AI AERIAL
DYNAMICS

Company Profile

WWW.AIAERIALDYNAMICS.COM

Fully Integrated UAV Solution

Ai Aerial Dynamics, a leading provider for customized aerial surveillance solutions, indigenously designed a fully integrated and powerful solution with latest aerial platforms that expands the operational capabilities of our customers. They are currently engaged with the development of unmanned aerial vehicles, Anti UAV system and Improvised Explosive Device (IED) detection system.

The new UAV solution offers an easy and safe aerial access to challenging areas, a larger surface coverage in a single flight, a higher resolution images and an opportunity to acquire aerial data with a cost effective, and efficient tool.

Unmanned Aerial Vehicle

It is a completely automated UAV with a unique hybrid design for long endurance up to 3Hrs. The UAV has the payload capability from 200g to 120 Kg and a heavy payload version can be used as personal human carrying aerial vehicle and air ambulance. Designed for application like 3D Aerial Mapping, Precision Agriculture, Security and Surveillance, Human rescue aiding disaster management

Garud Mini (Customizable)

Features

Max flying Weight	- < 1 kg
Max flying altitude	- 500m
Max distance TX	- 2000m
Max takeoff altitude	- 4000m
Wind resistance	- level 4
Flying time	- 20 Min
Transmitter Frequency	2.4ghz/5.8ghz
Range	1500 to 2000m

Anti UAV system

Counter-drone technology, also known as ANTI-UAS, refers to systems that are used to detect and intercept unmanned aircraft. As concerns grow around the potential security threats drones may pose to both civilian and military entities. After 7 years of Research and Development, we designed its latest system to detect intruding drones, the system is based on real-time directional measurements of a drone's electromagnetic emissions and intercept it then take countermeasure to get it down.

Features

AI (artificial intelligence) based real-time ALL frequency monitoring. | Can detect drone even before take-off

Up to 48THz/s sweep speed | Up to 50 km detection range | All-in-one solution (RF, radar, camera and software)

360° azimuth and full 90° elevation full dome coverage with high tracking accuracy

Enables 24/7 seamless recording (tracking and/or raw data) and monitoring

Scalable for huge sites (airports, cities, borders, even countrywide installations)

Improvised Explosive Device (IED) Detection

An approach for improvised explosive device (IED) detection using autonomous aerial drone (UAV) . The Autopilot is programmed to scan a predefined area, and to send the exact GPS location coordinates and flight path to ground control station. This system is designed as a fusion of multiple technologies to improve the success detection rate .

Ground Penetrating Radar | Chemo-Bio sensors | X-Rays
Non-Linear Junction Detector | Explosive Vapour Detector
Radio controlled improvised Explosive Device detection and Jamming
Radio-active material detection and mapping.

Indigenous Designed Unmanned Aerial Vehicle For High Altitude Deployment

Designed for automated aerial surveillance over high altitude (15000-20000 ft) areas where normal UAV are not deployable. VTOL- Vertical Take-off and Landing adds maneuverability and hovering capability and Ai based control system combined with predictive maintenance and multiple navigation sensors add reliability.Hybrid power source provides maximum efficiency and endurance. Centimeter level navigation accuracy and real time video and telemetry feed to Ground Control Station Auto Return Home against remote communication loss or battery/fuel low.Triple flight controller and navigation system for flight redundancy

Precision Agriculture

Site Specific Crop Management Using Unmanned Aerial Vehicle With On Board Ai Based Multi Spectral Imaging, Fertilizer Spraying, Weed And Disease Control Capabilities

Solution - Site Specific Crop Management using UAV

By Implementing UAV based site specific crop management we can

- Digitize agriculture field with crop health data
- Crop protection
- Identify crop growth issues faster
- A deeper understanding of plant's distress
- Connect GPS indexed maps to plant health features
- Advanced sensor fusion using IoT and Artificial intelligence

