School of Music, Theater & Dance
Dr. Andrea Brown, Assoc. Dir. of Bands

MAESTRO: Conductor's Baton Simulation

Description of Project

Conducting a choir, symphony, band, ensemble or soloist is a skill acquired over time. Teaching Music students this skill requires several resources – an instructor to watch carefully and provide feedback, a minimum of one instrumentalist to be conducted, and a sound-proof place to meet.

The use of technology in music conductor training is a growing area of interest. The expressive, subtle and meaning-rich gestures that are used in conducting, serve as a fruitful ground for innovative research in areas such artificial vision, gesture following and musical mapping. Previous virtual conducting projects, such as the installation at the Vienna's Haus der Musik, have focused on the activity of controlling only speed (tempo) with little support for subtle and sophisticated control of musical elements such as duration, articulation, and dynamics. These projects, therefore, could not fully support conductor training at the pedagogical level.

The goal of this project is to develop a virtual conducting system that would allow for the refinement of kinesthetic skills that are essential to creating subtle gestures improving conductor performance and confidence on the podium. This project will support the learning of kinesthetic conducting skills while furthering development of essential musical and cognitive skills.

Maestro, in its 2016 MDP iteration, was designed in conjunction with the development of a supportive curriculum intended for use in an undergraduate introductory conducting course. This system implements gesture-tracking algorithms based input from a KINECT to provide musical feedback to the beginning conductor.

The goals of Maestro for the 2017 MDP are to build upon the successes of the 2016 program by refining the accuracy and acoustic feedback of the current system and extending the range of musical gestures. Specifically, the goals include

• A gesture anticipation algorithm for more complex conducting patterns and musical expressions

• User testing of the 2016 system to improve usability and accuracy

• Exploration of other sensing systems for capturing more nuanced conducting gestures

- Extended sound palettes for conveying musical expressiveness

Maestro is being used in courses taught in the University of Michigan School of Music, Theater and Dance beginning Fall 2016.

Location
All project work will take place on campus, with periodic presentations to School of Music, Theater and Dance faculty.

Project Sponsor Mentor
ANDREA's BIO

Project Faculty Mentor
GREG's BIO

Key Skills & Project Roles

ROLE ON TEAM	Description of Skills & Likely Majors
Signals, Controls, & Sensing	Electrical Engineering Computer Engineering Computer Science
Biomechanics of Conducting/Musical Performance	Mechanical Engineering Biomedical Engineering Kinesiology
Programming	Computer Science
Usability studies/UI design	School of Information Computer Science Performing Arts Technology Conducting

Legal Requirements

Citizenship and Right to Work Options

This project is open to all students regardless of citizenship status

Internship Information

On-Campus Summer Research Stipends for Summer 2017 may be available based on application in February 2017.