Autonomous Mobile Robot system.

Scope / Objectives of the project:

Navigation: The ability of the robot to move from one location to another in an autonomous manner.

Perception: The capability of the robot to sense and interpret its surroundings, including objects, obstacles, and other environmental factors.

Mapping: The creation of a map of the environment for use in navigation and other tasks. Decision Making: The ability of the robot to make decisions based on the information it has gathered through perception and mapping.

Task Performance: The successful completion of specific tasks assigned to the robot, such as transportation, inspection, or manipulation, using the information gathered from the LIDAR sensor and the processing capabilities of the Nvidia Jetson processor.

Safety: The assurance that the robot operates in a safe manner, without causing harm to itself, other objects, or humans.

Reliability: The consistency and dependability of the robot's performance in carrying out its tasks.

Scalability: The ability to adapt the robot to new environments and tasks with minimal modifications.

METHODOLOGY

Sensing: The LIDAR sensor is used to gather information about the environment in real- time, including the distance and location of objects and obstacles.

Data Processing: The data collected by the LIDAR sensor is processed by the Nvidia Jetson processor to generate a map of the environment and to identify relevant features.

Path Planning: The robot uses the map of the environment and its objectives to plan an optimal path to reach its destination.

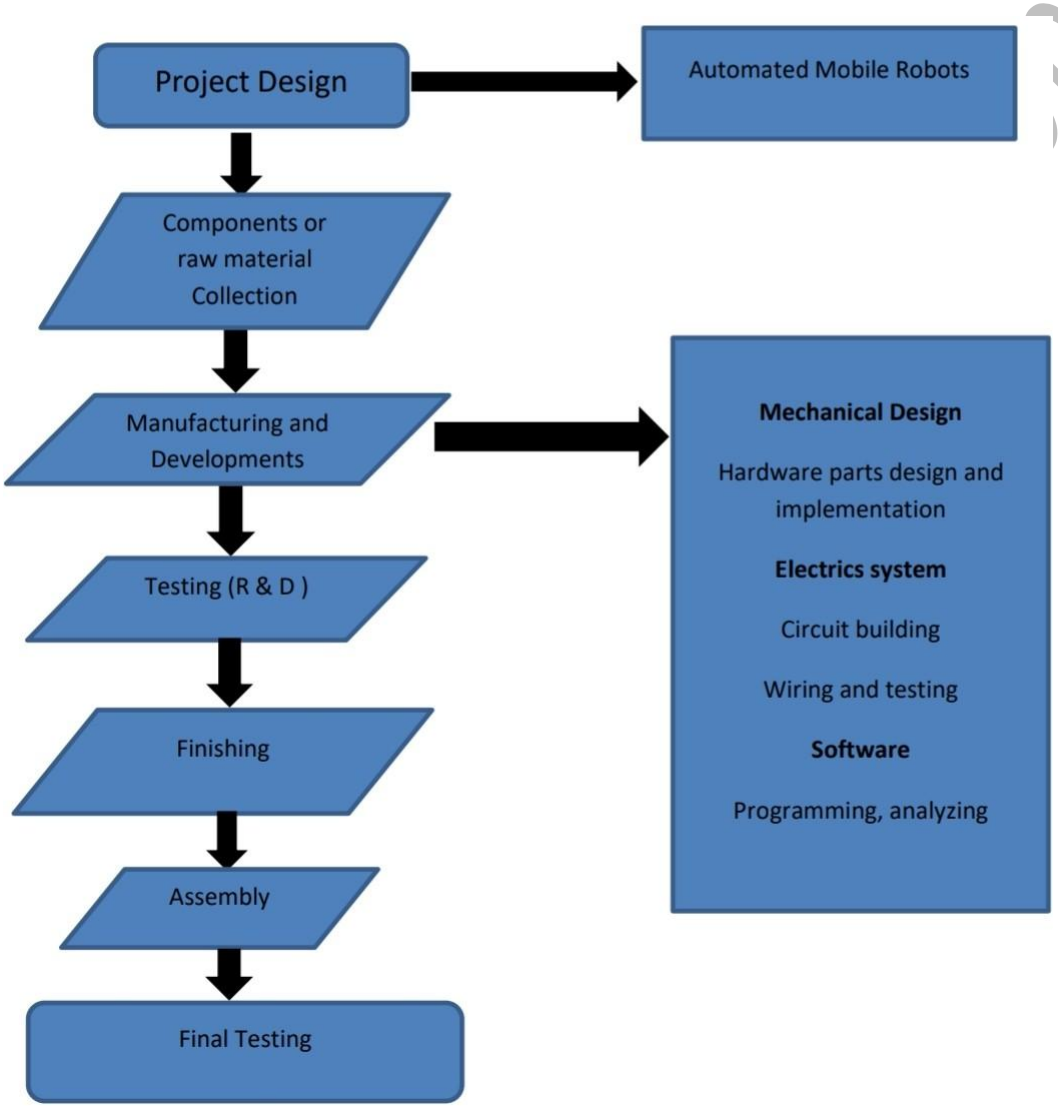
Motion Control: The Nvidia Jetson processor is used to control the robot's movements and ensure it follows the planned path.

