

## “Lines of Reflection” – the Actor’s Automated Scene Partner

For my final capstone project, I have decided to build a smart mirror specifically for actors who are learning lines for a play. In my free time, I participate in the local community theatre, and one of the challenges faced by actors is memorizing lines on their own. It is far easier to learn lines (especially to get the exact wording of each line) with a scene partner – someone who can follow along in the script and read all other characters’ lines and prompt the actor if necessary when it is his or her turn to speak again. But this is a very time-consuming, repetitive, rather boring job, and it is not always possible to find another person to take on the task. It would be extremely beneficial for actors if they had a device that could serve this purpose. It would be even better if it was something that could allow them to both see their facial expressions and gestures (for instance, by looking in a mirror) and would also follow along with spoken lines (including prompting when necessary). This could allow the actor the benefit of experiencing the exact words from the script, without trying to follow the script themselves and also without accidentally seeing their own lines.

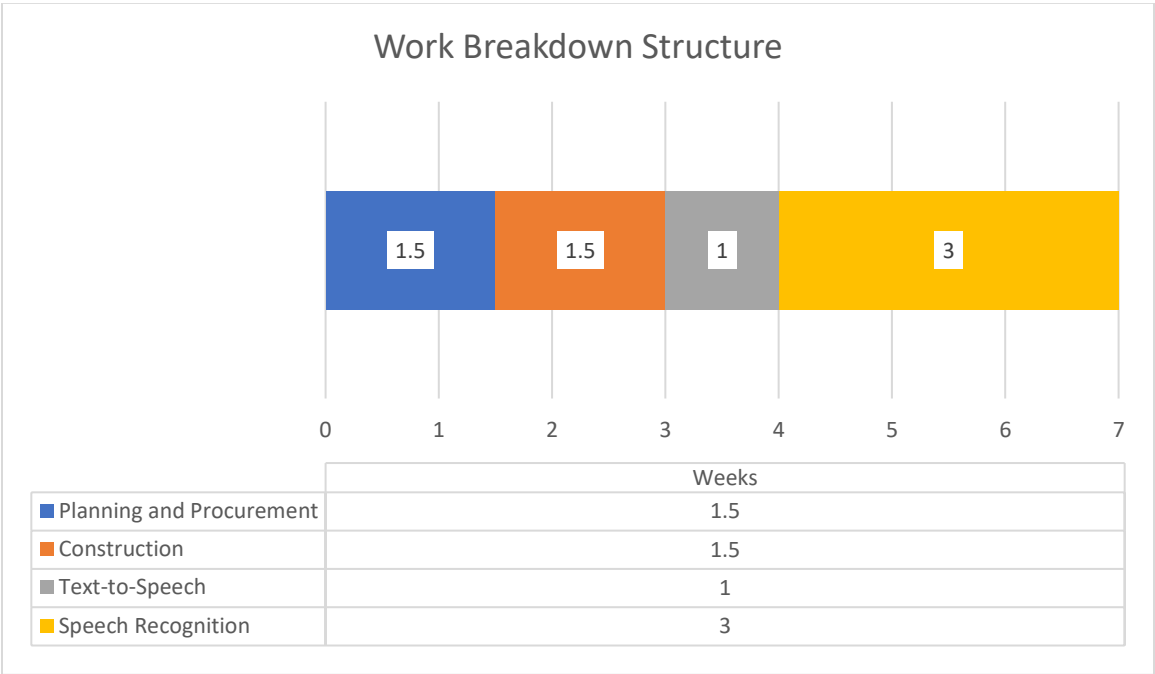
Smart mirrors (or “magic mirrors”) are relatively commonplace on the internet, but the key difference that makes this an innovative project is that I want to enhance the mirror with cloud-based voice recognition and a text-to-speech feature, so that it does not merely display information, but also can understand and respond to vocal input. When actors are trying to memorize a part, they can speak their lines in front of the mirror. The mirror would be able to follow along, display the actual line if the actor isn’t accurate, and then speak the next lines from other characters to cue the actor for his or her next line. I have only this course’s previous experience in building internet-based devices and no experience in cloud computing, so I expect this will be quite a challenge.

Not only does this gadget actually solve a real-world problem, it also leads very naturally to future enhancements. Another useful task would be leading an actor through vocal warmups, tongue twisters, and stretching exercises. It could give feedback on pacing or timing. This could be a tool for singers to warm-up on scales and arpeggios, or perhaps could be programmed with background music for singers to practice their songs. These ideas are not in my plan for this semester, but I’m excited to work on them in the future.

There are four main stages to this project. First is planning and procurement, where I will decide the specifics of what I’m building and order the necessary parts. I do not know how expensive this project might be to take on, so I may need to be creative with some of my acquisitions. Second is construction, where I will build the actual physical framework and configure the Raspberry Pi with generic smart mirror software. By this point, I would have a working “magic mirror,” which even in this simple state, would be incredibly cool to hang in my own home, but which would not be especially innovative. Third,

I will enable text-to-speech (perhaps using AWS Polly or Google translate) so that the mirror can translate written text to audio through an attached speaker. Finally, I will enable cloud-based speech recognition (perhaps using AWS Transcribe) and code the mirror to follow along with the actor.

Since there are seven (7) weeks between March 19<sup>th</sup> (today) and May 9<sup>th</sup> (the strict deadline for this project), you can see my estimate for the breakdown of these four stages in the chart below:



I will be completing this project on my own, as a team of one. So no other netids are necessary.