Time & Location: July 1, 2019 at 9:30 AM in Engineering 1 386
Title: Rapid Orbital Motion Emulator (ROME)

Spacecraft motion control algorithms implementation and testing are of high importance in space missions design. There is a need for rapidly testing control algorithms for space missions at a low cost. A novel robotic system that emulates orbital motion in a laboratory environment is presented. The system is composed of a six degrees of freedom robotic manipulator fixed on top of an omnidirectional ground vehicle accompanied with on board computer and sensors. The integrated mobile manipulator is used as a testbed to emulate and realize orbital motion and control algorithms. The kinematic relations of the ground vehicle, robotic manipulator and the coupled kinematics are derived. The system is used to emulate an orbit equation trajectory in real time. The system is scalable and capable of emulating servicing missions, satellite rendezvous and chaser follower problems.

Major: Aerospace Engineering

Educational Career:
Bachelor's of Aerospace Engineering, BS, 2011, Cairo University
Master's of Aerospace Engineering, MS, 2016, Cairo University

Committee in Charge:
Tarek Elgohary, Chair, Mechanical and Aerospace Engineering
Yunjun Xu, Mechanical and Aerospace Engineering Department
Tuhin Das, Mechanical and Aerospace Engineering Department

Approved for distribution by Tarek Elgohary, Committee Chair, on June 14, 2019.

The public is welcome to attend.