A MULTIROTOR WITH A VERTICALLY OFFSET OVERLAPPING CONFIGURATION AND USES THEROF
IITM Technology Available for Licensing

Problem Statement

- In the present era, there is a growing possibility for the use of aerial robotic system or unmanned aerial vehicle (UAV) in multiple applications. There is a renewed interest in designing such systems to achieve better performance.
- The multirotor/quadrotor fits into the class of unmanned aerial systems and the critical parameters of a multirotor **are its size, payload carrying capability, and endurance**.
- One of critical factors to decide the utility of the quadrotors for a particular application is its payload capacity. The usual practice to increase payload carrying capability is by increasing the size of propeller or increasing the number of rotors . However, **increased no. of rotors and size of the rotors** in conventional design is not considered as a good alternative.
- Hence, the present patent is introduced to address the above issues in an efficient manner.

Technology Category/ Market

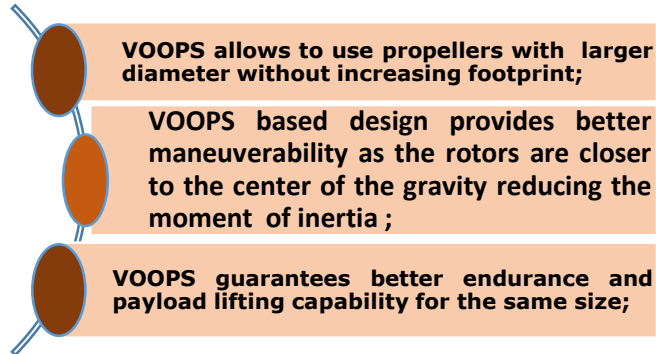**Technology:** Unmanned aerial vehicle (UAV)
Industry: UAV Industry; **Applications:** Military & defense**;** Logistics & Transportation, civil & commercial, construction & mining, Medical and agriculture;
Market: The **global unmanned aerial vehicle** market was valued at **$** 24.72Billion & is projected to reach **$70.91**billion by **2030**, at a significant **CAGR** of **15.6%**

Technology

- Present Patent describes an **unmanned aerial vehicle (UAV) configuration** comprises more than one frames, plurality of motors, plurality of propellers, landing gears and a standoff, designed efficiently and illustrated in figures.
- Said patent relates to a **vertically offset overlapping propulsion system** (**VOOPS**).

- VOOPS is a characteristic **propeller configuration with a layered design,** featured in smart chart hereinbelow.

> **VOOPS allows to use propellers with larger diameter without increasing footprint;**

> **VOOPS based design provides better maneuverability as the rotors are closer to the center of the gravity reducing the moment of inertia ;**

> **VOOPS guarantees better endurance and payload lifting capability for the same size;**

Intellectual Property

IITM IDF Ref.: **1236;**
IN Patent No. 421215 (Granted)

Key Features / Value Proposition

- ❖ ***Technical Perspective:*** Present Patent provides efficient configuration which allows assembling propellers with **larger diameter**, **without increasing its footprint.**

- ❖ ***Industrial Perspective:***
- UAV design is configured professionally **without affecting footprint and disturbing its actual size**;
- Present **UAV configuration** achieves **better performance** in terms of payload capacity, endurance and power rating.

TRL (Technology Readiness Level)

TRL- 4, Proof of Concept Ready Stage & validated;

Research Lab

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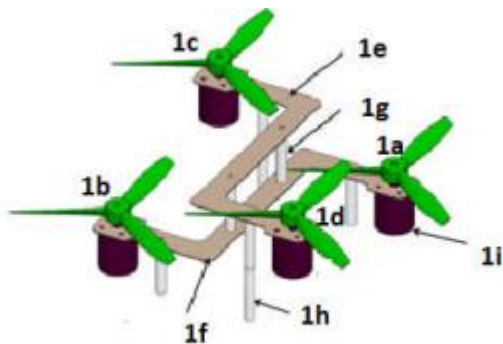## IITM Technology Available for Licensing

Images

Fig. 1: Illustrates isometric view of VOOPS Quadrotor showing propeller, upper & lower Z frame, standoff, landing gear, motors;
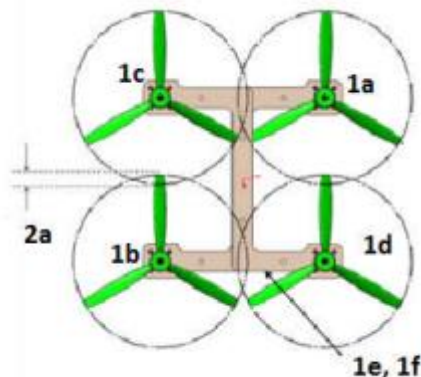

Fig. 2: Illustrates top view of VOOPS Quadrotor showing overlap, propellers, upper & lower Z frame;

Fig. 3a: Illustrates prototype of the VOOPS Quadrotor configuration in landed mode

Fig. 3b: Illustrates prototype of the VOOPS Quadrotor configuration in flying mode

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