



Technology DJI/Mavic Phantom comparison

Computer Science

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Outline

- **Introduction**
- **Technology Analysis**
- **Industry Analysis and Competitor Analysis**
- **Advance Applications**
- **Conclusion**
- **References**

Introduction Drones

- **UAV** (unmanned aerial vehicle), also called **Drone**, means an aircraft **without any human pilot, crew, or passengers on board.**
- Quadrotor aircraft (or quadcopter) is a type of helicopter with four rotors.
- Nowadays, there have many applications related to drones. For example, real-time video stream for mountain rescue helping, live firework show with drones, and racing drone



Introduction DJI

- DJI (Da-Jiang Innovations, 大疆創新) is the China tech company that manufactures commercial **UAV** (drones) for **aerial photography** and **videography**
- It also designs and manufactures camera gimbals, action cameras, camera stabilizers, flight platforms, propulsion systems and flight control systems.
- Until 2020/10, DJI has over 80% market share in the global civil and commercial drone market. Ranked No. 1 among global commercial drone companies





DJI's Drone Product Lines

- DJI Mavic Series – Industry-leading camera drones
- DJI Phantom Series - The groundbreaking DJI series



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DJI Mavic 3

- DJI Mavic
 - Portable consumer-grade aerial photography drone
 - Target Audience
 - Non-professional flight controllers
 - High quality photography
 - Easy to use with smart technology features





DJI Mavic 3 - Spec

■ Physics Specs

- Weight: 895 g
- Size (expand): 347.5 mm x 283 mm x 107.7 mm
- Speed
 - Max Ascent Speed: 8 m/s (S mode)
 - Max Descent Speed: 6 m/s (S mode)
 - Max Flight Speed (at sea level, no wind): 19 m/s (S Mode)

■ Flight time

- Max Flight Time (no wind): 46 minutes
- Max Hovering Time: 40 minutes
- Max Flight Distance: 30 km

■ Gimbal

- Stabilization: 3-axis motorized (tilt, roll, pan)

DJI Mavic 3 - Spec

Hasselblad Camera

- Sensor: 4/3 CMOS, Effective pixels: 20 MP
- Lens
 - FOV: 84°
 - Aperture: f/2.8 to f/11
- Max Image Size: Main Unit: 5280×3956
- Still Photography Modes
 - Single shot: 20MP Photos
- Video Resolution
 - Apple ProRes 422 HQ, 422, 422 LT
 - 5.1K: 5120×2700@24/25/30/48/50fps
 - 4K: 3840×2160@24/25/30/48/50/60/120*fps
 - H.264/H.265
- 10 Bit D-Log



