**EECS 581 Group 2**

**Team Name:** STV Robotics

**Team Members and email addresses:**

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* Sri Gayatri Sundara Padmanabhan sri@ku.edu
* Paul McElroy pcm@ku.edu

**Contact:**

* Paul McElroy: phone # (785) 215-1633
* Luke Dercher: phone # (228) 313-5570
* John McCain: phone # (785) 218-5993

**Project Sponsor (if any):** n/a

**Project Description (150-250 words)**

· Why is the project being undertaken? Describe an opportunity or problem that the project is to address.

To enable people with basic programming skills to build and configure a telerobotics platform utilizing a web-based interface with the ability to connect and control. Applications of our platform include security cameras, medical robotics, industrial robotics, telepresence, and more. Our platform will allow robotics hobbyists to take their projects to the next level, businesses with limited budgets to build custom telerobotics solutions at a lower cost, loved ones to interact over long distances, and allow employees to work remotely easier.

· What will be the end result of the project?

The end product of our project (once joined with the COE team product) will be a telerobotics platform with minimal setup that anyone can use. Clients can connect from a remote device such as a laptop or mobile device to a central server through a web application. The server will then connect clients with the available registered robotic agents. Depending on the agents available and their capabilities, different configurations will be available for the users to select which will define the user interface for the robotic agents. Users will be able to configure basic UI for any connected robot that implements our system. We intend to complete the project with a few example robots & configurations.

The end product on EECS 581 side (independent of the COE side) will consist of a web based platform that exposes a robot facing API for communication and control, a client facing REST api for configuration and control, and a SPA style web application that uses the client facing REST API and allows for user control of the whole platform.

**Project Milestones**

*First Semester Goals*

* Design and initial documentation of robot-server messaging protocol (Oct 23rd)
* Proof-of-concept implementation of robot-server messaging protocol (Nov 6th)
* Design and proof-of-concept implementation of core server-side services (Dec 1st)
* Proof-of-concept level demonstration of core platform functionality from client REST API to robot communication (Dec 7th)

*Second Semester Goals*

* Full implementation and documentation of client side REST API (Jan 29th)
* Front end control application implementation (March 26th)
* Demonstration of robot-user connection from front end application to robot communication (April 9th)
* Demonstration of multiple simultaneous robot-user sessions (April 16th)
* Final documentation and release-ready product (May 1st)

*Note: documentation and test coverage will progress alongside development*

**Project Budget**

*Hardware, software, and/or computing resources*

* The CS team does not anticipate needing any specific hardware, but the COE team will need hardware to build the demo robots
* Access to server space enough to run a service oriented platform (meaning multiple independent applications, some of which may be resource demanding)
	+ General Purpose
	+ Storage for databases
	+ GPU resources
* We will use free and open source technologies, so there will be no software cost

*Estimated Cost*

* Access to ITTC GPU cluster and normal server cluster
	+ FREE :)

 *OR*

* AWS compute resources, estimated cost: $806.40 - $1520 (this is the possible range given the parameters below)
	+ ~500 hours of AWS ec2 server access, broken down as follows:
		- 3 to 5 t2.xlarge instances at a cost of $0.1856/hr
		- 1 or 2 i3.large instances at a cost of $0.156/hr
		- 1 to 2 p2.xlarge instances (GPU) at a cost of $0.90

**Work Plan**

-All team members are responsible for communicating when necessary with the COE team and helping them and requesting help as needed.

-Paul will be working on the design and implementation of Video services, frontend and backend implementation.

-Luke Dercher will be heavily involved in the design and building of the services supporting communication with the robot.

-Sri will work on building the server back-end, security issues, and will pitch in and help other teammates with other aspects of the project.

Github link

-John will work on system architecture, back end development, and design and development of the front end application

**Notes:**

We are storing our code in multiple repositories within a single Github organization. All repositories will be publicly viewable and open source. We will be using Trello and Slack for planning and communication between team members of both the EECS 581 team and the COE team. We will be using testing frameworks,