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2. Intern Hackathon Part 2: Your Drone Heard That!

Intern Hackathon Part 2: Your Drone Heard That!

Thursday 10/6/16 07:45am

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Posted By Mike Roberts

0 0

In our second HackMobile team feature, we are shining the spotlight on Team Dronarhythm, who have created a project with some serious moves!

Team Dronarhythm is made up of Hima Tammineedi, Homer Baker and Achintha Soordelu, and they describe their hack as an ‘always-on audio control system that allows a drone to respond to its environment in real-time, without needing specific user input.’

We sat down with the team to discuss their project, as well as their plans for projects in the future. For specific details on the [Dronarhythm project](#), be sure to read all about it on our projects page.



Tell us a little about yourselves and your team and how you got interested in the hack?

Hima: I'm a sophomore at Carnegie Mellon University (CMU) studying Computer Science. I love going to hackathons and making things, so I was always planning on going to HackMobile.

Homer: I decided to join the team because Hima and I had randomly run into each other at an intern event, and we found out that we went to the same school. We mentioned that neither of us had a team, so we decided to join up. And then Hima found Achintha, and our team was complete. I'm a junior at Carnegie Mellon studying electrical and computer engineering. I was interested in participating in the hackathon because I had a friend who participated the year before and told me about how much fun it was.

Achintha: I am a junior at Purdue University studying Electrical Engineering. I had never participated in a hackathon so I thought HackMobile would be a perfect opportunity to get my feet wet.

When you got your hands on the DragonBoard 410c, what was the first idea that came to mind? What sort of project did you want to work on?

The DragonBoard 410c is a very versatile device, and we recognized that we could take advantage of those features for a wide array of projects. We had lots of ideas floating around, from smart toasters to musical boxes and more! Eventually, we decided on creating a project related to robotics, and we knew that we could also use a drone so we decided to put the two together to see what would come out. Thus, DronaRhythm was born!

What inspired you to create this project? Did you achieve the outcome you wanted?

Hima: Homer hadn't worked with drones before and had only just taken a signal processing course, so he figured this project would be a good application of what he learned.

Homer: Hima felt that having a drone that could respond to audio would be fun, and could open new doors for drones in the future.

Achintha: We wanted to have drones perform actions in response to external audio cues. In the future, drones will be everywhere! If they were able to 'hear', they could respond to their environment in order to perform

tasks more efficiently, as well as execute actions that could help in other ways. For example, if a drone was delivering a package and heard sounds of distress, it could quickly go to the location and assist emergency services with recordings or geolocation services.

How much did you prepare in advance of the hack for working with the DragonBoard 410c? Have you done any additional work on your project since after the hack?

Achintha: I read about several different digital signal processing methods and programmatically implementing them. For the DragonBoard 410c, this meant thinking about using libraries and algorithms that would be lightweight enough to run with low-power on the DragonBoard 410c, but effective enough to generate distinct directions.

What surprised you the most about the functionality of the DragonBoard 410c?

We were most surprised by how much computing power the board had for such a small form factor. We ran some computationally difficult algorithms involving digital signal processing, and the DragonBoard 410c was capable of processing in real-time. We were also impressed by the fact that it could run both Linux and Android, an uncommon feature in comparable boards. Although we didn't use the Android OS on the board for our project, it gave us an extra option to consider when we started.

Do you think of yourself as a developer or maker? Maybe both?

Hima: I usually say I'm a developer, but in actuality, I'm definitely a mix of both developer and maker. While I love being a developer and finding great solutions for problems, I know that I also get very excited about making cool projects (especially related to IoT!) and showing them to people. I also love helping others with their projects and getting them to tinker and try new things.

What other Qualcomm hardware/tools are you using with your project?

Our project revolved around using the Qualcomm Snapdragon Flight drone platform. We used the DragonBoard 410c in order to process the audio in order to send commands to control the drone.

You mentioned you were using Linux, which versions?

Debian on the DragonBoard 410c, and Linaro on the drone.

In thinking about your next project with the DragonBoard 410c, what functionality do you plan to use?

Hima: I'm really excited to use all of the sensors and connectivity options (Bluetooth, Wi-Fi, GPS) because they make the board a really good computer in your pocket. But also with the capabilities of a mobile device.

Achintha: I've been thinking about using the GPIOs to control external motors as part of a dorm automation project.

Homer: I was looking into the breakout board options so I could use the DragonBoard 410c for a robotics obstacle course competition at school this year. We are looking at running some basic computer vision algorithms, and letting the breakout boards handle some of the more simple operations.

What advice would you give to someone who has never used the DragonBoard 410c before? What would you recommend for that person to get started on their own projects?

Hima: If you are familiar with Linux, then you will be familiar with this board. And while we did not play around with Android on the DragonBoard 410c, from what we experienced it should be pretty quick to pick up. If you've used a Raspberry Pi before, then you can use the DragonBoard 410c.

A couple of things make it unique, particularly the ability to interface with wireless devices as well as the sensors it provides. If you're going to use it, really try to take advantage of these features.

What does the phrase 'Internet of Things' mean to you? How does it apply to your projects with the DragonBoard 410c?

The Internet of Things is the network of devices and information that flows around us. Our homes, workplaces, and cities have started to become "smarter," and soon enough they will be truly smart and connected. When this happens, the Internet of Things will become the network that it is envisioned to be, and we will have made a big step towards the future that you see in science fiction.

Our entire project revolves around the Internet of Things because in the near future drones will be more and more a part of society and the public space. If we can give those drones the power to process audio in real time, they will be able to perform many new and innovative functions.

Be sure to pay a visit to Qualcomm Developer Network for more information on the [DragonBoard 410c](#).

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Mike Roberts, senior director of global product marketing for Qualcomm Technologies, Inc., oversees Qualcomm's developer program, where he leads numerous efforts for Qualcomm's developer community, including gaming, embedded computing and Internet of Things (IoT).

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