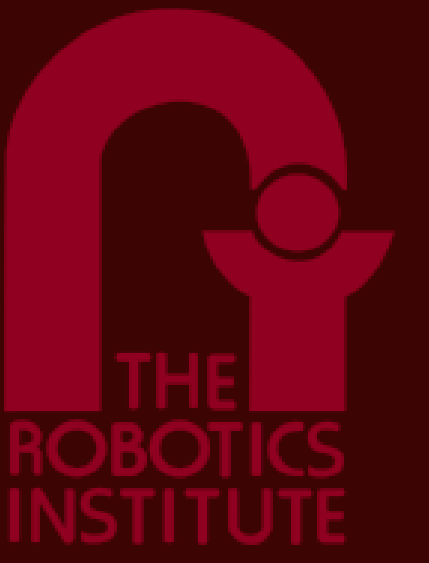


Cooperative Robotic Watercraft Project

Carnegie Mellon

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Abstract

The Cooperative Robotic Watercraft project aims at building the platform for watercrafts that are not only small and inexpensive but also autonomous to perform a number of applications such as flood mitigation and response, environment sampling, water oxygen monitoring etc. Making the watercrafts more autonomous in terms of their testing methods was the primary aim of my work in the Fields Robotics Centre. The wide number of applications of the watercrafts has also allowed the project to have a base in Qatar. A huge part of my work was also aimed at taking this project to Qatar to further look at more potential applications that the watercrafts can provide there. In this process, extensive field testing was performed with the watercrafts to find out the common technical and on-field errors.



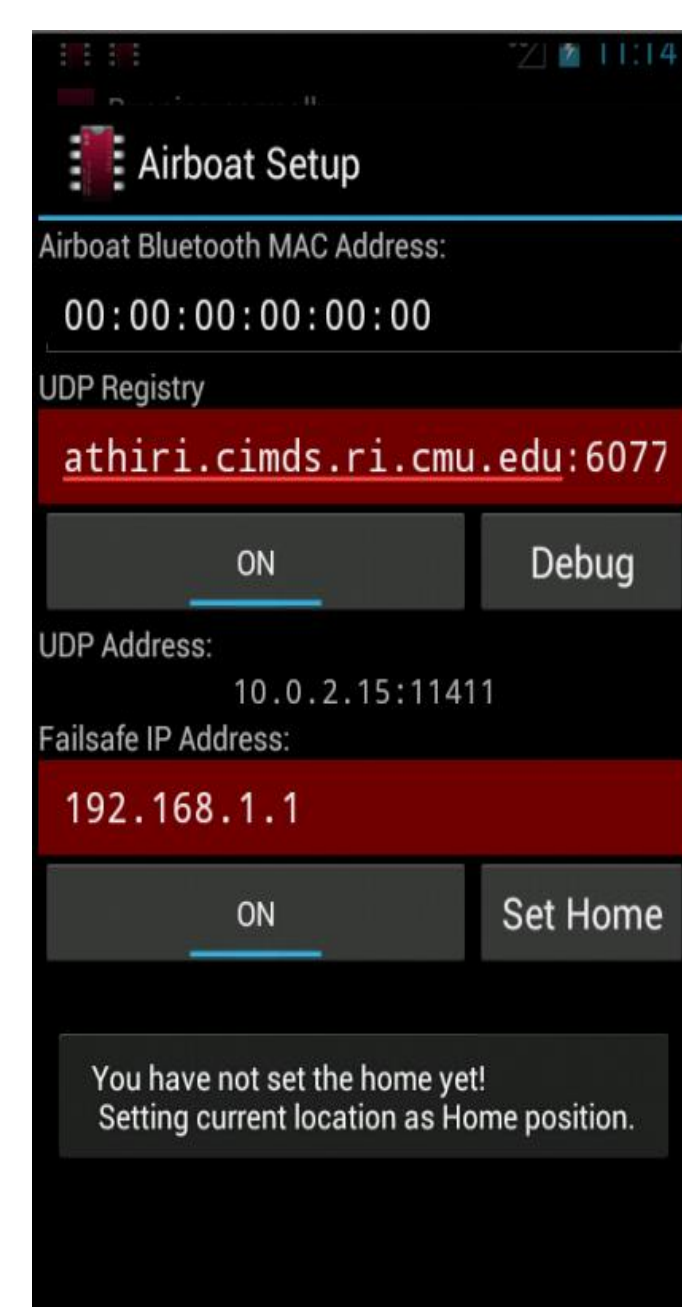
Above are the watercrafts that will be transported to Qatar for research on more applications that are specific for Qatar.

