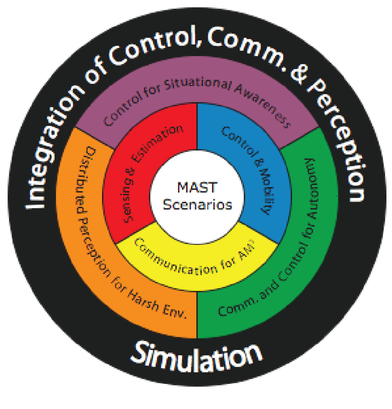
Micro Autonomous Sensors & Technology (MAST)
Processing for Autonomous Operation

Challenges

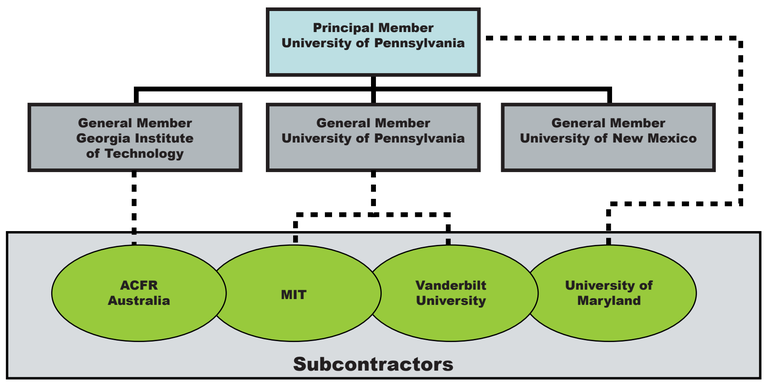
– Developing intelligent, capable systems at the micro-scale
– Building a cohesive team that can self-organize, and coordinate based only on high-level task descriptions
– Operation in unstructured, 3-dimensional, harsh environments



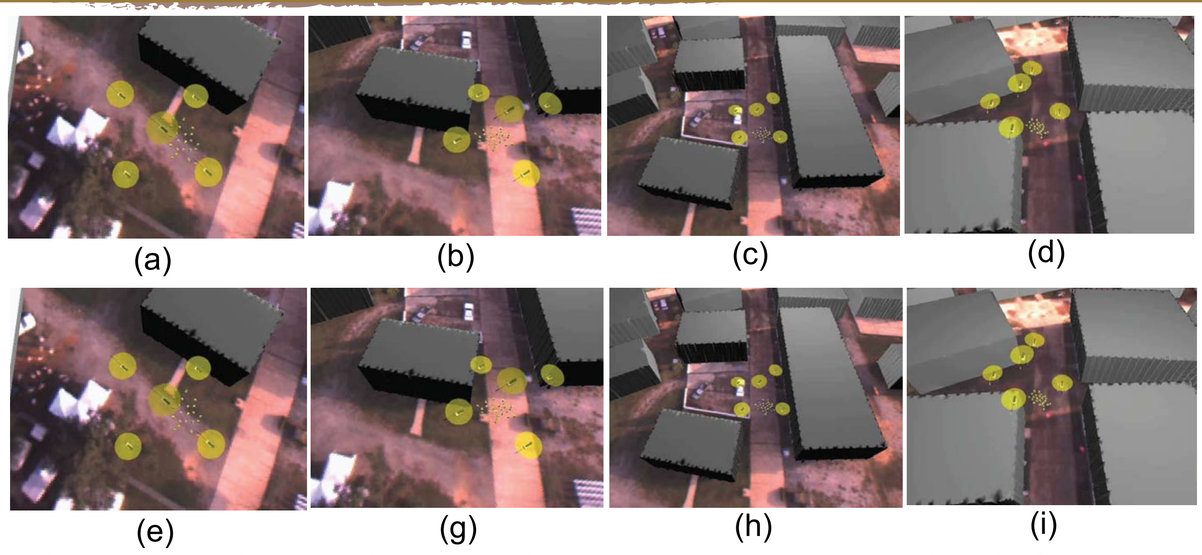
Thrusts



Team



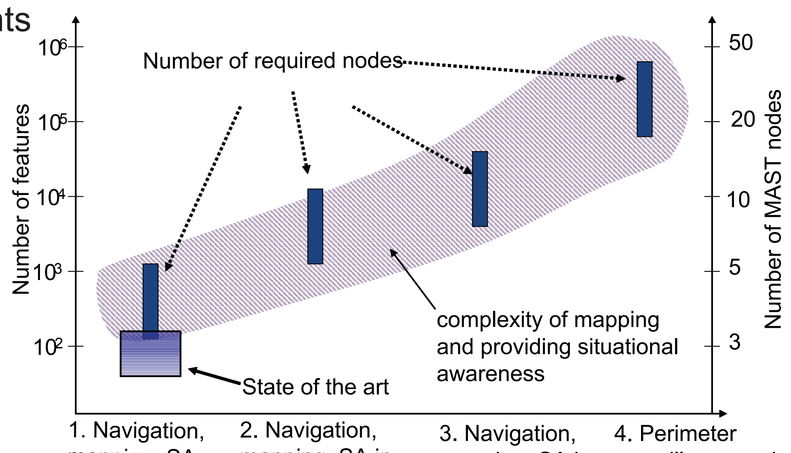
Simulation



It is essential to develop a simulation environment for MAST platforms to enable prototyping, testing and evaluation in MAST environments