Obstacle Avoidance: If the robot encounters obstacles during its path, it uses the data from the LIDAR sensor to dynamically adjust its path to avoid them.

Task Performance: The robot performs its assigned tasks, such as transportation or manipulation, using the information gathered from the LIDAR sensor and the Nvidia Jetson processor.

Monitoring and Feedback: The performance of the robot is monitored in real-time, and feedback is provided to adjust the robot's behavior and improve its performance.

System Improvement: Based on the data gathered and the feedback received, the system can be improved to enhance its accuracy, efficiency, and reliability.



3D CAD MODELLING

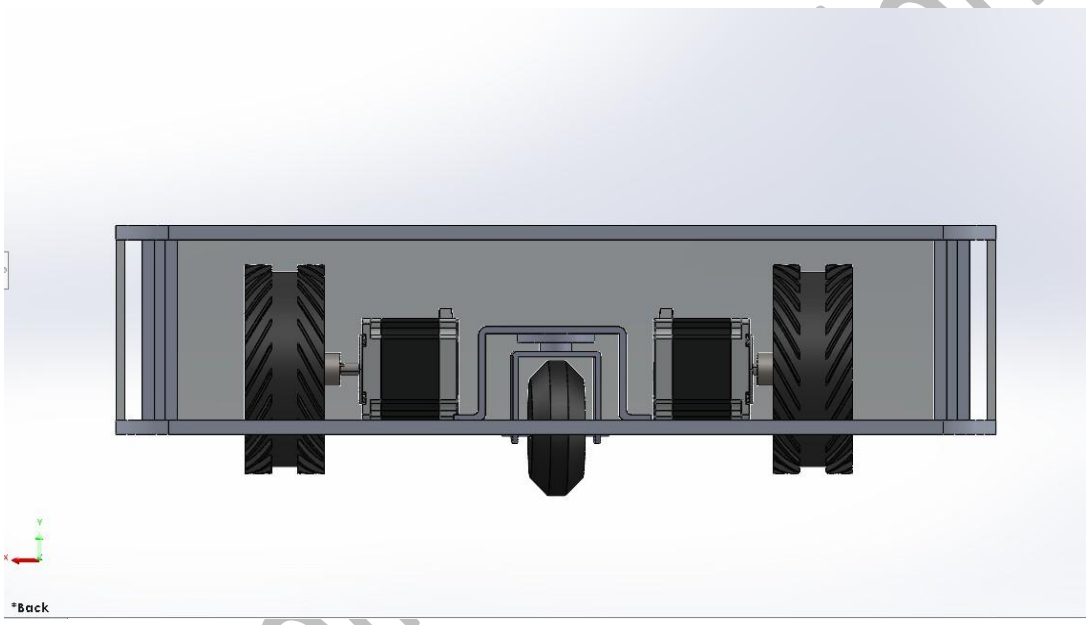
Computer aided design (CAD) is the use of computer system to assist in creation, modification, analysis or optimization of a design.

