

Dual-Track Mobile Robot for Motion on Rough Terrain (BGN)

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Unmanned Ground Vehicles (UGVs) are being used in a variety of applications, including space exploration, military missions, agriculture, and subterranean missions. Tracked vehicles offer several advantages for motion on rough terrain, but their positioning and motion control is complex due to the nature of the slip during skid-steering. This invention is a dual-tracked robotic system comprising two tracked driving units configured to travel in tandem and a mechanical linkage mechanism that enables accurate localization and that may also allow forces to be transferred between the robot driving units.

Goals and Benefits

An autonomous robotic system capable of traversing rough terrain by allowing the robots to "help" each other via the mechanical linkage

Self-contained localization system for tracked robots, the accuracy of which depends on relative configuration measurements of the linkage mechanism and odometry

Modular design allows for utilization in tandem or as separate units

Rigid and robust design capable of reliable operation over time

Fiber optic communication and video transfer from the robot to a remote operator

Remote user interface enables simple control and inspection of the robot and its surroundings using two video cameras

Four operation modes: single, twin, follow, and autonomous

Potential Commercial Uses, market and potential strategic partners

The robot can be used for military and search and rescue applications. Specifically, the robot has been designed to map underground tunnels

The market for smart autonomous service robots is expected to reach sales of \$16 billion a year by 2025.

Development Stage and Development Status Summary

Two prototypes of the robot have been developed.


Extensive experiments showed that the robot is capable of traversing very rough terrain.

Mapping and control software and a user interface have been developed.

Patent Status

Patent Pending

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