Goal

To make the watercraft autonomous, the primary goal was to improve the current platform that controls the watercraft. As the watercraft was controlled primarily by the commands of an Android phone, Existing Android applications (Failsafe) were to be improved and new Android applications (BaseStation Application) were to be created to provide more watercraft autonomy.

Failsafe Service

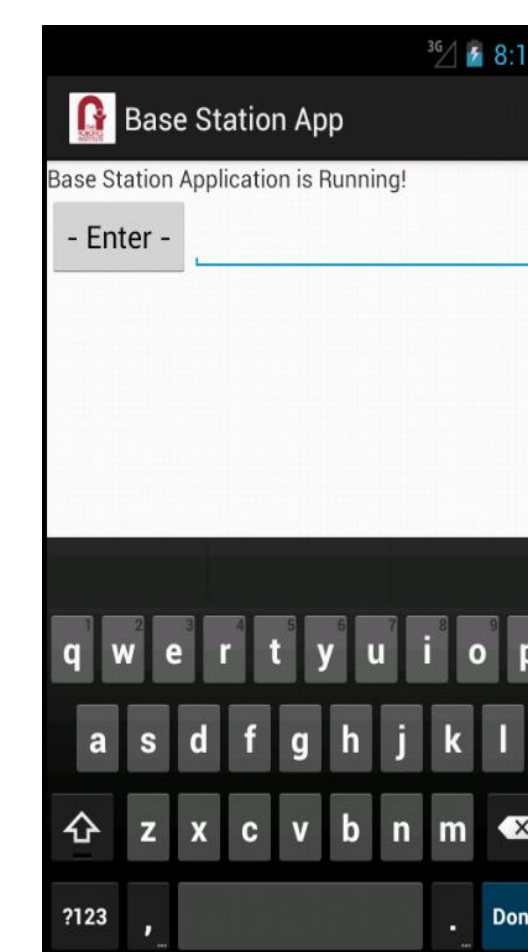
An existing service that could provide more autonomy to the existing watercrafts was Failsafe that was already implemented by Prasanna Velagapudi. Its main function was to enable the watercraft to the earlier set home location in case there was a network disturbance with the home station. Its UI was improved and the functionality was perfected with Prasanna Velagapudi.



Failsafe service running on the phone

Base-Station Application

This application resides on the watercraft and is initiated when the watercraft is placed on the base station. This application helps to make the watercraft more autonomous in its tasks. Once at the base station, it allows the watercraft to check the weather conditions and battery conditions, and decide if it is suitable time to go for any type of field testing. This application runs in parallel with the server of the watercraft. The visual design of the app shows the weather conditions of the city of the watercraft.



Outer design of the application

Conclusion

The project is progressing towards many improvements with the new hull design of the watercraft and set up of a new base station. The improvements of the server application that contains the Failsafe service and the creation of the new Base station Application only accentuate the boundaries of the what the watercraft can perform. These changes will be extremely instrumental for on-site field testing in Qatar. The next phase of the project will be to improve the controls of the watercraft from the base station application and to explore the different applications of the watercrafts in the Middle East region.

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References

Cooperative Robotic Watercraft Project Blog: <http://crw-cmu.blogspot.com/>