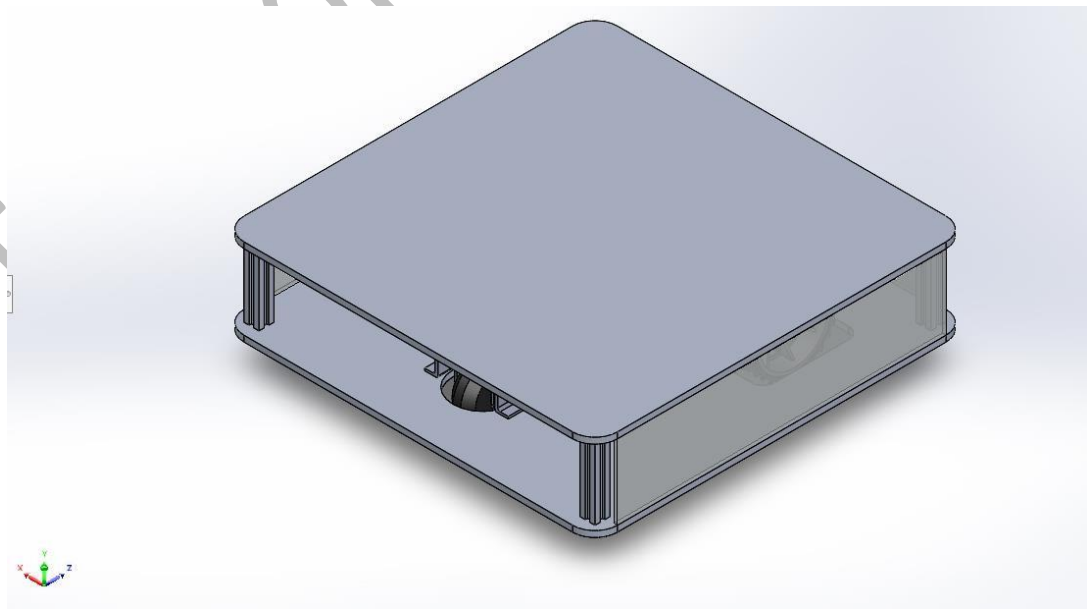
CAD software is used increase the productivity of the designer, improve the quality of design, improve the communication through documentation and to create a database for manufacturing.

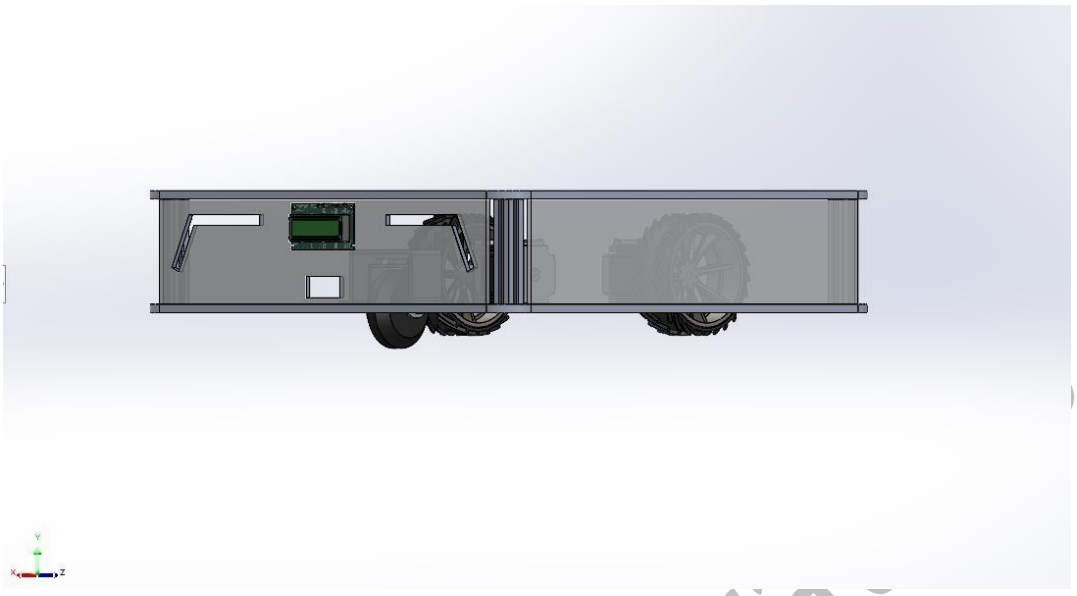
CAD is an important industrial art extensively used in many applications including automotive and aerospace.