DJI Mavic 3 - Spec

■ Tele Camera

- Sensor: 1/2-inch CMOS

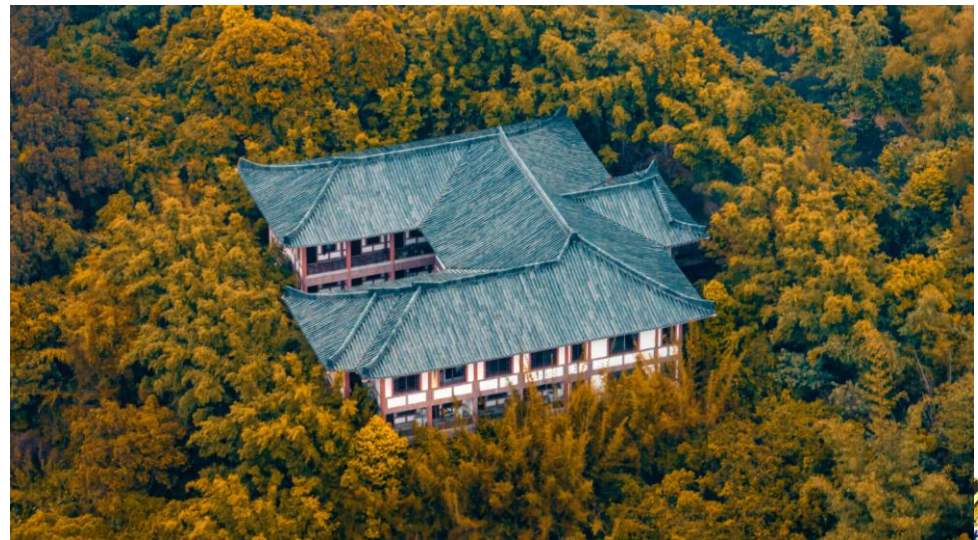
- Lens

 - FOV: 15°

 - Format Equivalent: 162mm

 - Aperture: f/4.4

- Single shot: 12MP Photos

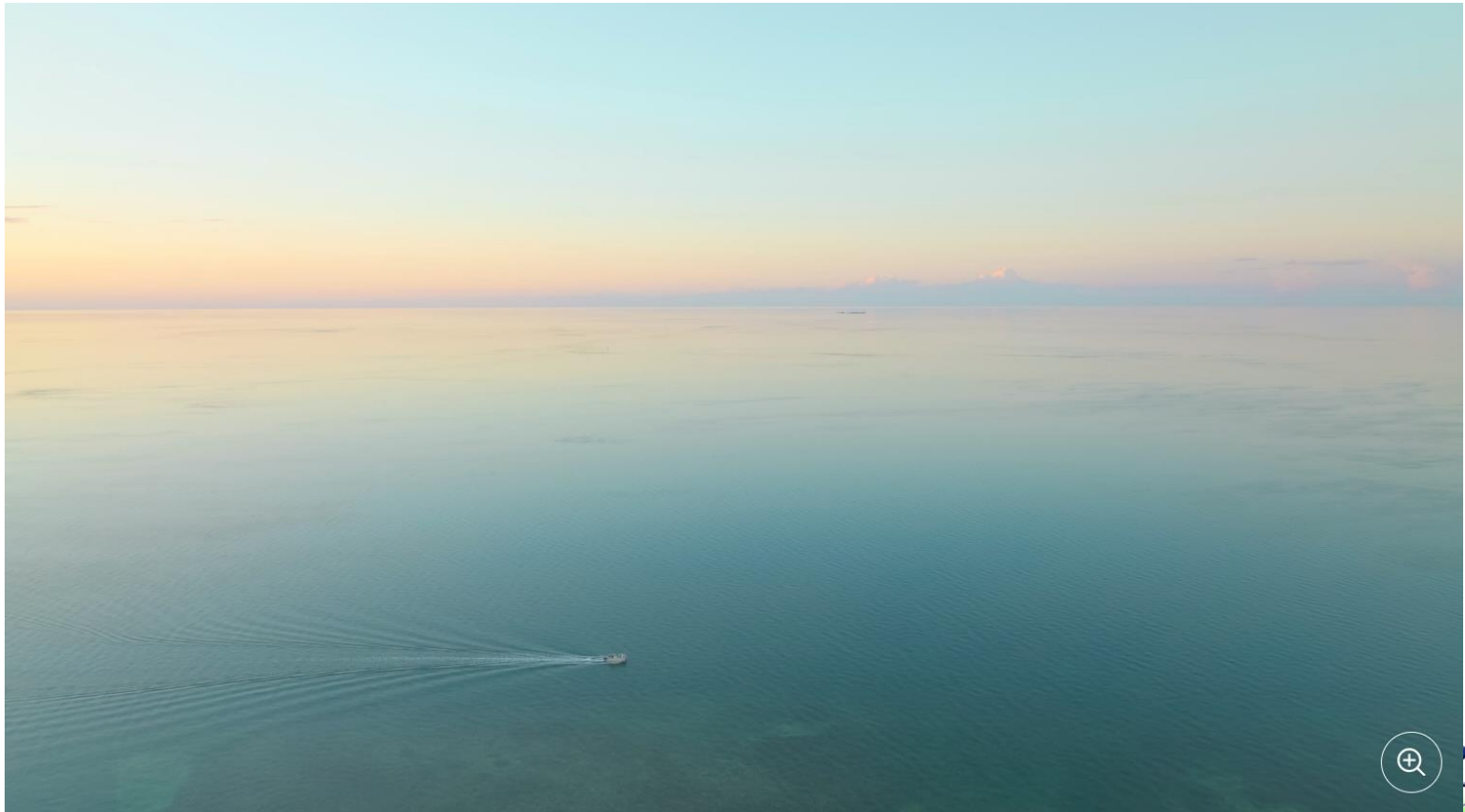