Solution - Crop protection

- Identify crop diseases/stress ahead of time
- Generate weed data
- Prevent soil erosion
- Efficient Irrigation planning from collected data
- Generate Digital Surface Models
- Software provide accurate yield predictions

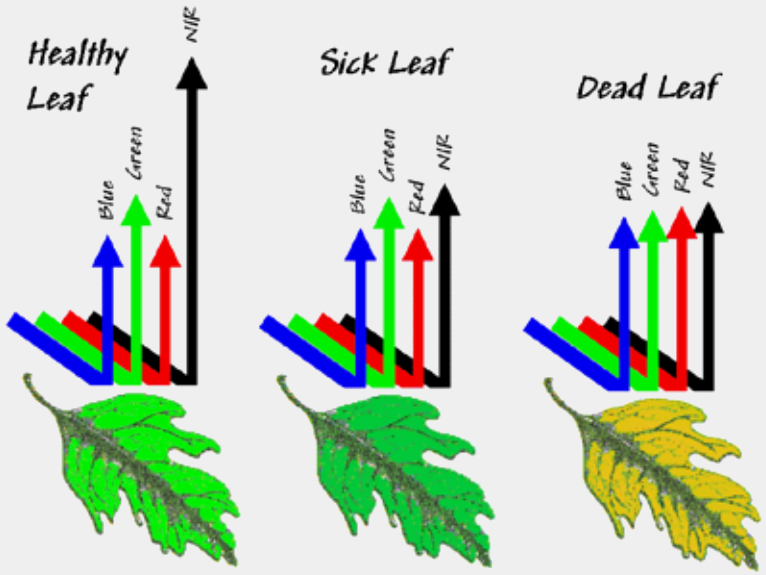
Solution - Pesticide spraying

- Precise fertilizer spraying as per plant health data
- Terrain following sensor to maintain uniform flow
- Swarmed UAV for parallel spraying
- Higher capacity payload

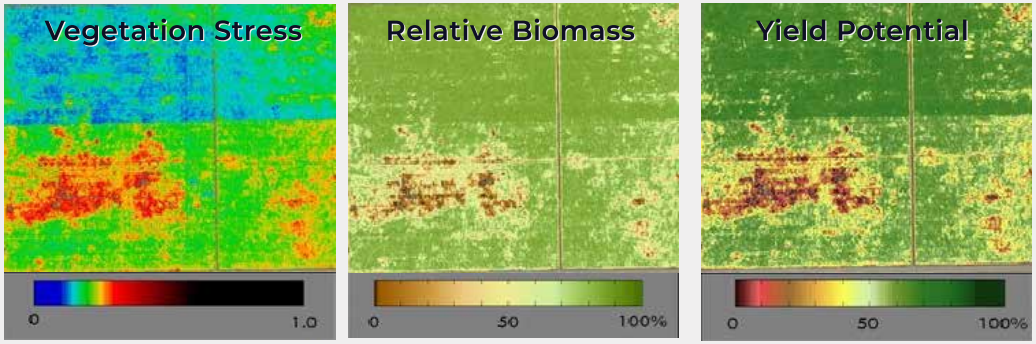
Technical Details

UAV Data Acquisition for crop heath monitoring with multispectral camera

Multi spectral camera can collect plant health data through aerially scanning the agricultural field



The red area indicated is heathy plants, yellow and green correspond to plants in distress



1 Field, 3 Layer of Insight

Data indicating crop heath level Output from multispectral camera. The spraying UAV can Automatically adjust the fertilizer proportion from the data collected by scanning UAV.

