AutoJoe®

ALL-TERRAIN SIX WHEEL MOBILE ROBOT

RUGGED STRUCTURE

AutoJoe® is an agile six-wheel robot, fully electric, which can be remotely operated or run semi or fully autonomously to execute remote missions. The structure is made of high strength stainless steel plates and reinforced with inner plates for added durability. The main compartment is spacious and has plenty of room for sensors and electronics. AutoJoe® is designed to handle payloads of up to 100 kg, making it suitable for transporting heavy equipment and materials in challenging environments.

HIGH MOBILITY

AutoJoe® employs the well known and well tested NASA rocker-bogie suspension system. Combined with our innovative design of the bottom differential restrain, the robot is able to traverse extreme, desert-like rocky terrain. The design allows for balanced payload for smooth travel on protrusions as well as unusual surfaces.

SEAMLESS INTEGRATION

AutoJoe® is designed for seamless integration with existing systems and infrastructure, ensuring compatibility and interoperability. It supports various communication protocols, including Ethernet, Wi-Fi, and cellular networks, allowing for easy connectivity and data transmission. Additionally, AutoJoe® can be integrated with third-party software and hardware, providing flexibility and adaptability to different operational environment

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Applications

- Mining automation
  - **Tunnel inspection**: AutoJoe® can be used to remotely/autonomously underground post-blast to look for cracks and instabilities to ensure safe conditions for workers.
  - **Surveying**: Combined with a 3D laser scanner, our robot can be used for remote surveying of underground mines and tunnels, providing accurate data for mapping and assessment of mineral deposits.
  - **Hazard Detection**: AutoJoe® can be used to detect hazardous gases and other hazardous materials in the mine, enabling safe operations.
  - **Mapping**: The robot can be used to map underground mines, providing a detailed view of the environment.
  - **Exploration**: Explore and survey new areas of the mine with the robot, thus providing valuable data for further exploration.
  - **Sampling**: AutoJoe® can be used to collect samples of ores and other materials, enabling precise analysis and assessment.
  - **Transportation**: Transport materials and equipment in the mine with our tough robot, thanks to its 100 kg of payload, hence ensuring safe transportation and maximum efficiency.

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- Defense
  - **Remote Surveillance:** AutoJoe® can be used for remote surveillance of military bases, forward operating bases, and other critical infrastructure.
  - **Data Collection:** AutoJoe® can collect valuable data on the environment, enemy activity, and potential targets.
  - **Supply Delivery:** AutoJoe® can transport supplies and equipment to remote locations, reducing the need for human convoys and minimizing the risk of ambushes.
  - **Intelligence Gathering:** AutoJoe® can collect intelligence on enemy positions, activities, and equipment.
  - **Obstacle Detection:** The robot's advanced sensors can detect potential threats, such as mines, improvised explosive devices (IEDs), or enemy forces.
  - **CBRNE Tasks:** Robots can be equipped with sensors to detect, identify, and decontaminate areas affected by various CBRNE agents, providing early warning, allowing for appropriate response measures, and reducing the risk of exposure to human personnel.

- Search and Rescue
  - **Search and Rescue**: AutoJoe® can be used to autonomously search and rescue people trapped in hazardous environments, enabling rapid response and safe operations.
  - **Environment Monitoring**: Loaded with scientific instrumentation, the robot can monitor environments for hazardous materials and conditions, ensuring safety.
  - **Thermal Imaging**: With thermal cameras, the robot can detect heat sources and locate people in smoke and darkness.
  - **HD Cameras & Night Vision**: AutoJoe® can be fitted with high definition cameras for gauge reading, enabling it to detect small objects and features with 30x zoom.Night vision is possible with the proper night vision cameras, enabling it to see in the dark.
  - **Hazard Detection**: AutoJoe® can be fitted with hazard detection systems, enabling it to detect hazardous materials and conditions in the environment.