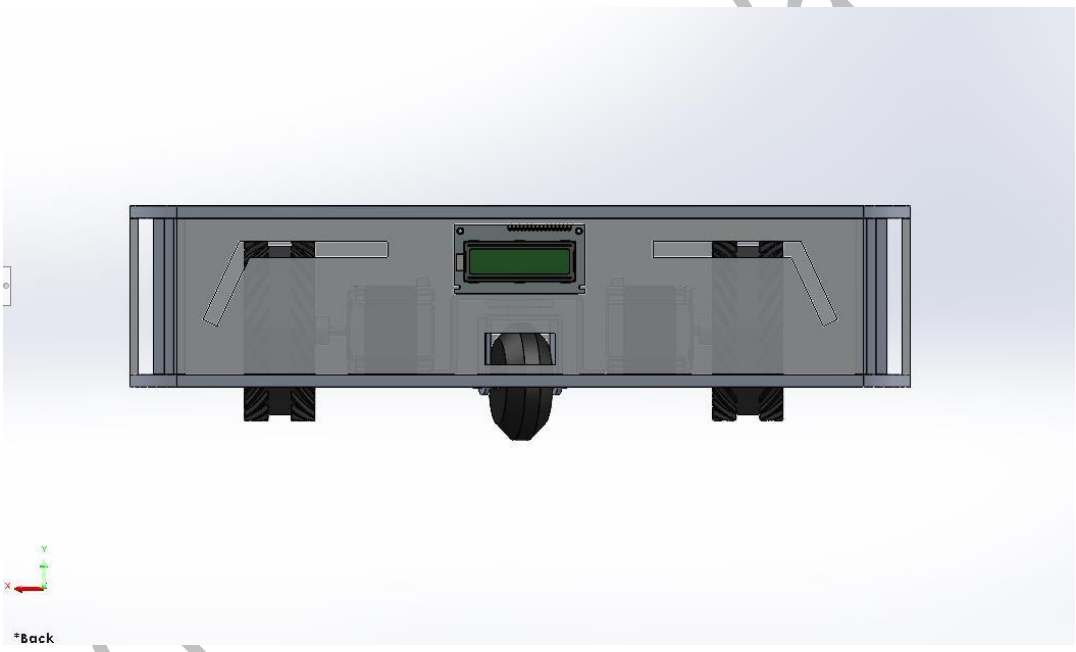
The model of AMR is designed using SolidWorks and the stress analysis is prepared using Ansys.

Body is designed separately and finally assembled all the parts.









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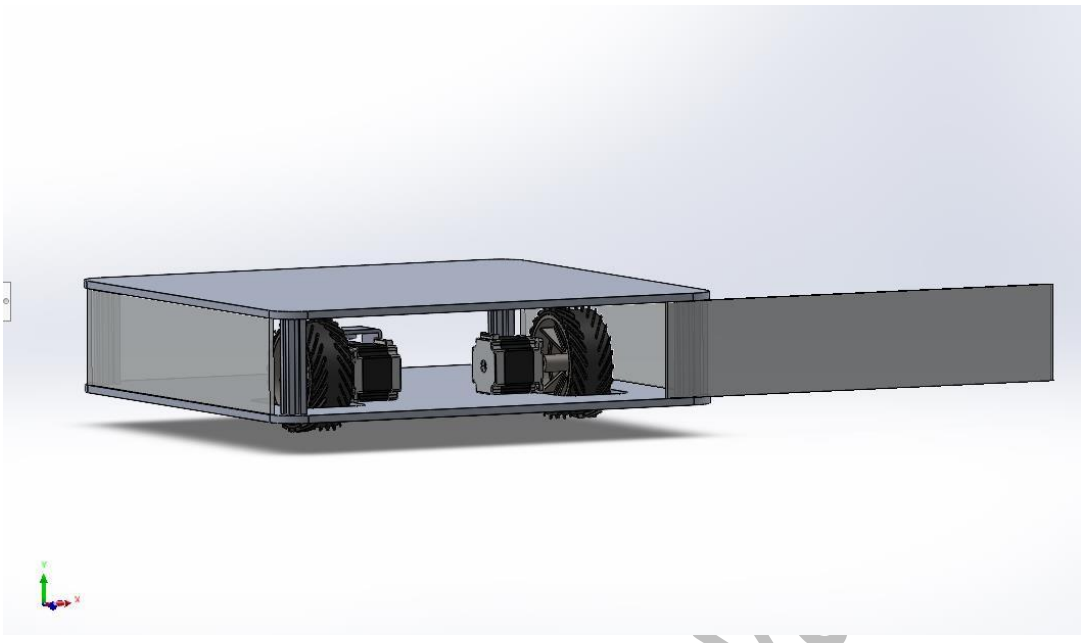

