First Person Viewing and Control of Remote Vehicles

This project will involve the design of a system to communicate the physics and visual data from a remote vehicle to a human controller, and respond to commands issued by the controller. The human will interact with the vehicle using a variety of input devices such as eye movement based commands, LeapMotion controllers, mouse(s) and trackballs, and other HIDs.

The challenges in this design are :

1. Sensing the dynamics of the remote vehicle: Sensors such as compasses, accelerometers and cameras will have to be integrated with microcontrollers such as the BeagleBone or Raspberry PI, and data will have to be communicated back to a controllers computer.
2. Data Modification: The input data will be modified based on prespecified transfer functions to replicate scenarios such as vehicle configurations, environmental conditions etc. So, it should be possible to add noise to the data collected (real time) to mimic an oppressive working environment.
3. Data Display and UI design: Single or Multiple displays will be used to present the data.

The final product will be a remote vehicle communicating and controlled by a human operator.

Team Requirements:

Good understanding of sensors such as accelerometers, heat sensors, compasses etc.

Excellent skills in programming, python preferably.

Knowledge of image processing.

Team Responsibilities:

 This project requires one computer engineering student and one to two electrical

engineering student. The electrical engineering student will be responsible for designing

communications systems, the sensing systems, image processing and transfer function coding. The

computer engineering student will be responsible for the system design including UI design,

user-inputs coordination including using an existing eye tracker to sense eye positions and display design.

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