DriVR

•Vehicle Controlled with Help of Virtual Reality Head-mounted Display

Objectives:

- create remote controlled model of vehicle operated with help of virtual reality device
- represent images of the real world as 3D environment in virtual reality device
- enhance operator's spatial awareness
- simplify control of vehicle
- provide 3D image of inaccessible space

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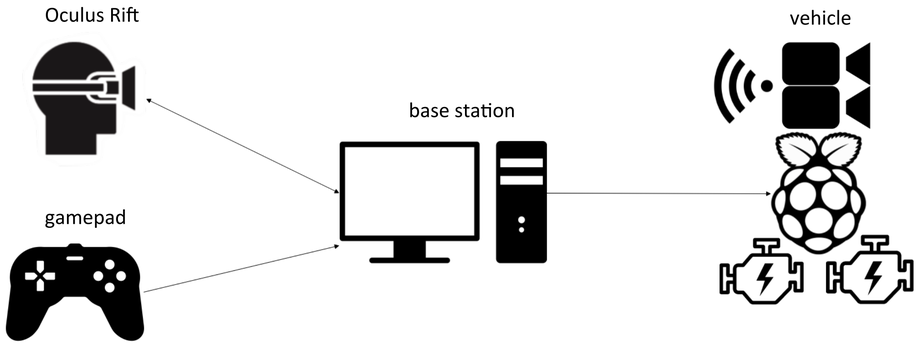
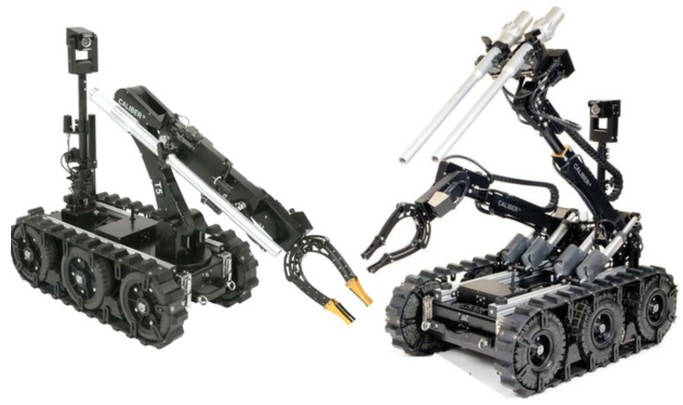


Design:

- the *vehicle* is equipped with two moveable cameras which are used to capture stereoscopic image required for binocular vision
- control commands are processed by single-board computer Raspberry Pi which determines the direction of vehicle and cameras
- the vehicle also transmits compressed video data and optionally sensory data via WiFi
- user wears the Oculus Rift *virtual reality head-mounted display*, which displays processed 3D image from both cameras
- by moving his head the user controls the position of both cameras simultaneously
- the direction of vehicle is controlled with gamepad
- The *base station* is the central point of the system. It processes and evaluates all the data. It transforms signals from control devices to commands for vehicle to move. It receives and processes the video data from cameras. Base station renders split-screen stereo image with distortion correction for each eye, what is required by Oculus Rift.

Usage:

- police departments and military sections might use remotely controlled vehicles to increase operators' safeness at bomb or mine disposal
- vehicles can be also involved in searching for people stuck in ruins or unreachable places
- Work in contaminated environment, working in deep ocean, space exploration
- driving this vehicle in virtual reality has great potential in entertainment industry
- scientists at Carnegie Mellon University work on a project with an attempt to land on the Moon using remotely controlled vehicle and the Oculus Rift
- Project results can be directly used for improving the educational process



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