Agri UAS

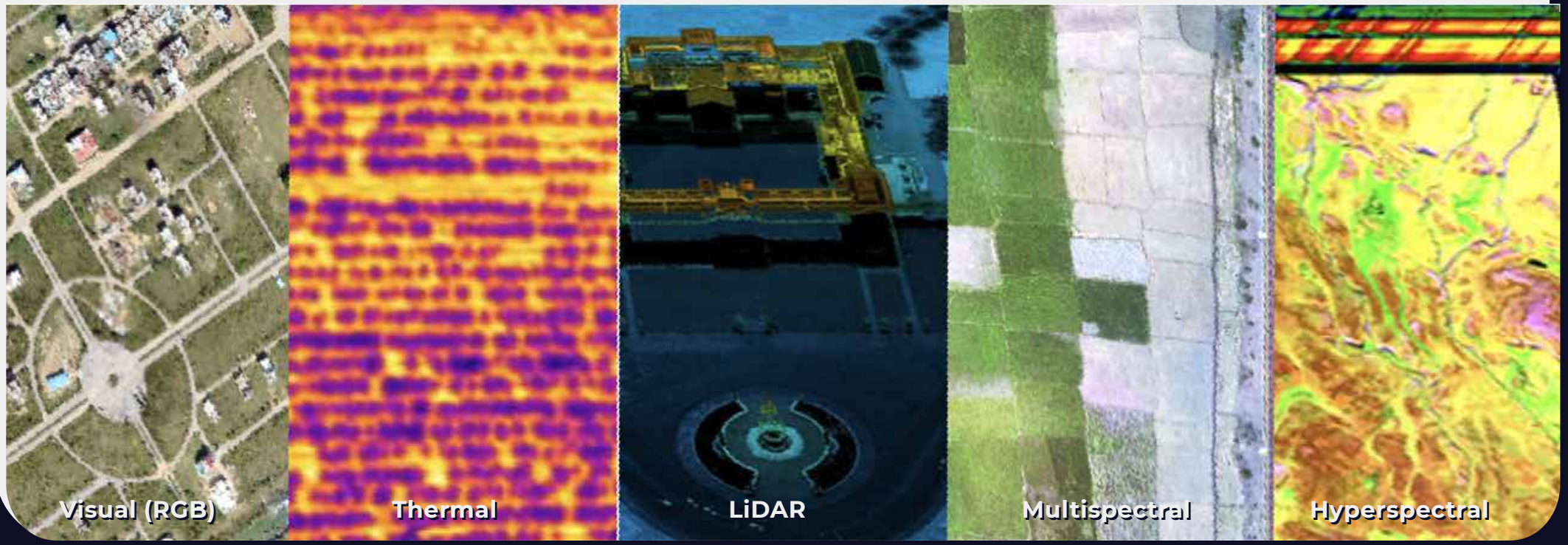
Unique Hybrid power source for long endurance