- Industrial Automation
  - **Logistics**: AutoJoe® can be used to autonomously manage the logistics of an industrial environment, ensuring efficient operations.
  - **Radiation Detection**: AutoJoe® can be fitted with radiation detectors, enabling it to detect and identify radioactive materials.
  - **Leak Detection**: AutoJoe® can be fitted with leak detection systems, enabling it to detect water or steam leaks and send out proper alerts.
  - **Noise Anomaly Detection**: AutoJoe® can be fitted with noise anomaly detection systems, enabling it to detect and identify unusual sounds in the environment.
  - **Robot-Human Collaboration**: AutoJoe® can be used to collaborate with humans on production lines, ensuring safe and efficient operations.
  - **Security**: AutoJoe® can be used to autonomously monitor and patrol industrial environments, ensuring safety and security.
  - **Inspection**: AutoJoe® can be used to autonomously inspect industrial equipment and facilities, ensuring their quality and safety.

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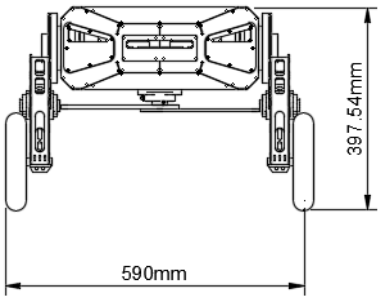
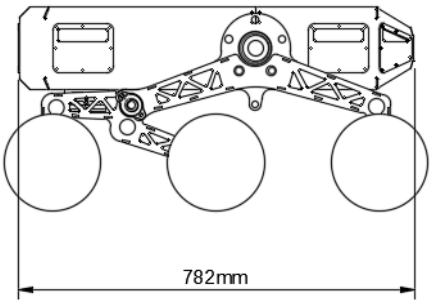
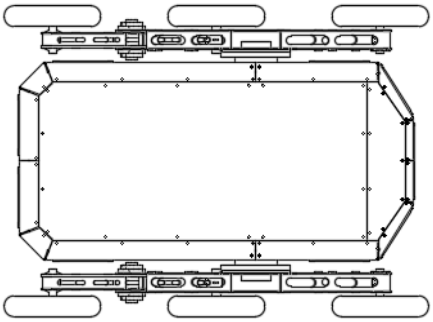
TECHNICAL SPECIFICATIONS



FRONT



SIDE


TOP

PHYSICAL DIMENSIONS	
DIMENSIONS (L x W x H)	782 x 590 x 397 mm (30.7 x 2.2 x 15.6 Inches)
WEIGHT (Batteries installed)	70kg (154.3 lbs)
GROUND CLEARANCE (with 6.5" wheel)	24 cm (9.4 in)

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PERFORMANCE	
MAX. PAYLOAD	100 kg (220.4 lbs)
MAX. INCLINE	20° inclines
MAX. SPEED	25 km/h (15.5 mph)
MOTOR TYPE	6x 8.5" Hub motor 400w
BATTERY	
BATTERY	LiFePO4 battery,Rechargeable LFP battery with built-in BMS
CAPACITY	20Ah at 36 V
CHARGE TIME	4-6hrs
NOMINAL RUN TIME	6 hrs Low & high temperatures may reduce operation time & power.
USER PAYLOAD POWER	5V, 12V (2 Amps), 36V (1 Amps)
COMMUNICATION & CONTROL	
CONTROL MODES	Remote control; direction & speed. Individual control of motors; velocity and torque.
STEERING MODE	Skid steering; 4WD, 6WD and possibility of individual wheel steering
FEEDBACK	Robot control system status, temperature, battery voltage, odometry by hall sensors. Optional: Radar data (front), 360° ToF sensors (Up to 4m)
COMMUNICATION	Ethernet, WiFI, **Optional**: 4/5G
MIDDLEWARE	ROS operating system
ADDITIONAL HARDWARE	Velodyne 3D LiDAR VLP-16, stereo camera, PTZ camera, IMU, front + corner lights, warning lights, onboard Jetson Nano, 3 E-stops
ENVIRONMENTAL	
OPERATING AMBIENT TEMPERATURE	-10 to 40 °C (-14 to 104 °F)
STORAGE TEMPERATURE	-10 to 40 °C (-40 to 104 °F)
IP RATING	N/A

Technical Specifications divergence and performance disclaimer

- Due to the prototype nature of this robot, the technical specifications mentioned herein are for reference only and actual specifications and performance of the robot may vary. Factors such as payload, environment operating in, battery running time, may differ from specifications.
- Some limitations here include but not limited to:
    - Speed: indoor: 1m/s or 3.6km/h, outdoor: 3m/s or ~10km/h
    - Payload: 100kg
    - Recommended operation is limited to non-condensing, low humidity environments.