Cal Poly Pomona’s Colleges of Engineering and Science are engaged in many aspects of uninhabited aerial vehicle (UAV) research using both aircraft and helicopters. Our current research involves the development and validation of flight dynamics models, control system design, development of robust controllers, intelligent control of UAVs, collaboration between UAVs and ground vehicles, image processing for target recognition, tracking of mobile targets using UAVs, obstacle avoidance, and development of avionics systems for control of multiple vehicles.

CPP’s aircraft UAVs include custom twin-engine airplanes, 12 ft Telemaster, and Alpha 60 airplanes.

These vehicles are being used for flight dynamics and control research.

CPP’s UAV Lab consists of fixed- and rotary-wing UAVs. The latter include a Yamaha R-MAX, a Thunder-Tiger Raptor 90, and a SR-100.

The R-MAX helicopter was donated to the university by Northrop Grumman and is equipped with WePilot for autonomous flight, and can carry 60 pounds of payload.

The Lab also maintains Piccolo autopilots, ground control stations, and multiple Hardware-in-the-Loop (HIL) simulation environments.

Also available for research are Inertial Measurement Units (IMUs), single board computers, and microcontrollers, a stabilized camera gimbal, FLIR (Forward Looking Infrared) cameras, off-the-shelf autopilots, a video processing system, and several desktop and laptop computers including toughbook computers.

These equipment items are available for collaborative research and for student projects and competitions. A 12 ft wingspan Telemaster airplane is being used for CPP’s entry into the AUVSI Student Unmanned Aerial System (SUAS) competition, which requires student teams to identify shape, color, and location of simulated targets on the ground while flying autonomously.

CPP’s Astronautics Lab does CubeSat development, sounding rockets and payloads, high altitude balloons, and the CanSat competition. Research has been done on NASA’s Zero Gravity Aircraft.

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