AI Based crop health monitoring and intelligent Plant nutrients spraying

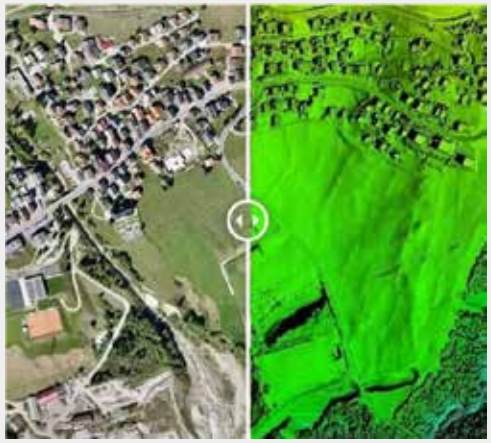
UAV Mapping and GIS Solutions

Our Domains

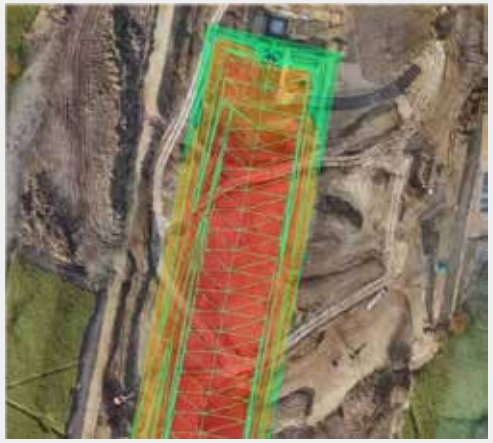
- Orthomosaic Contour
- 3D Model
- Digital Surface Model
- Digital Terrain model
- Digital Elevation Model
- Auto cad 2D & 3D
- Time based video inspection
- Geo referenced DSM's
- Volume measurements
- Resource Calculations
- Digitize models
- Mine development report
- Structural and terrain analysis
- Alignment of Divider
- Over line structures Boundaries
- Electric lines for Street Lights
- Expansion of roads
- Power lines crossings



UAV for Aerial 3D Mapping



Surveying and GIS



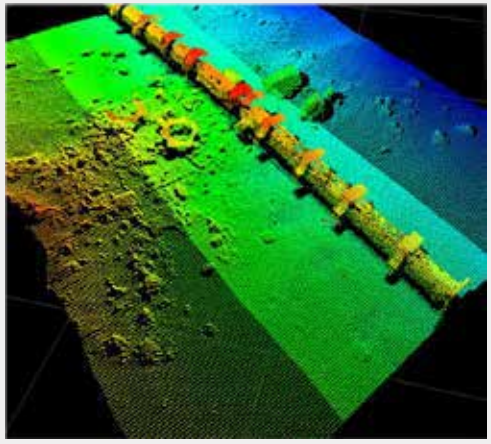
Mining and Aggregates

Construction & Infrastructure

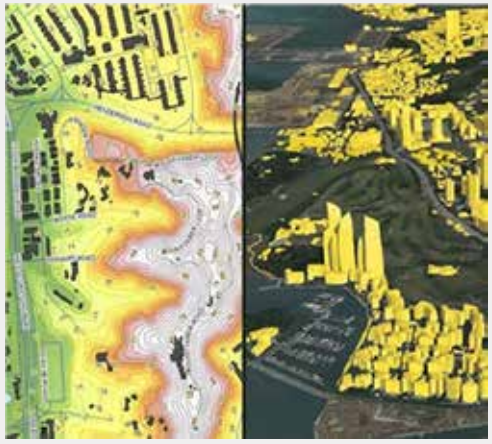
Environmental

Asset Mapping

Solid Waste Landfill Mapping



Roads, Railways, Water ways & Pipelines



Land Use & Land Cover In GIS

Output

Our solution combines state-of-the-art hardware and software components:

Camera Payload - High resolution camera sensor with active stabilization and automatic target tracking. Encrypted video down-link to Ground Control Station. Day and night thermal imager compatible.

GARUD – Our Vertical Takeoff and Landing UAV systems are integrated with multiple navigation sensors and failsafe mechanisms for reliability. All UAV are completely autonomous from takeoff to landing and deployed from mobile ground control stations .

RF Front End – A uniquely designed software defined radio front end adds capability to capture RF signals from 10Mhz to 6Ghz and an EDGE processing device with GPU processing is deployed to interpret RF communications in targeted area..

Ai - Indigenously trained Airtifical Intelligence Core can detect abnormalities with clinical accuracy. The anomaly to be detected an be trained as per client requirement.

GCS - Ground Control Station add flexibility to deploy UAV at remote location from a vehicle or centralized command center with capability to observe sensor data, telemetry and plan flight path autonomously.

