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Project Ideation

Project Title: ROCKER BOGIE RESCUE AND SURVEILLANCE BOT SYSTEM

Project Description:

I propose a 'Rocker Bogie Rescue & Surveillance Bot System' as a capstone project which demonstrates a cross platform connectivity between the bot and a controlling station. The bot is constructed in order to access places that are not fully secured for humans, assisting in a form of live streaming for observation and surveillance before taking further measures in situations like natural disasters, mining accidents, urban disasters, hostage situations, explosions, terrorist attacks, etc. The benefits of it is to these operations include reduced personnel requirements, reduced fatigue, and access to otherwise unreachable areas. The controlling station provides access to the controlling mechanism of the bot and to the live video streaming from the bot's vision. Simultaneously, the prototype of the Rocker Bogie Rescue & Surveillance Bot's robotic arm has incorporated human hand motion interfacing through leap motion making it user friendly, accurate and effective.

Project Motivation: Please describe your motivation for undertaking this project.

There has been a phenomenal increase in natural and man-made disasters with the passage of time along with increase in technology to recover from those disasters efficiently and quickly. Usage of human forces as rescuers is at times dangerous and risky. Robots already available which serve this purpose are way too expensive for the third world countries to afford at a large scale. Here, I propose a rescue and surveillance system that can be used to perform tasks that can be done by humans and can save risking human lives, with an added feature of surveillance it can save the resources and extra effort from digging into places where it's not needed. Also it will be affordable amongst the companies of third world countries.

Expected deliverables: Please list all the expected tangible outcomes at the end of this project, e.g. a working prototype of the solution, a research paper to be presented at a conference etc.

Expected deliverables for the project includes a working hardware prototype.

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Skills needed: What skills do you believe are needed to successfully complete this project? E.g. hands on experience with FPGAs or Arduino, Experience with programming in C, Formulating new algorithms, PCB designing, Model creation and validation in MATLAB or any other appropriate tool, etc.

- Model creation
- Hands on experience with microcontrollers (Arduino & Raspberry Pi)
- Hands on experience with hardware and building tools
- PCB designing & Soldering
- Programming in Arduino C, Python, Java & MATLAB

Specific course requirements: Are there any courses (already offered or to be offered in future) in specific that you believe will help you in successfully completing this project? Limit your response to a maximum of three courses.

- ME 362 – Mechatronics
- Microcontrollers
- EDI

Proposed group members: Provide majors of group members in brackets

1. Choudhry Bilal Mazhar- cm00326 (EE)
2. Ovais Ahmed Yousufi- oy01678 (EE)

Proposed faculty adviser: Dr. Farha Lakhani

Comments by faculty adviser: N/A

Co-advisers (if any): N/A