

Project: The Pointe

Laura Hirsh

<https://github.com/lhirsh/CART360/tree/master/FINALASSIGNMENT>

Dance, an art form that incorporates body, movement, music and expression of emotion. The potential for sensor integration in an art form so conducive to movement, music and interpretation of meaning dependent on action and sound, seems to be a fantastic starting point for sensor research and application. Ballet dance, a classical dance that utilizes the notorious pointe shoe, is a dance not only popularized worldwide but influential in Montreal's own arts scene. Les Grands Ballets Canadiens celebrates over 60 years of gracing Montreal with professional ballet dancers and ballet productions.

The intended audience is broad however the expression itself specifically goes to that of the dancers. The performance although shared begins with the movement of a single performer, in this scenario; that being the ballet dancer. I want to present my object to a performer and allow them to manipulate the emotion, motion and sound of a piece while simultaneously allowing them to include others in this distraction from the structure of traditional ballet. I want to give ballet dancers more agency over the sounds which they hear and the ways in which they might express themselves through their movements.

I want to create a pointe shoe that uses sensor technology to manipulate classical music familiar to ballet dancers, making for another aspect of delivery in a considerably

structured dance form. I want ballet dancers to question the structure of classical ballet and experiment with the arrangement not only of the music, but of how they might have the music express the feeling of the movement. Ballet dance is incredibly technical, emphasizing the importance of what is deemed proper execution and form, my experiment will entail enticing dancers to break from the structure to generate a unique experience, sound, and emotion. The choice to do so will impact the way others may dance or how the audience might read the performance.

The disruption caused by the shoe allows there to be another way in which ballet dancers have potential to break from classicality, to experiment and receive distinct responses not only from the shoe but from the audience as well as their fellow dancers. I envision a performance with more than one dancer that incorporates the shoe for the full effect, however a solo performance will also showcase the ability of the shoe. When wearing the shoe dancers are given a choice, to allow the shoe to affect the way they dance, or to try and maintain the expected composure and guidelines set by traditional ballet rules and classical music. If they chose to dance differently, that may affect the way others dance, if they choose to ignore the shoe other may still choose to dance differently on account of the rearranged music.

I believe the challenge lies in what dancer will do to respond to this shoe as every dancer will respond in a different manner, the response is reflective of the dancer themselves and the reaction of others including the audience and fellow dancers can be

independent of the shoe wearers decisions. I cannot say whether the shoe will help or hinder the performer or performance, that is in the feet of the dancer and the eyes of the audience and fellow dancers. With an infinite number of responses and outcomes from the music produced by the shoe, to the decisions of the dancer, to the reaction of the audience and others, the shoe serves as a unique tool in which one can experiment with control and manipulation of not only sound but of others and of the response.

The message is the performance of the dancer and the reaction of those around them, it acts as commentary on the dancer themselves as well as the attitude of others towards this manipulation. I want the meaning to be the interpretation, the contrast between structure and experimentation, and the application of agency. The classical structure of ballet can be tampered with simply by reactionary music and the confines of the dance itself broken with spontaneity. The variations from dancer to dancer and the reaction of one onlooker to the next will always encompass a unique experience and render an individual response. Despite strict choreography, the ballerina can choose to instead work with the shoes rather than instruction.

My plan is to work with accelerometers, force sensitive resistors and pressure sensitive conductive textiles within Arduino and likely processing or Max. I would like to have the shoes working wirelessly so as to avoid masses of wires however I will work to see what prototyping leads me to. I will have a dancer present the shoes for me and I want the music manipulation of the shoes to be dependent on the actions of the dancer.

For example, reverse when the leg is thrown back, or speed up as the leg is thrown forward. I want there to be poetry between the correlation of the action and the reactionary music, this is where creative expression will lie.

In a 2010 shoe promotional ad for NIKE Rhizomatiks Design brought to life a shoe that doubles as an instrument. The shoe prototype was developed by Tomoaki Yanagisawa with Daito Manabe handling software development and sound design. The musical shoe itself was performed by the breakbeat unit HIFANA. Each shoe was programmed with a distinct sound using a combination of Max and Ableton. Curvature sensors and acceleration sensors were built into the soles and allowed the performer to twist and bend the shoe, playing it like a sampler. The curvature sensor used was a thin, cylindrical film that transmitted constant resistance measurements to a computer through a jack, and this signal was in turn processed into sound in the computer's software.

This project did not incorporate the body as much as it did the shoe, in the performance the performers do not wear the shoes but rather play them on a table hooked to a mixer and use them as musical objects to promote Nike. The sensors used are some that I am going to investigate and likely incorporate myself however I will be using different software and adding arduino. After investigating their shoes I realized it would be nice to have the shoes operate wirelessly so as to remove cords, but I will do further research in the area and start with prototyping.

Another similar project would be push_reset's Musical Shoes. This project is open sourced and available as an instructable if needed. These shoes are made with three soft switches of conductive fabric on the bottom of each shoe that connect to an Adafruit Feather Bluefruit 32u4 board. The board is programmed to be recognized as a bluetooth keyboard so whenever a switch is closed it's read as a keystroke. These keystrokes are mapped to sound files using a piece of software called Soundplant. The shoes wirelessly connect through bluetooth and each time you tap a toe or click a heel a sound file will play from the computer. You can also connect a bluetooth speaker to the computer to get louder and better sound.

These shoes are more about making music from small samples as you trigger specific sensors and less about manipulating a composition with the intentions of how the dancing should be carried out. This example utilizes bluetooth which would be beneficial to my project, however the shoes themselves fail to illustrate the same content and commentary as the shoes I hope to create. The documentation of the work showcases the dancing aspect of the shoes but the dancing itself is forced due to the nature of the shoes, dancing that triggers the sensors to make sounds must be happening in order for there to be any action. The music does not continue if the dancing has stopped and the music itself has little to do with the form of dance and expression of the character.

The last piece I looked into was Navid Navab, Jerome Delapierre and Michael Montanaro's piece Practices of Everyday Life | Cooking performed by Tony Chong. This work involves worldly practice of centuries such as cooking, into an immersive visual and electroacoustic sensory experience. Practices of Everyday Life is a concert that focuses on poetic gesture-sound correlations and sonic response to gesture. It is a compositional exploration of an interplay between the senses, materiality, and the aesthetics of everyday practices. The performance features a lively chef who wields foods, knives, pans and spices gesturally into real time sound instruments. Gestural sound compositions and responsive imagery unfold in real time as the chef playfully prepares a meal with computationally enriched ingredients.

The utensils, tabletop and even ingredients include amounts of sensors that trigger upon use. The sound produced is the result of manipulating pre existing compositions and all objects used by the chef alter the sound and the visual response to some degree. The sonic response was meant to be reflective of the object or the way in which the object is used, a nicely considered aspect of the piece. How the shoes are being used and the actions the dancer will carry out will certainly be reflective of the sounds which will be produced, the Practices of Everyday Life show is a stellar presentation of that.

This project will have an edge over similar works because this work incorporates a dance form that prioritizes uniformity and constraint, the sensor work will disrupt

traditional classical music thus leaving potential for experimentation of form or feeling and an open window of interpretation for others. The programming itself won't necessarily be about making music either, rather manipulating what's preexisting. The structure in fluidity and grace of classical ballet is what leads it to stand apart from other contemporary forms of dance, the importance of the shoe in this particular dance form differs from that of projects previously researched and I am incredibly excited and curious to see what comes of this proposal.