Unique Features

FEATURES	 GARUD	 GARUD_20	 GARUD_80	 GARUD_C
Payload	2 kg	20 kg	80 kg	2 kg - 160 kg
Endurance	90 min	60 min	60 min	60 min
Service Ceiling	2 km	2 km	2 km	2 km
Transmission Distance	20 km	20 km	20 km	20 km
Rotors	4	8	16	-
Auto pilot	✓	✓	✓	✓
Hybrid	✓	✓	✓	✓
Live Video Feed	✓	✓	✓	✓
Obstacle Detection	✓	✓	✓	✓

The potential applications of drones is significantly increasing as the components that makeup the technology become more lightweight and affordable. The drones are scalable for heavy payload applications like sites like Personal Aerial Vehicle, disaster management for human rescue, Indian defence force, pesticide spraying in agriculture fields. AI Aerial Dynamics is engaged with the Defence Research and Development Organization – DRDO for customized manufacturing of Unmanned Aerial Systems and designed an indigenous stabilization system for payloads like sensors like camera, thermal imager and laser range finder. The company is working with the defence department on a project to detect explosive mines using drones and land rovers. As a combination of artificial intelligence and robotics our system provides the best detection rate and accuracy.

OUR CUSTOMERS

OUR CLIENTS

KERALA POLICE

Contracted Drone Surveillance service for Kerala Police

OUR CLIENTS

KERALA POLICE CYBERDOME

KERALA POLICE
CYBERDOME
Public-Private Partnership for Cyber Security

Partner us
in making
a secure cyber world

Contracted Drone Forensic service for Kerala Cyber Police

OUR CLIENTS

INDIAN ARMY

Indigenously designed UAV based landmine detection solution for INDIAN ARMY

OUR CLIENTS

Indigenously designed UAV to deploy sensor payload

for Defence R & D Organization (DRDO) INDIA

CASE STUDIES

KERALA FOREST AND WILDLIFE DEPARTMENT

Working in partnership with Kerala Forest Department for Wildlife Tracking & Ai Based Aerial Surveillance

CASE STUDIES

KERALA DISASTER MANAGEMENT AUTHORITY

Working in partnership with Kerala Disaster Management Authority for

Life Support, Medicine Delivery and Flood Monitoring

CASE STUDIES

DEPARTMENT OF ARCHAEOLOGY
AND SURVEY

3d Aerial Survey and Illegal Construction Monitoring and Disaster Estimation for Kerala Government

THE TEAM

DR. VISHNU V NATH

C.T.O

PhD
10 years of research experience in the UAV designing and manufacturing.

SUJAI K J

Head Marketing & Operations

MBA

DENNY POULOSE

Head Design

MCA

MENTORS

Prasad B Nair - CEO, Makervillage

Rohan Kalani - COO, Maker Village

V R Narayanan _ Head - SMT Assembly Line & Operations, Maker Village

Dr. Muralikrishna - Scientist , NPOL DRDO

Ramadevi M - Scientist G, NPOL DRDO

Dr. Sam Thomas - Professor, CUSAT,Cochin

Muralee Thummarakudy - Chief, Disaster Risk Reduction, UNEP

AWARDS

Received the "Best Start-up" Award in Aerospace And Defence Sector at 11th Strategic Electronics Summit 2022

Received the "Excellence in indigenization" Award in Aerospace And Defence Sector at 11th Strategic Electronics Summit 2022

AWARDS

2021 GLOBAL WINNER

XPITCH

Number Pitch

People's Choice

WINNER OF

TIDE 2.0 investment

MeitY

Government of India

MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY GOVERNMENT OF INDIA

Digital India

Vocal for Local Tech

TOWARDS A SELF-RELIANT INDIA

UAV Drones that can Fight COVID-19, designed and developed by Kochi based AI Aerial Dynamics

GALLERY







MEDIA





PRESS & MEDIA

Anu Kuruvilla

FLYING HIGH ON DRONE TECH

While the world catches up on drone technology, a startup incubated at Maker Village, Kochi, have taken it one step further

Team AI Aeronautics with forest officials at Agali, Palakkad

> **We gave a demo to Kerala police. They want to use the product for surveillance, crowd monitoring and VIP security** – Vishnu V Nath, founder

IN A NUTSHELL

AI Aeronautics was started by four engineers six months ago.

