Developer Network

Search Site

Search

Search

Log InRegister

Site Navigation

- Get StartedExpand
  - Android Development
  - Embedded Computing
  - Gaming & Graphics
  - Internet of Things
  - Why Snapdragon Processors?
- SoftwareExpand
  - CompilersExpand
    - Snapdragon LLVM Compiler
  - Specialized SolutionsExpand
    - Adreno GPU SDK
    - AllJoyn Proximal Connectivity Platform
    - AllPlay Click Wireless Home Audio SDK
    - FastCV Computer Vision SDK
    - Hexagon DSP SDK
    - LTE Broadcast SDK
    - Snapdragon Math Libraries
    - Snapdragon SDK for Android
    - Snapdragon VR SDK
    - Symphony System Manager SDK
  - DebuggersExpand
    - Snapdragon Debugger for Eclipse
    - Snapdragon Debugger for Visual Studio
  - ProfilersExpand
    - Adreno GPU Profiler
    - App Tune-up Kit
    - Snapdragon Profiler
    - Trepn Power Profiler
- HardwareExpand
  - Android Device Dev KitsExpand
    - MDP 820
  - Cellular Connectivity for IoTExpand
    - IoT Development Platform
  - Wi-Fi Connectivity for IoTExpand
    - QCA4002/4
    - QCA4010/12
  - Snapdragon for EmbeddedExpand
    - Which Processor is Right for You?
    - Snapdragon 410E Processor
    - Snapdragon 600E Processor
    - Additional Snapdragon Boards

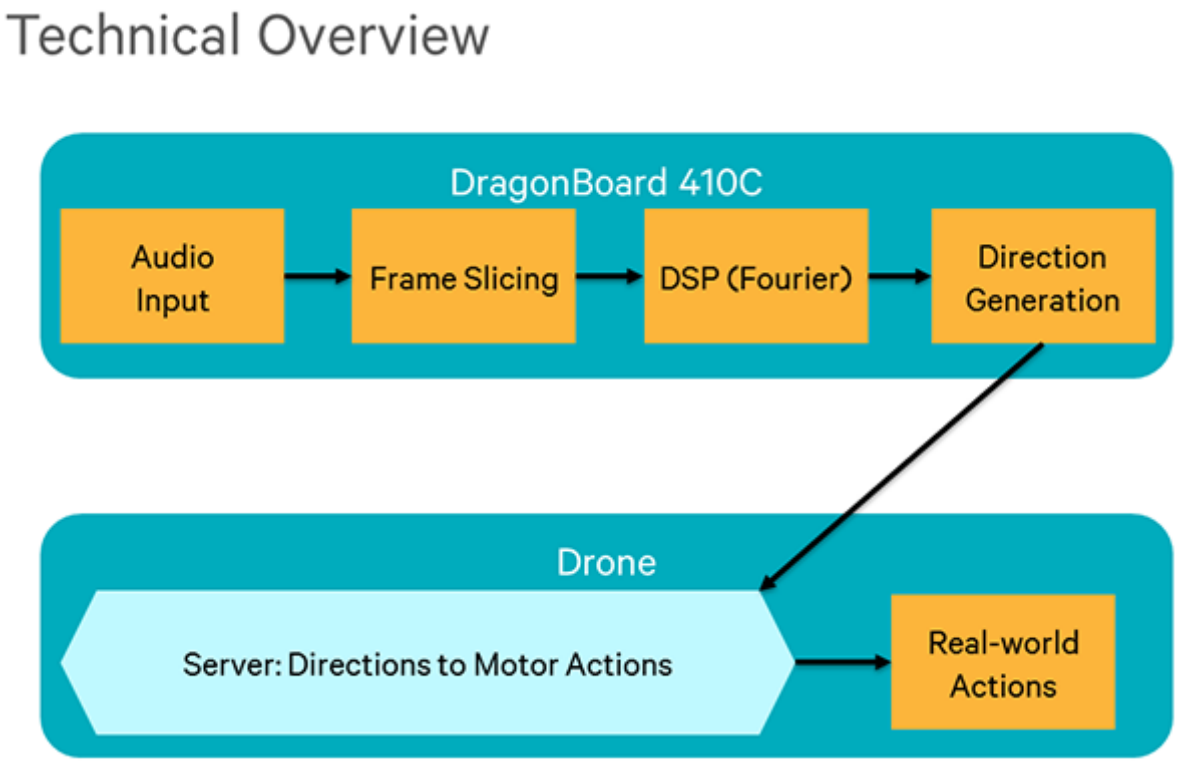
DronaRhythm

Skill Level	Area of Focus	Operating System
Intermediate	IoT Smart Home/Smart City Robotics	Linux

DronaRhythm is an audio control system designed to allow drones to be virtually always-on, and respond to their environment in real-time without needing specific user input.