Hasselblad Camera Showcase



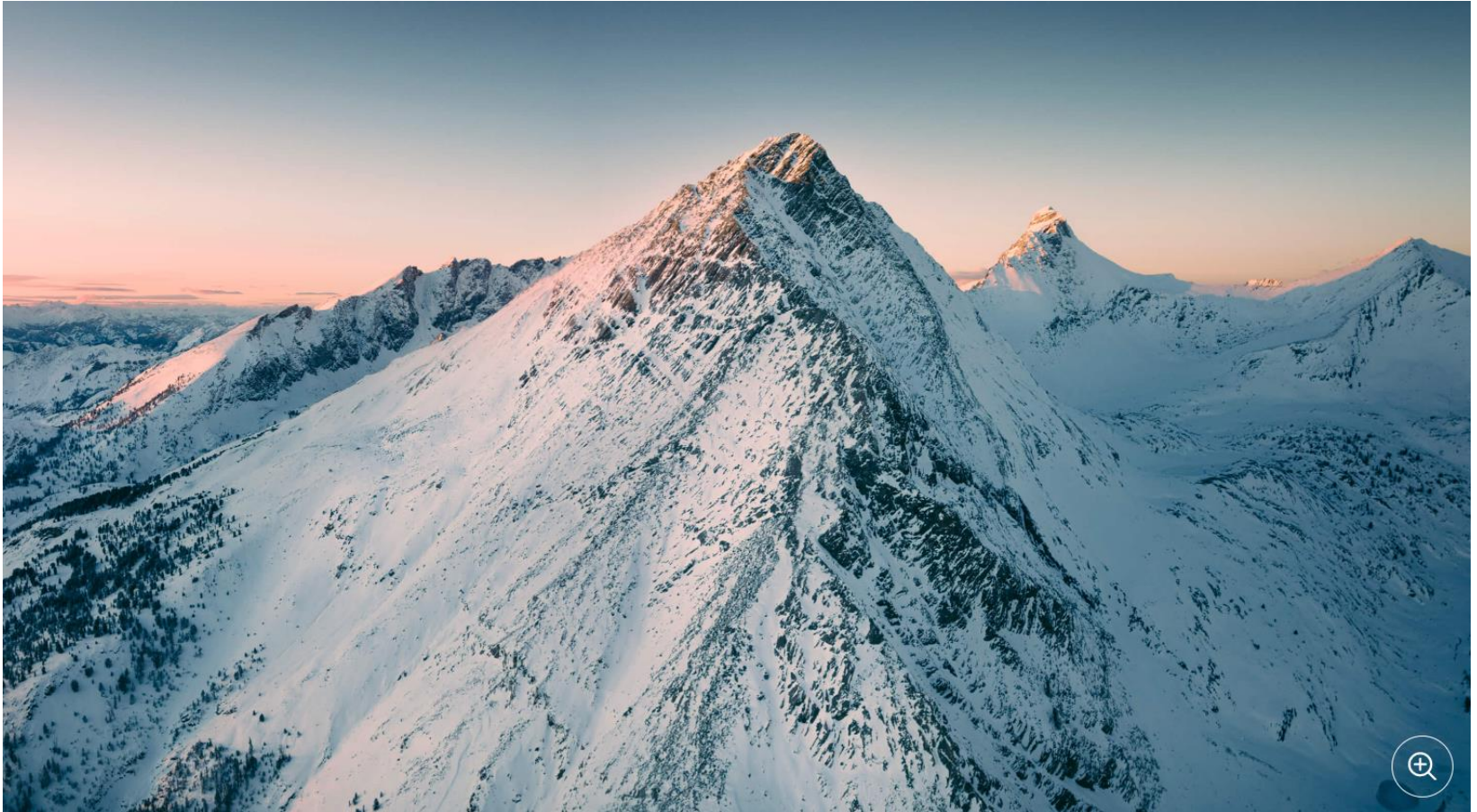
Hasselblad Camera Showcase

- Higher dynamic range allows for more natural transitions between highlights and shadows, preserving rich visual information with a greater sense of depth.



