Abstract – Team Ganges

There is considerable research being done into the feasibility of short range Unmanned Aerial Vehicles (UAVs), for delivery of goods from online retailers such as Itchen. In order to transport the cargo effectively the UAV must have a high maximum cargo weight to UAV weight ratio (cargo-UAV ratio), produce a stable flight-path and have enough battery life to transport the cargo then return to the base-station.

We can afford a reasonable cargo-UAV ratio using 4 brushless DC motors, controlled by ESCs. For stability, a microcontroller receiving feedback from a gyroscope-accelerometer module, forms a PID controller. This controller system devolves much of the responsibility for stability from the pilot. A second on-board microcontroller handles communications with the ground to relieve strain on the control system. Log data is written to an on-board SD card and transmitted back to ground. The pilot communicates with the UAV using X-Y joystick potentiometers, switches and a microcontroller, which translate to desired Throttle, Pitch, Roll and Yaw values and activate the servo-controlled cargo acquisition mechanism.