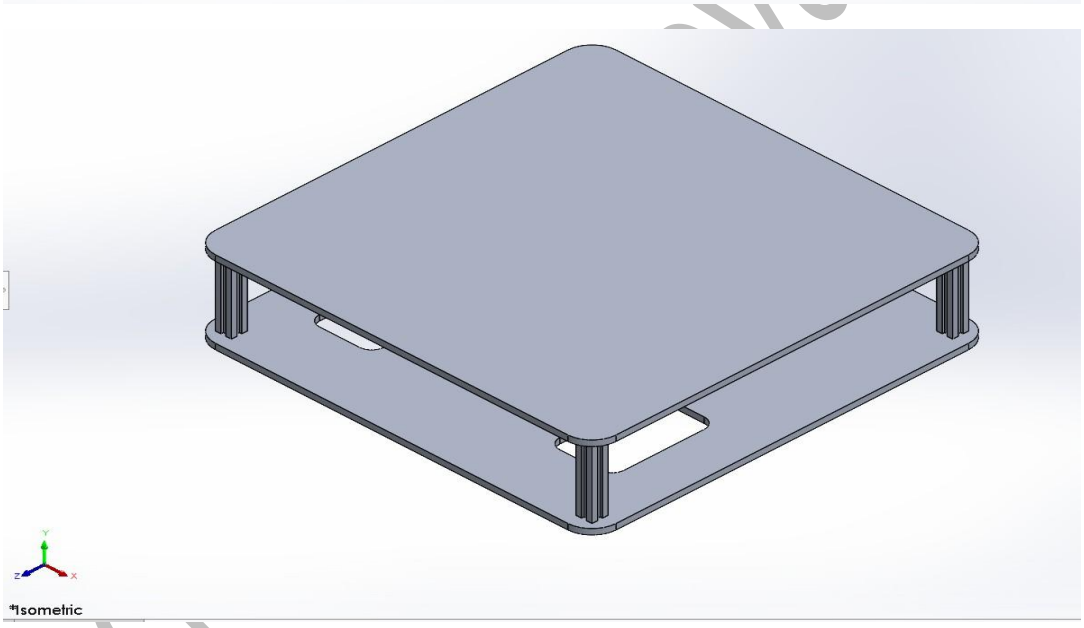
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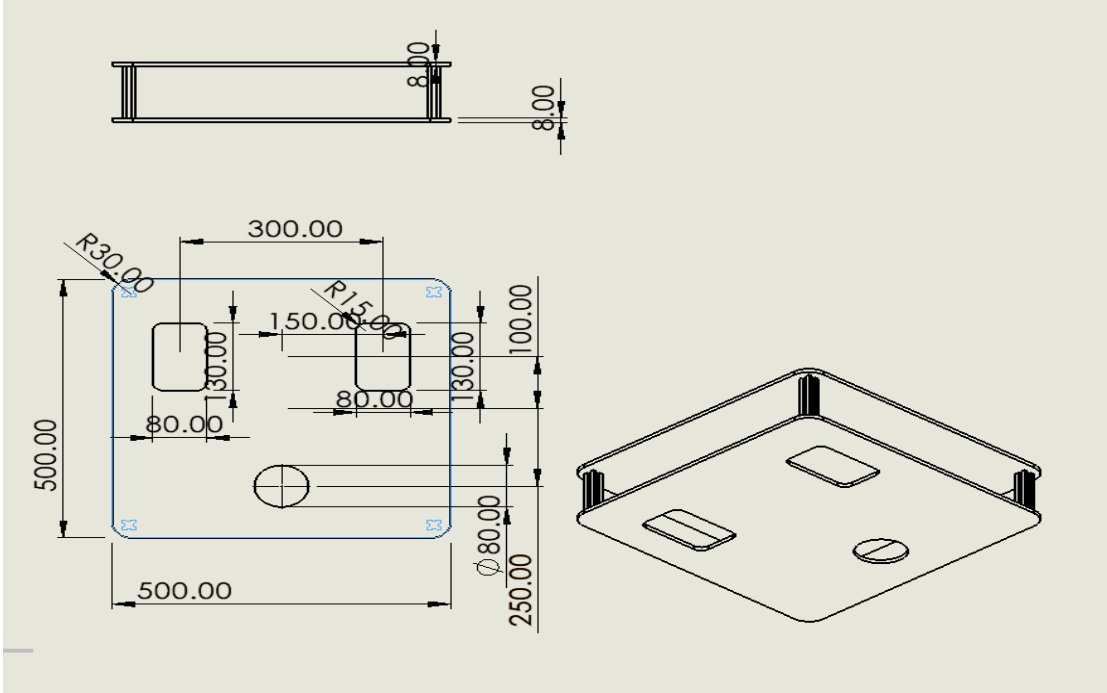