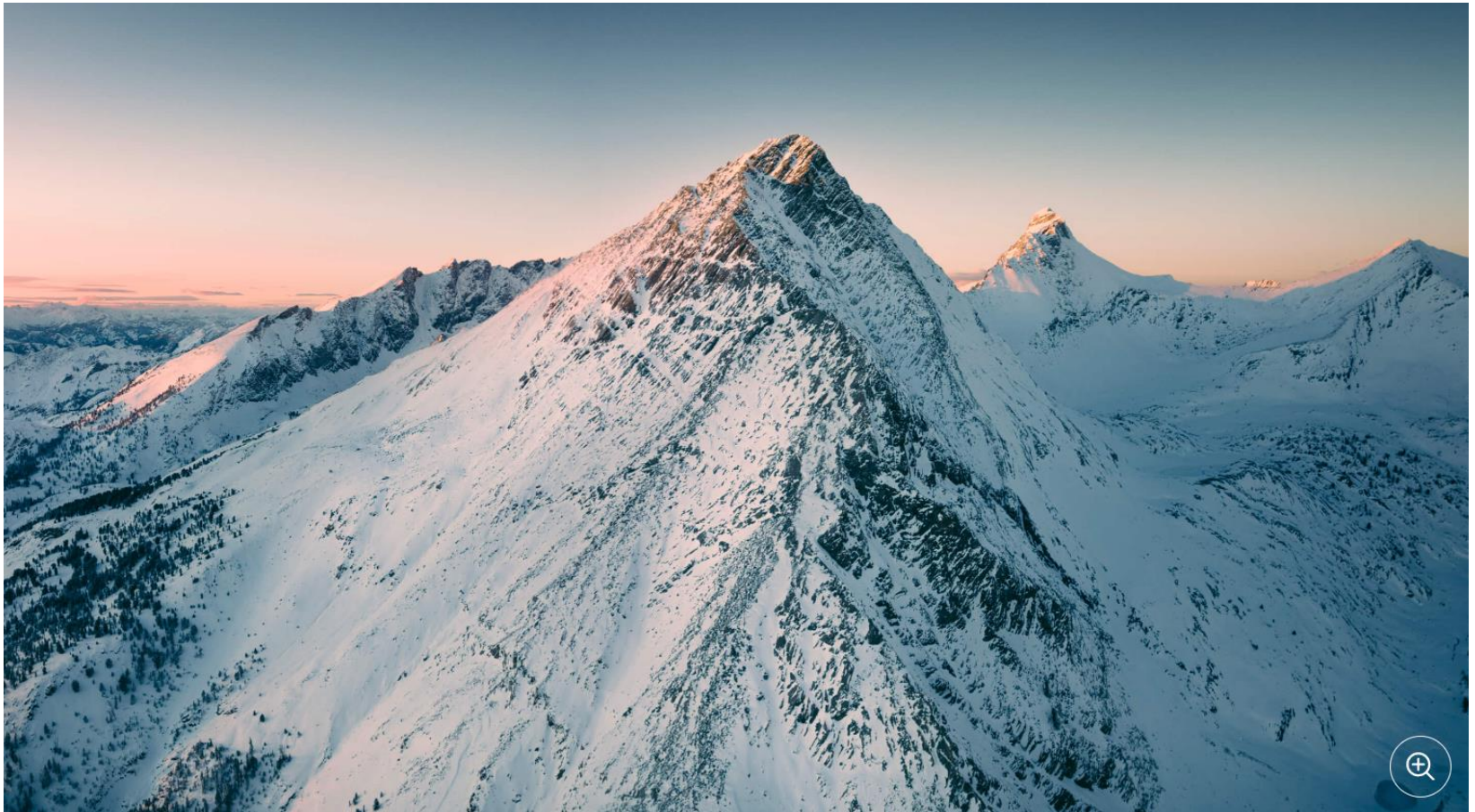
Hasselblad Camera Showcase

- A larger sensor size keeps images clean in low light.



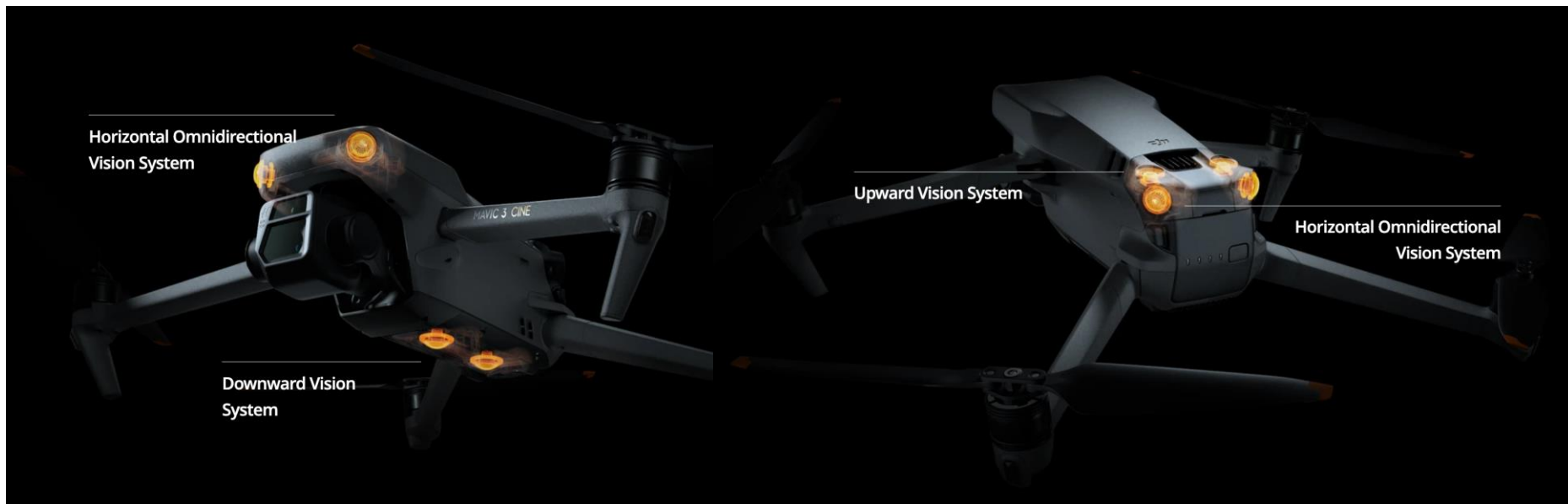
Hasselblad Camera Showcase

- A larger sensor size keeps images clean in low light.



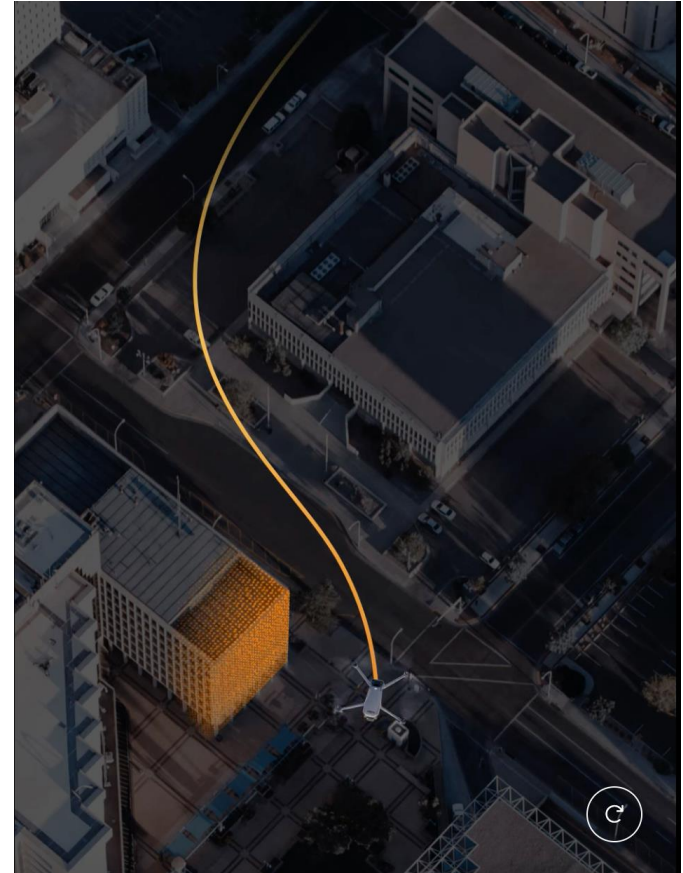
Omnidirectional Obstacle Sensing

- Mavic 3 helps you to enjoy collision-free flight so you can focus on getting the best shots possible
- Omnidirectional binocular vision system, supplemented with an infrared sensor at the bottom of the aircraft
- Sensor at Forward, Backward, Lateral, Upward, Downward