It was set up with a seed investment of ₹15 lakh - most of which was pooled in by them and the rest was funded by the Government under Niti Prayas.

The Hybrid UAV that AI Aeronautics has developed can fly up to two hours within a 40 km radius.

The team is expecting a future investment of ₹10 to 15 lakh.

This team of four engineers is going great guns since the launch of the startup AI Aeronautics six months ago. It has been incubated at Maker Village, and is making waves not only in the domestic but also international market due to their penchant for customisation.

"The idea emerged while I was pursuing my PhD in Aerial Robotics and Artificial Intelligence. I even started building a UAV as a part of my academic project in 2016. However, the idea to launch a startup is a recent one," said Vishnu V Nath, founder and VP engineering. It was set up with a seed investment of ₹15 lakh. "The money was pooled in by us. Later, we got ₹10 lakh from the government as a part of Niti Prayas," he said.

Vishnu said the aim was to develop a viable product that matches the requirement of the customer at a minimal cost. "We build a customised flying platform that can be used in reconnaissance, aerial 3D mapping for survey, smart agriculture and disaster management," he said. The efficiency of the product was proved during a recent demonstration that was held for the State Disaster Management Authority, he added.

"Our drone carried out an aerial 3D mapping in the areas which had been affected by the floods. The mapping helped predict the level to which water will rise if the dams are opened again. This, in turn, will help in disaster management," he said. Rescue missions can be planned accordingly, he added.

Vishnu said the police and forest departments have also approached him. "We gave a demo to Kerala police. They want to use the product for surveillance, crowd monitoring and VIP security.

Features like the ability to downlink high-resolution real-time videos, an artificial intelligence-based algorithm to detect and track the number plates of suspect vehicles and also identify persons of interest through facial recognition make our product very attractive to the law-enforcement departments," said Vishnu.

The hybrid UAV that AI Aeronautics has developed can fly up to two hours within a 40 km radius. "The mission is controlled from the Ground Control Station," he said. According to him, they had used the drones to deliver emergency kits and locate people who went missing during the flood that wreaked havoc in the state in August 2018. "We deployed our drones at North Paravur," he said.

The drones were also pressed into service to track a wild elephant which had attacked a residential area at Kuthanapilly in Palakkad. "We also worked with the Archaeology Department for a pilot project in which the UAVs were used for aerial mapping and disaster estimation by creating a map of the Aranmula Parthasarathy Temple," said Vishnu.

At present, the startup is doing a research project with IIT-MK. "We have also successfully tested a prototype for DRDO in association with NPOL. The DRDO project is worth ₹20 lakh. Another work amounting to Rs 8 lakh was done for a virtual reality company," he said. According to him, the projects in the pipeline are a prototype that can carry a payload of one kilo. "Two other projects for prototypes that can carry five kg and 24 kg payloads too are underway. The one that can carry the 24 kg payload is for the DRDO," he said.

The team is expecting a future investment of ₹10 to 15 lakh. "We want to use the domain efficiently. Also, we have been asked by Walmart to use the drones to help solve their space management issues," he said.

പറന്ന് പനി നോക്കാൻ 'ഗരുഡ്'

- ഡ്രോൺ വികസിപ്പിച്ചത് കൊച്ചി മേക്കർ വില്ലേജിലെ സ്റ്റാർട്ടപ്പ്
- അണുനാശിനി തളിക്കാനും അവശ്യ സാധനങ്ങൾ എത്തിക്കാനും സൗകര്യം

