THE HINDU

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Fly high

- GEETA PADMANABHAN

Venkata Srinath and the UAV

Geeta Padmanabhan is awe-struck by Chennai engineer Venkata Srinath's creation — portable micro / mini Unmanned Aerial Vehicle, and look up for more information

On a calm afternoon, I stood in a field off the Chennai-Bengaluru Road in Sriperumbudur. A few feet away, Venkata Srinath, ECE engineer from College of Engineering, Guindy, was setting up what looked like a tripod. He clamped a control panel to its belly and began to assemble a small plane. "Some of its components have been imported, there is system integration," he said straightening up. "Remember the tragic project in *Three 3 Idiots*? My inspiration."

He was ready. "This is a single-man portable micro / mini UAV (Unmanned Aerial Vehicle) launched as vertical take-off or by hand," he said, letting go of the vehicle. We held our breath as Garuda-02 soared into the sky and settled in its orbit above the field. Mission accomplished! "Note that there's no runway," said Srinath. "It lands on grass, sand, pebbles — any hard surface without damage." The UAV has embedded control equipment monitored by a Ground Control System (GCS). Its fully-charged battery (12.5V) helps it keep an eye on altitude, radius etc. I peep at the GCS.

Auto-return

Garuda-02 flew 200 mt above but could reach 1,000 mt around a five-km radius. It has a 30-minute run. Because of its small wing span (100 cm), it might go out of view, but does not matter. Srinath pressed the auto-return button (I hissed "come back!"), it came into view and landed neatly at the take-off point. Before packing up, Srinath removed a chip, inserted it in his laptop and clicked it open. So that's what the "toy" was all about — Garuda's hi-def camera had been taking pictures every two seconds while circling the area!

Imagine what an "eye-in-the-sky" means. Lab-electronics (where Srinath develops UAVs) lists 50 civilian / military apps, including fire-assessment, wildlife movement and disaster control.

Srinath's planning a high-end Garuda-04. "It will fly in a fixed route and transmit video from a daylight or night camera, controlled through a ground PC," he said. Gimbal mounting of cameras and digitally-stabilised videos will ensure clear pictures. Garuda-04 will track and lock a target, carry additional sensors to detect radiation and pollution in the atmosphere.

Eye-in-the-sky UAVs aren't new to Indian skies. Daksha, a UAV developed by Madras Institute of Technology was roped in to survey granite blocks and quarries spread over hundreds of acres in Madurai district. It is reported to have sent video footage of nooks and crannies not accessible to manual surveillance. Befitting a modern thriller, its live footage reportedly showed a secret room hidden among granite blocks.

Netra, built jointly by IIT graduate Ashish Bhat, friends (IdeaForge) and DRDO, is claimed to be the world's lightest and smallest UAV in its category. Weighing 1.5 kg, it can fly up to 1.5-km line of sight, can hover, spot a person 400 mt away, and send real-time images from 200 m above. The vehicle is compatible with thermal-imaging cameras for night-time use, can survey all terrains, including jungles, plains, mountains and deserts. Its rechargeable batteries give it a flight time of 30 minutes and a top-speed of 25 km an hour. The UAV's auto-pilot controller receives inputs from GPS, magnetometers, gyroscopes, accelerometers and altitude sensors, which provide stability to the vehicle and help it navigate. Our armed forces are thrilled about its use in anti-terror and counter-insurgency operations, hostage situations, border infiltration, law enforcement, search-and-rescue, disaster/crowd management. It proved its worth, covering a Chandigarh rally. It is Netra you got to see in *3 Three Idiots*.

A quiet revolution

Is flying UAVs permitted? BBC's *Newsnight* discussed it. Calling it a "quiet revolution", it said civilian UAV projects are on for border security, police surveillance and even transporting goods. All this raises serious safety and privacy questions. The US airspace regulator (FAA) expects 10,000 unmanned commercial aircraft to fill American skies by 2017, a plan that has faced fierce criticism. Campaigns are underway to make a number of US cities "drone free" and politicians want drone operators to inform the government of any data collected.

UAV development, however, seems unstoppable. A key piece of technology currently missing in civilian drones is a "detect-and-avoid" system that will automatically steer the pilotless craft from commercial airliners and crash-land in a safe area, if needed. "Whoever cracks it first will have a winner on their hands," BBC said.

(For details, visit www.labelectronics.com)

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When airborne, UAV's wings fly point-to-point using the same GPS technology found in most smartphones

Multinational freight firms want unmanned aircraft to deliver mail and cargo

Small wing-shaped drones are being used to photograph and analyse agricultural land, to pinpoint where extra fertilizer / pesticide is needed

Police forces have tested small, lightweight drones as air support units

It is legal to fly your drone in the U.K. without special permission if it weighs less than 20 kg and is flying more than 150 m from a congested area