Advanced RTH (Return to Home)

- Mavic 3 to automatically determine the optimal route back to its home point and execute it quickly.
- Combining the advantages of Advanced RTH and traditional RTH, allowing users to choose the best option according to their environment.
- Even the return route have building blocking, Mavic 3 also can execute RTH.



APAS 5.0 (Advanced Pilot Assistance Systems)

- When flying, Mavic 3 continually senses objects in all directions and bypasses them quickly and smoothly.
- Unlike the old solution of automatic obstacle avoidance system. APAS will compute the optimal route to avoid the obstacle without hover the drone.



APAS 5.0 (Advanced Pilot Assistance Systems)



DJI O3+ (OcuSync)

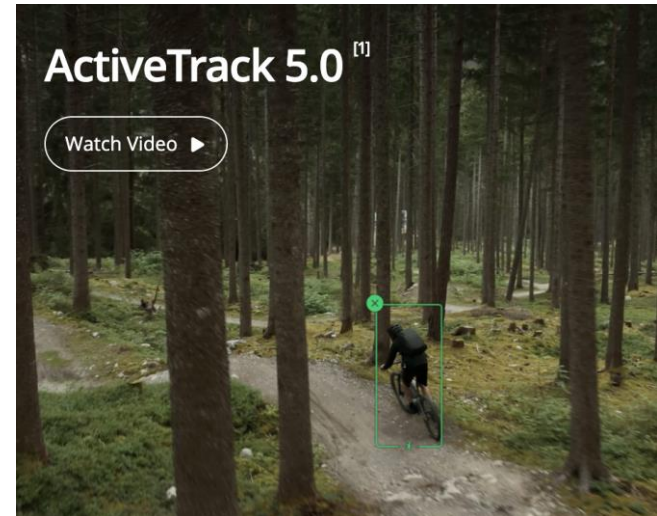
- Video Transmission over 15KM with 1080p/60fps live feed.
- Operation Frequency
 - 2.400-2.4835 GHz
 - 5.725-5.850 GHz
- Max Download Bitrate
 - O3+:
 - 5.5MB/s (with RC-N1 remote controller)
 - 15MB/s (with DJI RC Pro remote controller)
- Also, it has Cellular module can connect to 4G to enhance the safety of flights.



DJI RC Pro

Automated Flight

- The Waypoint Flight function
 - Automatically plan a flight route based on the waypoints preset by the user, and can precisely repeat routes.
- Cruise control:
 - Control Mavic 3 to fly in any direction without having to continually press the control sticks.
- ActiveTrack 5.0
 - Automatically track the object and flying.
- MasterShots, Panorama, Hyperlapse, QuickShots....



Video Shots Showcase



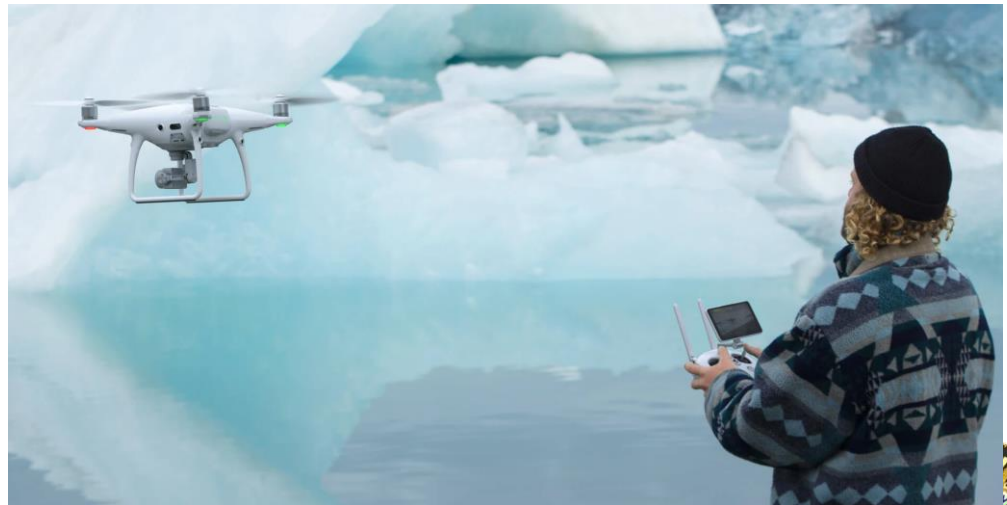


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Phantom 4 Pro V2.0

- DJI Phantom
 - Professional photography drone
- Target Audience
 - Professional Video creator
 - Professional aerial photographer