There were a variety of inspirations for this project, but it boiled down to combining robotics, audio (or music), and drones. From there the project evolved to creating a drone that could respond to audio, which would be a fun application of drone technology that could open up new drone use-cases in the future.

The desired result is to have drones that can perform certain actions in response to audio cues from their environment. In the future, there will be many drones flying around performing various tasks. If they also have the power of hearing, they could respond much better to their environment in order to perform better, or perform additional tasks. An example of this could be a drone performing a simple function such as delivering a package, but then it could also help in other ways. While the drone is delivering a package, if it can hear glass breaking or people screaming nearby, it could go over to where the sounds are coming from and start recording the situation in order to alert the police.



Materials Required / Parts List / Tools

- DragonBoard 410c
- Snapdragon Flight
- Keyboard
- Mouse
- SD Card

Build/Assembly Instructions

- **DragonBoard™ 410c**
  - Using an SD card with a boot image of Debian, flash Linux onto the DragonBoard 410c
  - Update Debian through the standard “sudo-apt get” commands
  - Install the required Python libraries - matplotlib
    - This is easiest through pip-install, so make sure that pip-install is correctly set up
  - It may be useful to install Audacity to play through audio files for testing purposes
    - Most easily installed by using “sudo-apt get” commands as well
  - Download a .wav file of your choice to perform wave slicing on, preferably of at least a few seconds
  - Load the source code for DronaRhythm’s wave slicing algorithm and in the code, substitute the name of the .wav file that you downloaded
  - This code should be able to execute and display output commands based on your .wav file

    - At this point, follow the steps required to set up the drone's server and make sure that you match the port number between the drone's server program and the wave slicing program
- **Drone**
    - This project was tested with SNAV sprint release 100, so load a sprint that isn't too different from that version to guarantee compatibility
    - Load the server code and start the server

Usage Instructions

- Start the server on the drone
- Start the wave slicing program on the DragonBoard 410c, making sure that the correct port number and .wav file are specified
- The wave slicing program will then automatically send commands to the drone based on what it processes

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About the Developer

Achinthya Soordelu, Homer Baker, Hima Tammineedi
Former Interim Engineering Interns
Qualcomm Technologies, Inc.

Other Projects

- Dragonboard 410c
    - 3D Printed Case
    - Amazon Web Services (AWS) IoT
    - Auto Luminosity
    - Breakerball
    - DLNA Media Server / Client Solutions
    - Dragon Detector
    - DronaRhythm
    - Electrical Current Tracking
    - Fit Turtle Posture Robot
    - GPIO Programming (96Boards)
    - GPIO STEM Workshop
    - Home Automation
    - I2C Accelerometer
    - IBM Watson IoT Platform Service
    - IBM Watson IoT Platform: Sensor Reading
    - Magic Check-in Clock
    - Model Railway Control
    - Report IP Address During Headless Boot
    - ROV with Windows 10 IoT Core
    - Seeing Eye Robot
    - Sensor Demo

- Smart Cap
- SPI Accelerometer Sample
- TurtleBot 2e
- Windows IoT – Connecting to Network

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  - Android Development
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  - Gaming & Graphics
  - Internet of Things
  - Why Snapdragon Processors?
- Software
  - Compilers
  - Specialized Solutions
  - Debuggers
  - Profilers
- Hardware
  - Android Device Dev Kits
  - Cellular Connectivity for IoT
  - Wi-Fi Connectivity for IoT
  - Snapdragon for Embedded
  - Robotics
  - Bluetooth Connectivity for IoT
  - Additional Solutions
- Downloads
  - Software Development
  - Hardware Development
- Forums
  - Software Development
  - Hardware Development

- Community
  - Projects
  - Case Studies
  - Blogs
  - Get Noticed
  - Stay Informed
  - Follow Us
- About Us
  - About Us
  - Events
  - Stay Informed
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