Dimensions of body

Length = 500mm

Breadth =500mm

Fillet =30mm

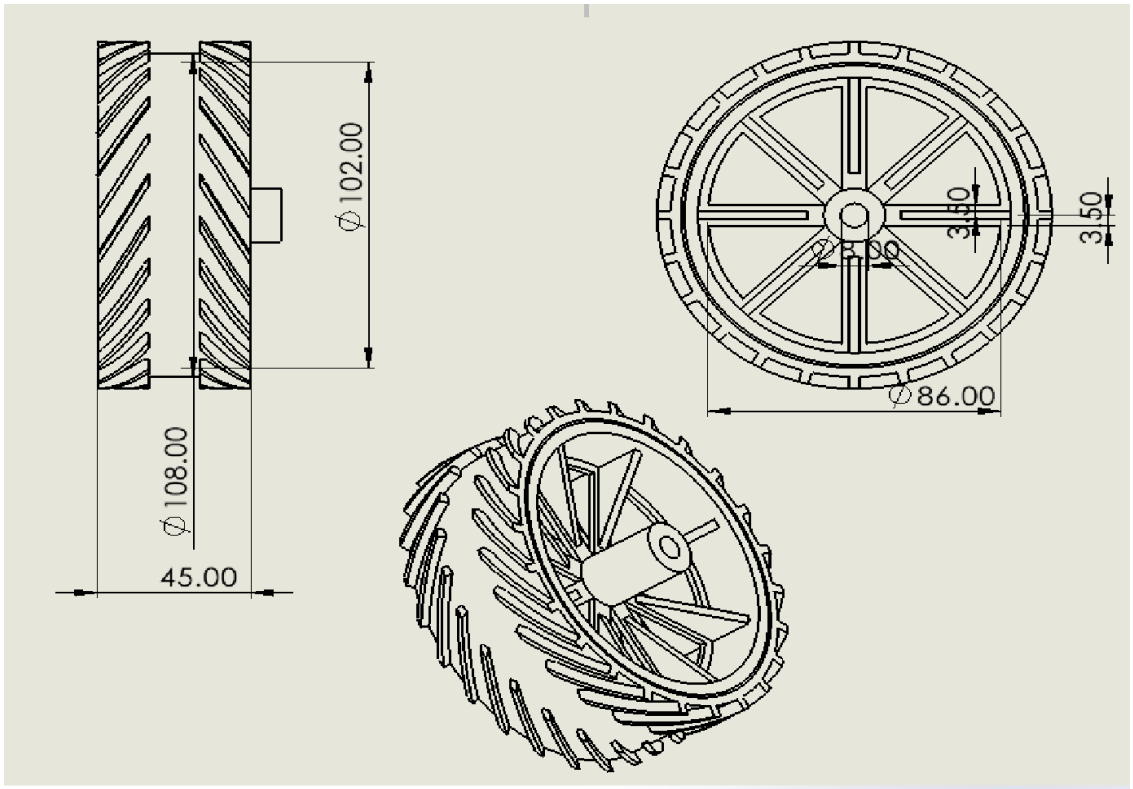
Thickness of sheet metal =8mm

Distance between the sheet metal =100mm Caster

wheel space =100mm

Spacing for wheels =80*30mm.