Phantom 4 Pro V2.0 - Spec

- Physics Specs
 - Weight: 1375 g
 - Size:
 - Max Ascent Speed: 6 m/s (S Mode)
 - Max Descent Speed: 4 m/s (S Mode)
 - Max Speed: 72 kph (S Mode)
 - Max Flight Time: Approx. 30 minutes
- Gimbal
 - Stabilization: 3-axis (pitch, roll, yaw)
- Vision System:
 - Forward, Backward, Downward
 - Infrared Sensing System
- Transmission
 - OcuSync 2.0 HD
 - Can connect wirelessly to the DJI Goggles

Phantom 4 Pro V2.0 - Spec

■ Powerful Aerial Performance

■ Sensors

- 1-inch CMOS
- Effective pixels: 20M

■ Lens

- FOV 84°
- 8.8 mm/24 mm
- f/2.8-f/11
- auto focus at 1 m-∞

■ PIV Image highest Size

- 4096×2160 (4096×2160 24/25/30/48/50p)

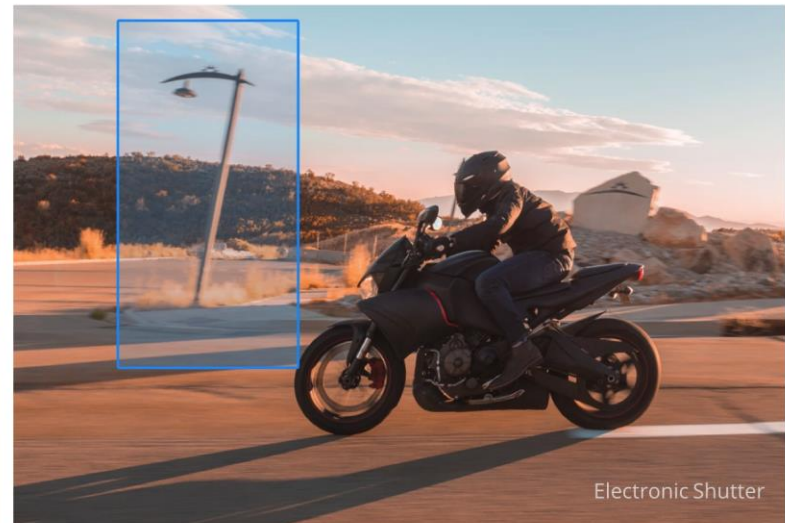
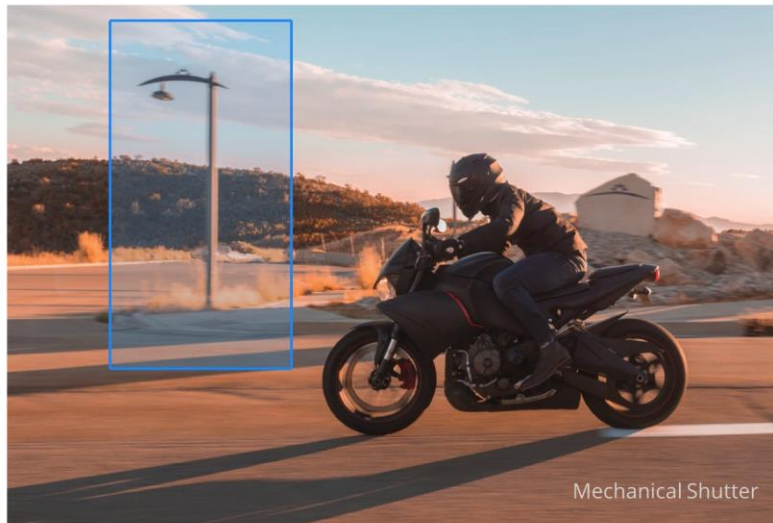
■ Professional 4K Video

- Bitrate: 100 Mbps
- Frame Rate: 4K/60fps
- Color Profile: D-Log



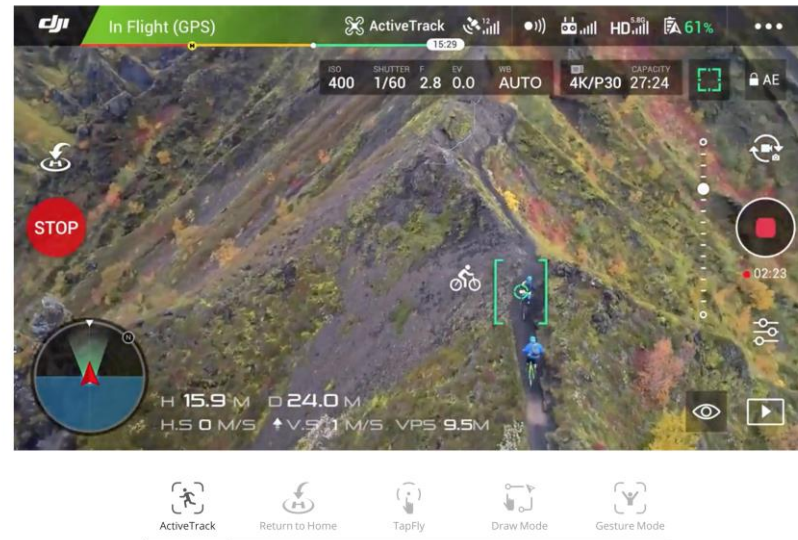
Precise Mechanical Shutter

- A mechanical shutter eliminates rolling shutter distortion which can occur when capturing fast-moving subjects or when flying at high speed.
- The electronic shutter features Burst mode, capable of shooting 14 fps at 20 MP to catch the perfect moment.



