

IISc prof devises means to avert air crashes

Algorithm Can Detect And Destroy A Target

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Bangalore: Mid-air collisions are disastrous. Potential collisions are chilling. Developing technologies that sense an oncoming collision are vital to save lives and aerospace scientist Radhakant Padhi of IISc has done precisely that.

Padhi has developed a technology that can prevent mid-air collisions of manned and unmanned UAVs and potentially those of commercial aircraft too. Padhi's technology, known as the MPSP algorithm, is a series of pre-installed instructions which can detect and destroy a target.

"Mission-specific instructions are fed into a flight device that ensures that an aerospace vehicle reaches its destination even if it deviates from the pre-defined path. The algorithm acts as the virtual brain of a flight vehicle."

As UAVs fly at a low altitude, they tend to collide with low-lying objects and even other flying UAVs. "An algorithm had to be worked out that could detect and avoid these objects and other UAVs. The algorithm is a set of instructions and computations that enables this. It is an intelligent system that enables guidance and control," Padhi explained.

Padhi's algorithm which has features of smart intelligence can be used in aircraft that are also conventional. The devices with the algorithm/instructions would identify objects flying towards or in the path of the aircraft by detecting their presence and enabling preventive action. The advance detection is a crucial function of the algorithm based on mathematical predictive models.

Padhi who started work on the algorithm while doing his ME in aerospace at the IISc, in 1996, gave it a conclusive form while working on advanced missile technology at the Research Centre Imarat, DRDO. He developed an advanced version of the MPSP algorithm while working on one of the missile guidance problems in 2005.

Padhi, currently working as an associate professor at the department of aerospace engineering at IISc, has specialised in fields such as intelligent control using neural networks, development of efficient numerical algorithms for advanced guidance and control design, guidance and control system design for short/long-range missiles, guidance and control system design for launch vehicles and advanced nonlinear control system design for modern aircraft.

Padhi, who has now received a funding of \$80,000 from the Air Force Research Lab, US, to develop collision avoidance algorithms for UAVs, shot to fame in the US after preparing a paper on the technology. Avoiding mid-air collisions being a top priority, the paper attracted global attention.

Padhi has already completed related work in this field with a Rs 15 lakh-project for a South Korean University to design advanced control technology for a challenging supersonic air-breathing engine through a local company in Bangalore. **FIELD TRIALS**

DRDO will conduct field trials of a defence shield over Indian airspace

A shield can intercept and destroy any incoming ballistic missile

DRDO will use Padhi's technology in the trials

A flight test of the anti-missile system will be undertaken again in June to build ballistic missile defence (BMD) shield against incoming medium- or long-range missiles



Radhakant Padhi