Interactive Rhythmic Robots

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We propose an interactive art installation that showcases some ongoing work in our lab, the Interaction Lab within the RITMO Centre at University of Oslo. The installation will comprise three components, as depicted in Figure 1.
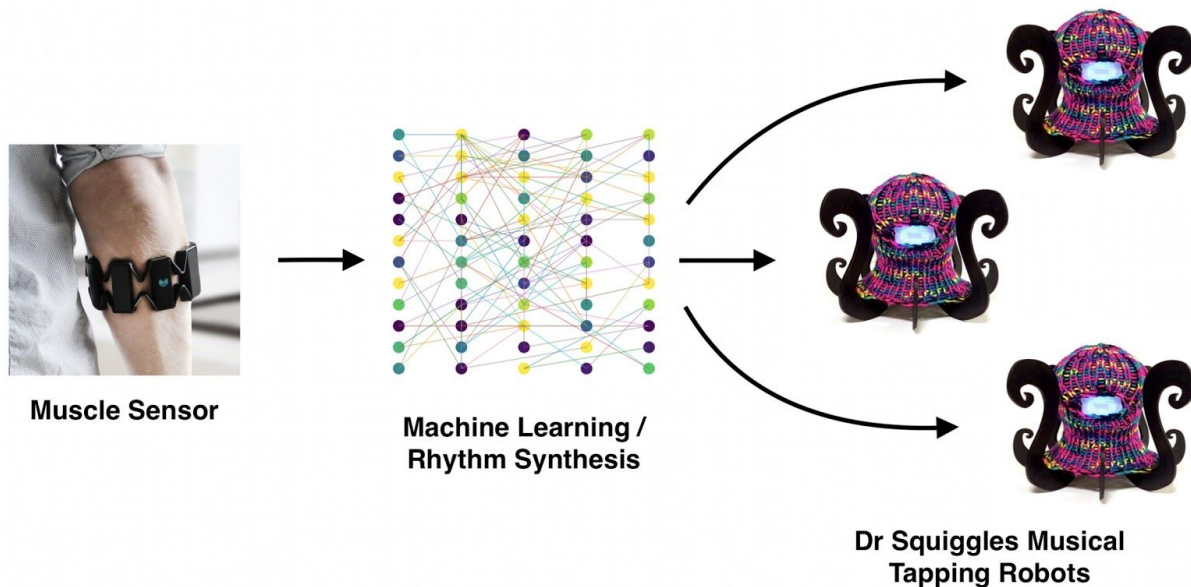

Figure 1: *The three components of the proposed installation.*

These are as follows.

1) **A few (three to five) Dr. Squiggles robots:** Dr. Squiggles is a musical tapping robot. It listens for music in the environment, and improvises accompaniment rhythms, which it plays by tapping on the table with solenoids. When visitors enter the installation space they will see and hear the robots playing rhythms with one-another. Here is a very short demo video: https://www.youtube.com/watch?v=ZV-KKUOIsKg, and here is a more in-depth explanation https://www.youtube.com/watch?v=mw4HaYrX07s of the project.

2) **Adaptive rhythm-generating algorithms:** We will use adaptive rhythm synthesis algorithms to generate continually evolving music that the robots will play. The algorithms will evolve specifically with the objective of maximizing user engagement.

3) **Myo Muscle sensors:** Visitors who choose to do so will have the opportunity to wear a muscle-sensor arm-band. Using this, they will be able to use their movement to influence the music generated by the robots. We will use the muscle data to measure user engagement to tune the rhythm-generating algorithms. We will additionally use the data future study that explores the link between rhythm, entrainment, and engagement. A previous work of one of the authors that uses a muscle sensor to control a robotic system is here: https://vimeo.com/201716216.

Tech Requirements

Space: A separate small room would be ideal, or the corner of a larger room or vestibule would work. The installation might be somewhat loud and we don't want to interfere too much with other activities.

Power: We will need at least 8 power points; each robot needs wall power, and we will have a couple of laptops and battery chargers that will need power.

Plinths: Ideally, each robot (three to five of them, TBD) would be on its own plinth. If that is not possible, each robot could be on its own small table, or as a last resort they could be all together on a single medium-sized table. We additionally request a secondary small table off to the side where we can set up a laptop and battery chargers.

Duration: We prefer the installation to run for as long as possible, preferably for all three days of the conference.