µBot Proposal

Overview

µBot will be a bipedal robot that plays and dances to the beat of any songs. It will be **voice activated** to receive commands. Songs should be queried and pulled from an **external api** (Spotify or Soundcloud, Youtube? are tentative candidates)

Prototype & Development

- We will be using an experimental prototype
    - A lot of our project involves tweaking the motion of our robot which is best done through making improvements based on tests
- We will build a basic physical frame and gradually build up its functionally
- A possible path for the prototype could be:
    - We will design the robot and make sure it can move fluidly
    - We will then test certain dance moves
    - Afterwards we'll add beat analysis, and voice detection through external APIs

Software

The bot will require a software component to handle voice commands. Currently the plan is to send requests to third party natural language processing (NLP) and voice recognition services. Additionally:

- We will program the robot to perform different moves using servo movement
- We will analyze the song to find out specifications like tempo and peaks
- We will make requests to Spotify, Youtube or Soundcloud APIs to stream music
- We will process voice commands through facebook's wit.ai NLP platform

Hardware Requirements

- Arduino
- Speakers to output music
- LEDs to visualize music
- Servos for limb movement
- Microphone/audio input device for voice commands
- Wifi adapter? For network connectivity

Challenges

- Ensuring that the robot moves fluidly and doesn't tip over while moving
- Error handling for blocking/synchronous API requests and network error handling
- Train/optimize NLP model to accurately handle voice commands and song names