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| Autonomous Lifeguard Group |
| Team Charter |
| University of California, Santa Cruz |

## CONTACT INFORMATION

**TEAM E-MAIL**

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Communication Engineer

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**SHEHADEH H. DAJANI**

*Computer Engineer – Autonomous Systems*

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**DARREL R. DEO**

*Robotics Engineer*

Team Leader, Command Center and Sensors Engineer

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**DAVID GOODMAN**

*Computer Engineer – Autonomous Systems*

Software and Navigation Systems Engineer

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[PHONE NUMBER]

## OVERVIEW

**MISSION STATEMENT**

Our mission is to build an autonomous water surface vehicle (ASV) capable of traversing open water to a specified location, indicated by a remote tripod.

**PROJECT DESCRIPTION**

The purpose of this project is to develop a system that will provide assistance to a drowning victim while a lifeguard is deployed from shore. This system is composed of two parts, a command center and ASV. The command center, an encoded tripod with an on-board microcontroller, will obtain GPS waypoints of a drowning victim and wirelessly transmit the information to the ASV. It will accomplish this by triangulating the waypoint with the aid of yaw and pitch angles obtained via encoder wheels. The ASV, deployed in open water, will receive the transmitted GPS waypoints and navigate to the point of interest. Upon reaching the vicinity of the set destination, the ASV will employ active sensing to navigate to the drowning victim. As the victim grabs hold of the ASV, sirens will sound alerting the lifeguard of its location. Once the task is accomplished, the ASV will return to a docking point and await the next waypoint.

**DIVISON OF LABOR**

* *Darrel R. Deo:*

Will serve as the lead engineer for the **command center and sensors.**

As lead sensors engineer, he will oversee work involved with the design and implementation of the command center and sensors that will reside on both subsystems. He is responsible for developing a command center that will be easily used by a lifeguard operator and must ensure accuracy of a desired waypoint. He has also been assigned the role of team leader where his duties include, but are not limited to, managing all team members, upholding standards and policies, and ensuring all goals are met within a given timeframe.

* *John P. Ash:*

Will serve as the lead engineer for the **communication system.**

As lead communications engineer, he will be leading the Xbee communication between the ground station and boat. John will be working directly on the communication between the systems, working on minimizing dropped packets, and speeding up communication, while lowering power consumption of the Xbees. He will also lead the PCB layout of our micro controller boards. This includes creating and testing PCB layouts on copper, soldering parts to the board, and ordering the boards from the board house. He will also be in charge of keeping the Gant Chart up to date with our progress, and updating it as needed to make sure we are all on track.

* *Shehadeh H. Dajani:*

Will lead the physical design of the vessel as well as short range human detection. These tasks include determining an effective, stable, and safe boat hull design and working with the sensors lead (Darrel Deo) to integrate reliable short range human detection for the vessel. In addition, Shehadeh will be in charge of the budget. This will include keeping track of expenditures, cash flow, reimbursements, and parts inventory.

* *David A. Goodman:*

Will serve as the lead engineer for the **Software and Navigation Systems.**

As lead software engineer, David is responsible for delegating and overseeing software related tasks. This includes, but is not limited to, the design and implementation of interface documentation, unit test software, and software modules. Also, David is responsible for managing the project's documentation and source code repository. As the lead navigation systems engineer, David is in charge of design, implementation, and integration of the navigation systems on board the command center and the autonomous surface vessel. This includes ensuring that all sensors used for navigation are working properly and as intended, such as the GPS, altimeter, gyroscope, and accelerometers used in the rover and command center.

## CODE OF CONDUCT

**MEETINGS**

The team will be required to meet four out of five days of a calendar work week for collaborative work that will last for at least one hour. One of those four days will be dedicated to a status update meeting, where each member will report on the progress for the past week and goals for the following. Each meeting time will be agreed upon by all members at the preceding meeting. An agenda will be sent to all members and third party attendees no later than 24 hours prior to the meeting time. If a member is unavailable to attend during a set meeting time, they must alert the group no later than 24 hours prior. In the event that a professor, client, or sponsor will attend a group meeting, the members are required to arrive a minimum of 30 minutes before the scheduled time.

**TIME COMMITMENTS**

Each team member is required to work at least 30 hours per week, excluding prediscussed circumstances. Inability to meet the 30 hour minimum must be agreed upon during the weekly meetings and made up in the following week. Each member will be held accountable for their required task and must work to meet the goals set by the group during the previous week’s meeting. In the case that a task deadline is not met, the responsible team member will be required to notify the team one day prior to the deadline and must propose a new deadline. Team members that arrive late to meetings with no prior notice must provide justification for their tardiness. That member will be required to stay after the allotted meeting time to cover topics missed during the meeting.

**TEAM INTERACTION**

During team interaction, each team member must respect the ideas and arguments of their fellow teammates. Under no circumstance is any one member allowed to shoot down ideas of the other members. The team will be required to attend team building and social outings that are to be determined by the team. If at any point a majority of the team believes that a member must be sent home to get rest, that member in question must honor the decision.

**BUDGET ALLOCATION**

Funding sources will be seeked out through college grants, corporate sponsorship, and private donations. The difference between the total budget and the amount raised will be split evenly by the 4 member of the group. Parts will be purchased individually by the members of the group with approval from the budget lead (Shehadeh Dajani). On the last day of every month, all expenditures for that month will be totaled and divided by four. Each team member will receive or write a check covering the difference between their personal spending and the calculated amount. All totals will be rounded to the nearest dollar. Any money received from corporate or third party sponsorship (e.g. Colleges and faculty) will be divided evenly among the four members. Money received from private donations (e.g. family members, work) will remain with the intended recipient.

**TERMINATION POLICY**

Should a member of the team consistently cause delays, under perform, or violate any of the agreements made in the Charter,  the team member will be subject to the termination policy of the team. The team member will also be considered under probation. However before a probational member can be kicked off the team a set of steps must be followed:

1. The team member must be approached by the team lead and one other member of the group. A meeting must be had informing the team member that he is now under probation, and a plan for improvement must be laid out, allowing for the team member to remove their probational status.

2. If after ten(10) days the team member is still in violation of the policies set forth in the Team Charter then a third party will be asked to help mediate the situation, and a second meeting will be had with the team member.

3. If after five(5) days, still no improvement is seen, the remaining team members can take a vote on weather to kick the team member off or not. A unanimous conclusion must be reached.

4. If twenty-one(21) days have passed after the last action against a probational member. That team member will no longer be considered on probation.

**DOCUMENTATION AND REPOSITORY MANAGEMENT**

Any formal documentation or repository contributions must be committed through the version control system and approved by the Documentation and Repository Administrator.  All lab notebooks must be up to date and written in ink.  Upon every entry, members must sign and date page(s) worked upon. Each member is responsible for maintaining a lab binder for the documentation of data sheets and application notes as required for their assigned tasks. Each major entry must be indexed and dated for concise and timely referencing.

## AGREEMENT

By providing your signature below you are agreeing to abide by the policies set forth in this charter written for the Autonomous Lifeguard project, Jack Baskin School of Engineering Senior Design Winter/Spring 2013.

**JOHN ASH**   **DATE**

**SHEHADEH DAJANI**  **DATE**

**DARREL DEO**  **DATE**

**DAVID GOODMAN**  **DATE**