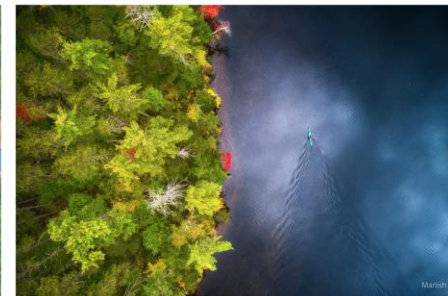
Intelligent Flight Modes

- ActiveTrack
- Return to Home
- TapFly
- DrawMode
- GestureMode



Professional Photography

- It is design for the professional aerial photographer, has a great camera module comparable to DSLR.
- Intuitive Remote Controller suitable for outdoor environment. As the DJI GO 4 app is built into the screen, a mobile device is not required

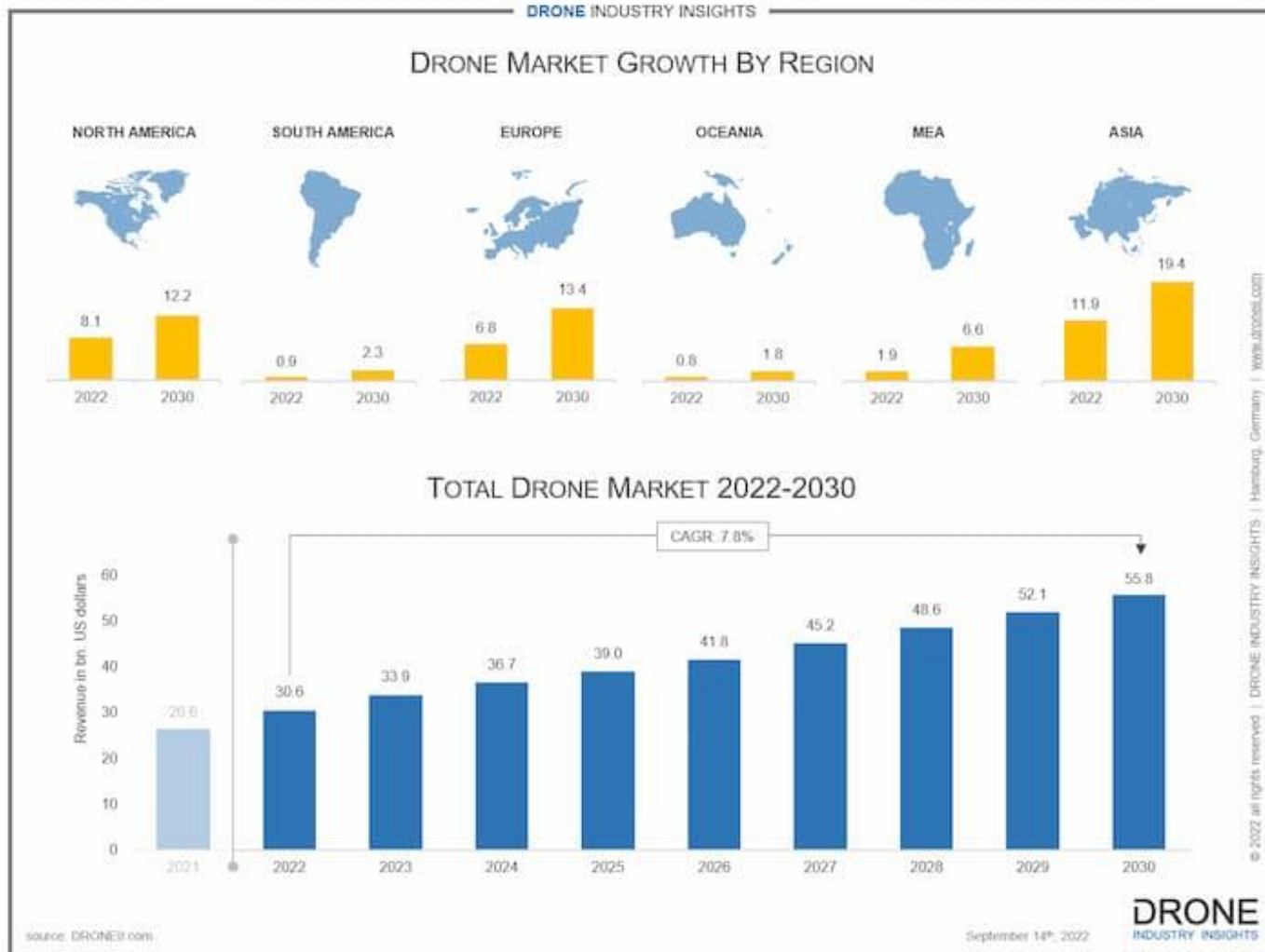




Outline

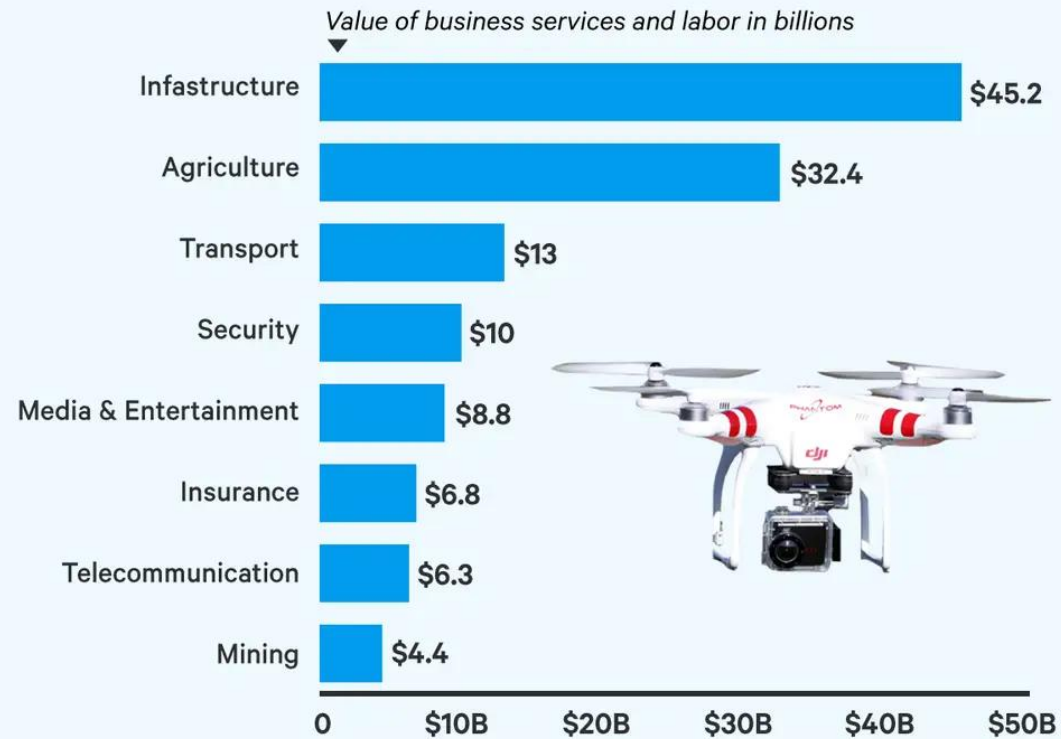
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Drone Market Analysis



Drone Market Analysis

Predicted value of drones by industry



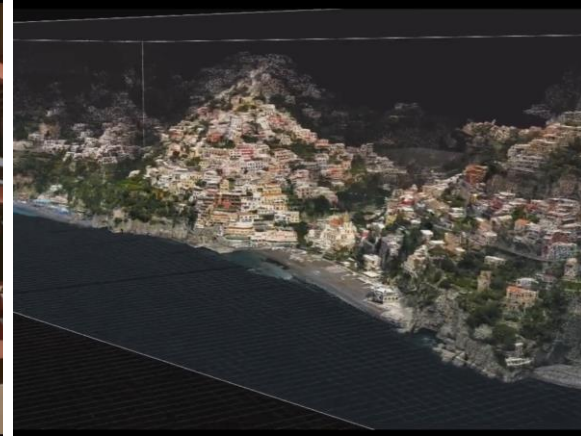
SOURCE: PwC

TECH INSIDER

Competitor Analysis – Parrot ANAFI Ai



Photorealistic
3D simulator



4G Internet Connectivity

Sets new standards for drones at work

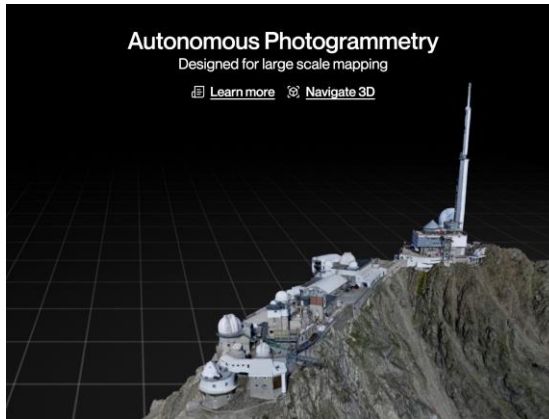
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Autonomous Photogrammetry

Designed for large scale mapping

[Learn more](#) [Navigate 3D](#)



A Unique Robotic Platform

Contributes to the open-source community

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Advance Applications

Solutions



Public Safety



Oil and Gas



Electricity



Aerial Surveying and AEC



Firefighting



Law Enforcement



Rescue Services

Advance Applications



Mavic 2 Enterprise Advanced



Matrice 300 RTK





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Conclusion

- DJI is a big commercial drones manufacturer in global
- DJI Mavic
 - A portable consumer-grade aerial photography drone with rich automation auxiliary functions in flight safety and photography
- DJI Phantom
 - Professional photography drone that suitable for professional aerial photographer
 - Less automation auxiliary functions but has a lens comparable to a DSLR
- Drones has a lot of application like public safety, rescue, agricultural, manufacture
- Drones market has good prospects



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Conclusion

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Conclusion

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