The body of the AMR is designed such that the gap is provided from side. so that circuit can be seen and ventilation can be provided for cooling and upper part is provided to carry weight and other accessories. Light aluminum alloy is used for fabrication.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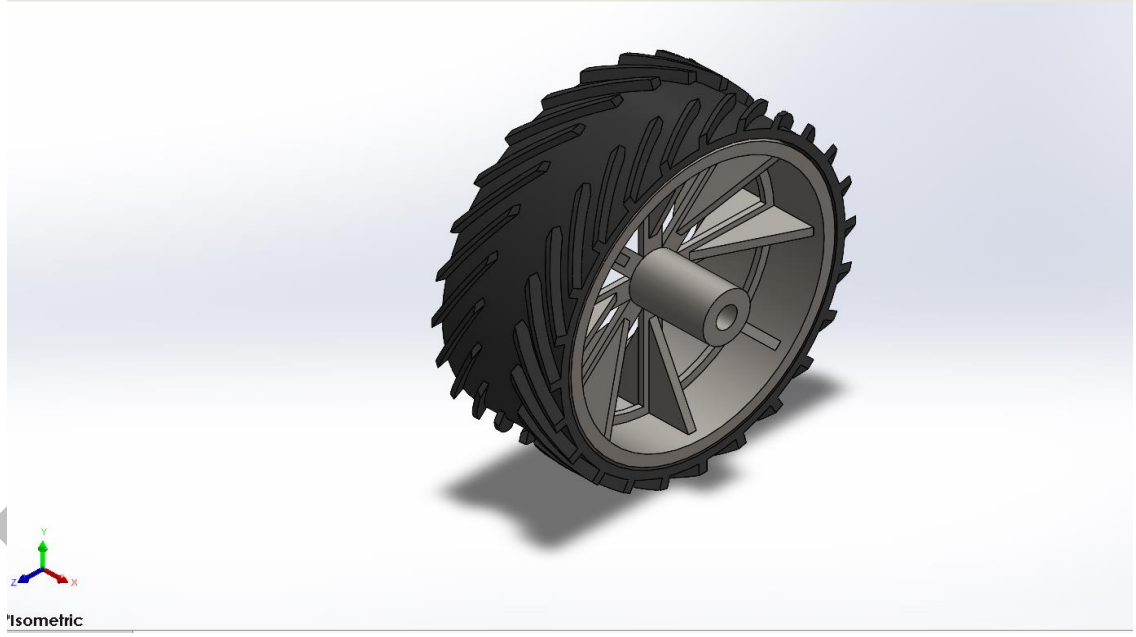
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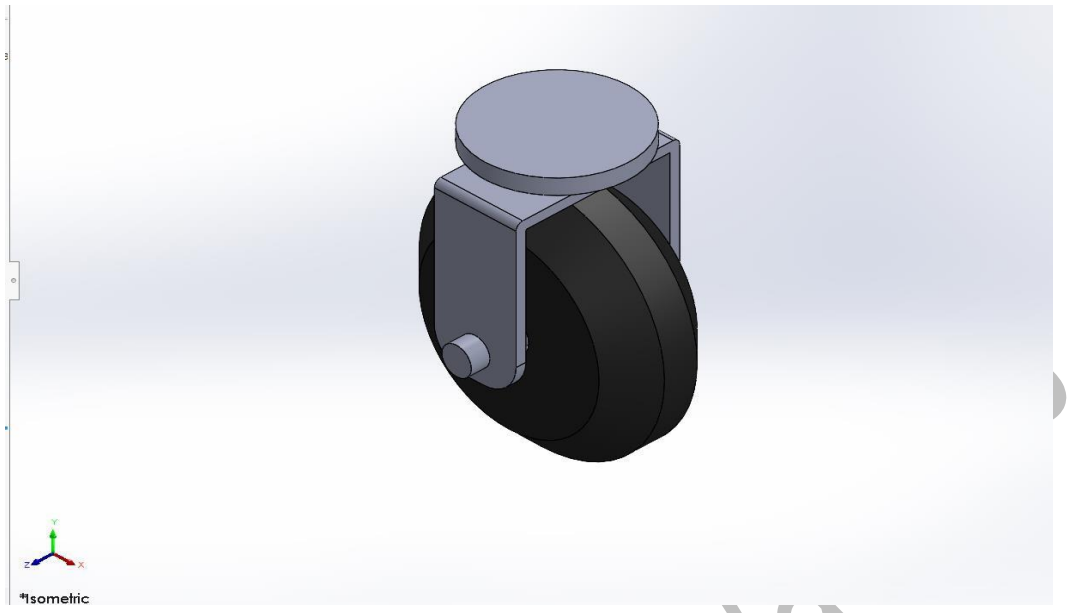
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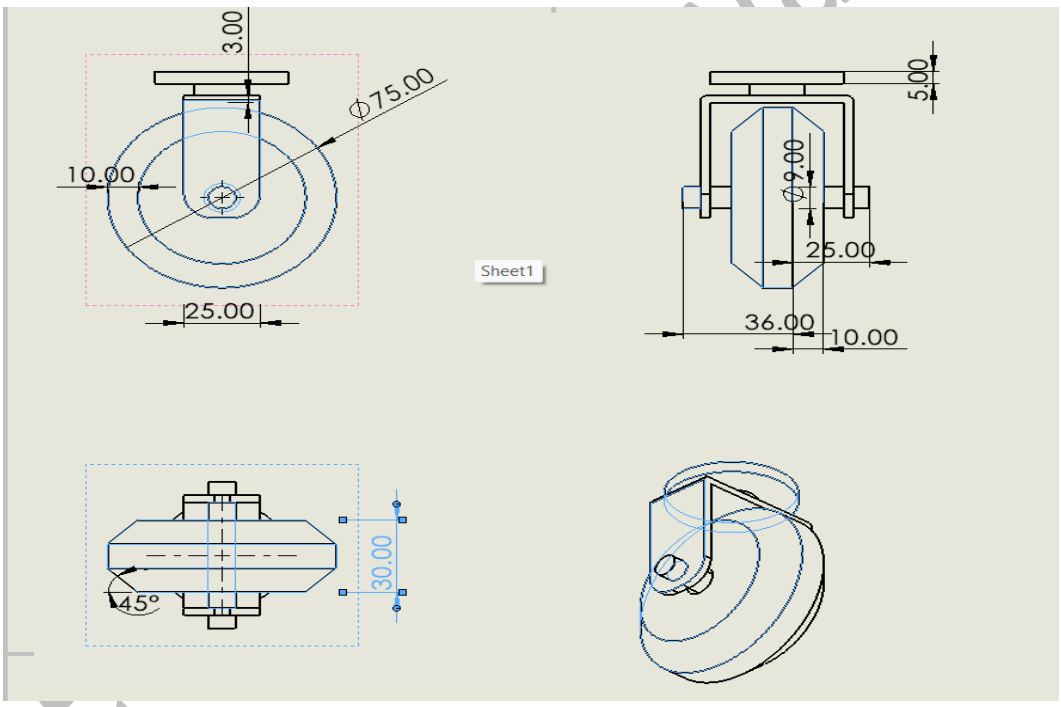
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