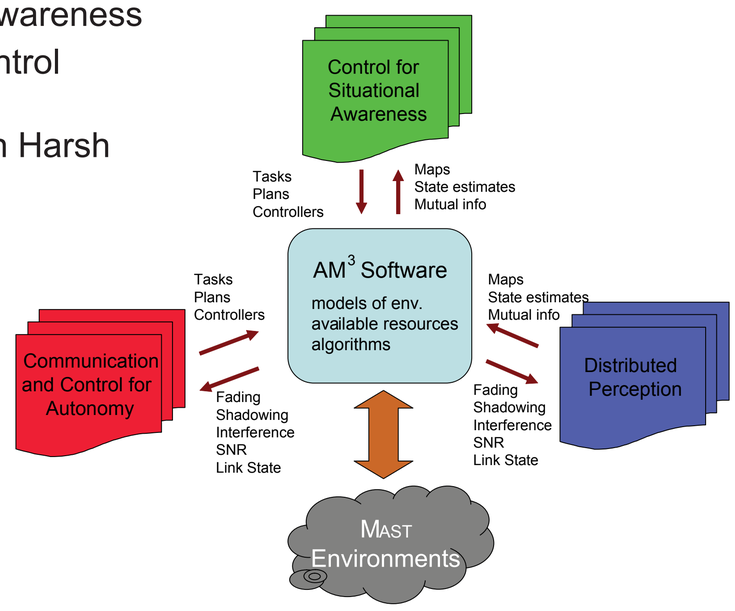
Distributed Perception in Harsh Environments

– 3-D localization without GPS
– Mapping in 3-D environments
– Distributed algorithms in noisy environments



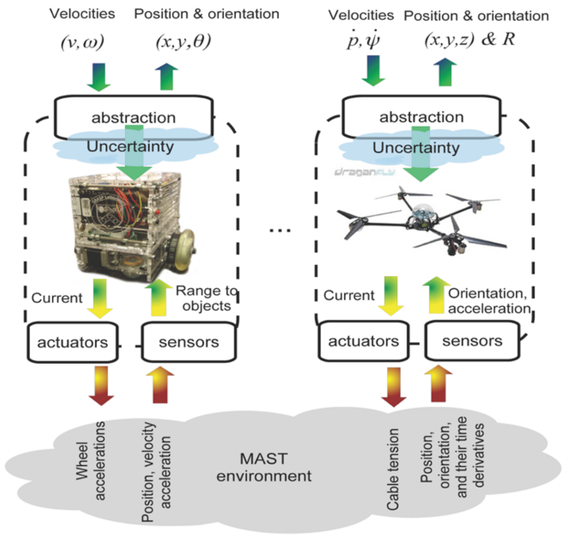
Software Integration

– Control for Situational Awareness
– Communication and Control for Autonomy
– Distributed Perception in Harsh Environments

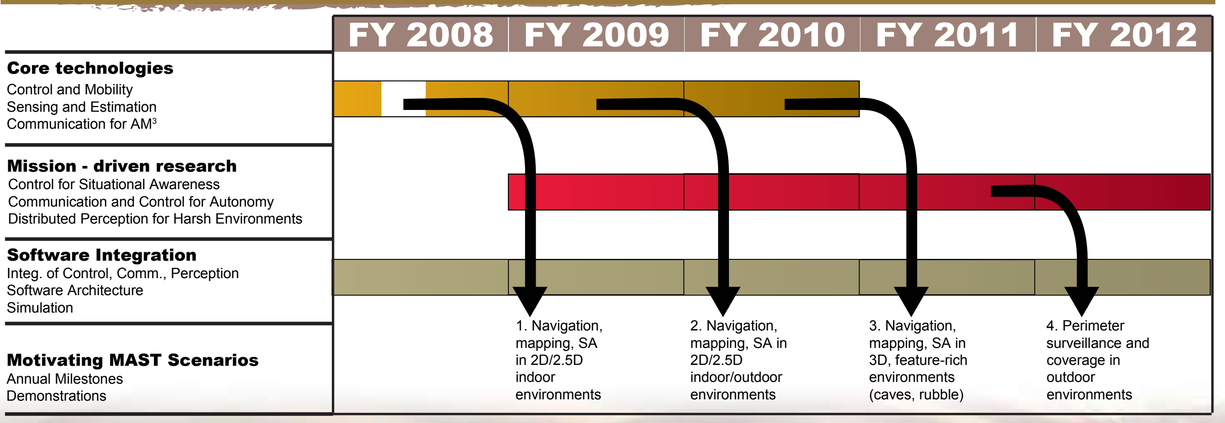


Control for Situational Awareness

– Abstractions for modeling, simulation and control
– Navigation in 3-D, unstructured environments
– Adaptation with resource-constrained platforms



Timeline



Communication and Control for Autonomy

– Maintaining ad-hoc networks in lossy environments
– Adapting to dynamic environments with changing topologies and fading
– Optimization and trading off sensing, communication and control