മിൽജിത് രവീന്ദ്രൻ

തിരുവനന്തപുരം

ആകാശത്തുനിന്ന് പനിയളക്കും. വേണമെങ്കിൽ അണുനാശിനി തളിക്കുകയും അവശ്യസാധനങ്ങൾ എത്തിക്കുകയും ചെയ്യും. പറന്നുനടന്ന് നിരീക്ഷണം നടത്താനും ആളുകൾക്ക് നിർദേശം നൽകാനും പൊലീസിനെ സഹായിക്കാനുമെല്ലാമാണ് ഈ ഗരുഡൻ. കളമശേരി മേക്കർ വില്ലേജിലെ 'എഐ എരിയൽ ഡൈനാമിക്സ്' സ്റ്റാർട്ടപ്പാണ് കോവിഡ് പ്രതിരോധത്തിൽ തുണയാകാൻ ഡ്രോൺ 'ഗരുഡ്' വികസിപ്പിച്ചത്. നിർമിത ബുദ്ധിയധിഷ്ഠിതമാണ് അണ്മാൻഡ് ഏരിയൽ വെഹിക്കിൾ (യുഎവി) 'ഗരുഡ്' റെഡ്ഡി പ്രവർത്തനം.

റോഡ്, ഇടവഴി, വാസസ്ഥലം, വിമാനത്താവളം എന്നിവിടങ്ങളിൽ നിരീക്ഷണം നടത്താൻ ഗരുഡിനാകും. തെർമൽ ഡാറ്റാ സമ്പാദനം, എഐ സഹായത്തിലുള്ള എന്നിവ ഉപയോഗിച്ച് പകർച്ചവ്യാധി വ്യാപനം അറിയാനും സാധിക്കും. അടിയന്തര ഘട്ടങ്ങളിൽ മനുഷ്യ ഇടപെടലില്ലാതെ സ്വയം സഞ്ചരിക്കാനും ശേഷിക്കും. 60 കിലോയോളം ഭാരം വഹിക്കാനാകുന്നതിനാൽ അവശ്യസാധന വിതരണത്തിനും ഉപയോഗിക്കാം. ആകാശത്തുനിന്ന് അണുനാശിനി തളിക്കാനുള്ള ആധുനിക സ്പ്രേയറും ഉണ്ട്. ഗരുഡിലെ ഉപഗ്രഹവിനിമയത്തെ നിയന്ത്രിക്കാനും സൗകര്യമുണ്ട്.

നിർമിക്കുന്നതിനുപയോഗിക്കുന്ന എൻജിൻ, കൃത്രിമ ഓസല്യൂഷൻ ക്യാമറ, മൈക്രോ സ്പ്രേയർ, തെർമൽ സ്കാൻ എന്നിവ ഗരുഡിലുണ്ടെന്ന് കമ്പനിയുടെ സിഇഒയും സഹസ്ഥാപകനുമായ വിഷ്ണു വി നാഥ് പറഞ്ഞു. ഒരു സെൻസിറ്റിവിറ്റിയുള്ള കാര്യങ്ങൾപോലും ഗരുഡിന് തിരിച്ചറിയാനാകും. കുറ്റവാളിയെ ദൃശ്യങ്ങൾ അയയ്ക്കുന്നതിൽ കേന്ദ്രത്തിൽ ശേഖരിക്കും. ബാറ്ററി തീരുമ്പോഴോ വെയ്ൽ നഷ്ടമായാലോ യാന്ത്രികമായി സ്വയം തിരികെയെത്തും. ഉപയോക്താക്കളുടെ ആവശ്യങ്ങൾക്ക് അനുസരിച്ച് ഗരുഡിനെ ഇഷ്ടാനുസരണം രൂപകൽപന ചെയ്യാനും സാധിക്കും.

An eye in the sky to weed out ganja

Forest dept. to deploy AI-driven drones to detect cultivation inside jungles

Members of the start-up Artificial Intelligence Aeronautics presenting their drone developed for the detection of ganja farms tucked away deep inside forests.

Drone revolution: Kochi-based startup helps cops enforce lockdown

ANU KURUVILLA

The unmanned aerial vehicle built by startup AI Aerial Dynamics

TOWARDS A SELF-RELIANT INDIA

UAV Drones that can Fight COVID-19, designed and developed by Kochi based AI Aerial Dynamics

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