

Project Milestone 1

15-300, Fall 2020

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Project Title: Machine-Aided Keyword Suggestions for Aphasic Speech

Webpage: <https://amy1351.github.io/15-400.html>

1 Major Changes

In the initial project proposal, we had planned to build a deep learning learning model to perform keyword prediction for aphasic speech. However, after exploring the project a bit more, we realized that performing keyword prediction is a very technically challenging task and is difficult to evaluate. Since then, we have redefined the scope of the project by dividing it into two separate phases. In the first phase, we will process the data from AphasiaBank and create a model to perform sentence completion on aphasic speech. This is an easier task, and will be what I plan to accomplish next Spring. In the second phase of the project, which will likely continue throughout 2021, we will tackle the more difficult challenge of predicting the next keywords in aphasic speech.

Additionally, due to a change in my personal plans, I will be taking next semester off from CMU and unfortunately will not be able to take 15-400. However, I have talked with my project advisors and still intend to continue with my research project during the Spring!

2 What I Have Accomplished So Far

Thus far, I have redefined the scope of the project to make it more realistic for next semester. I have done more background reading on different model architectures that can perform word prediction in neurotypical speech, and practiced building and training a small speech-to-text deep learning model to improve at using PyTorch. Lastly, I have performed processing on the

AphasiaBank data to convert it from the CHAT (Codes for the Human Analysis of Transcripts) format to a simpler text format that can be used as input to a model.

3 Meeting My Milestone

I have completed the tasks for my first project milestone. These included reading the papers listed in my project proposal, brainstorming possible language models and evaluation criteria to use, and pre-processing the aphasic speech data from AphasiaBank.

4 Surprises

I have not had any major surprises so far. However, one thing I realized was how little existing technology there is to help people with aphasia, even though it is a common communication disorder. The only existing technology for communication assistance that I could find is a speech-generating device which uses hard-coded rules to prompt the user towards the correct word. I am interested to see whether we could employ machine learning methods in these assistive devices based on the results of our research.

5 Revisions to 15-400 Milestones

My milestones from my project proposal have not changed. However, instead of creating a model for the task of keyword prediction, I will be creating a model for sentence completion. After this is successfully done, I will then move on to the second task of predicting keywords for aphasic speech later in the year.

6 Resources Needed

Yes, I have all the resources I need for my project.