

Virtualization of a Turing Machine Weekly Report: 3-14-2021

Outlined in this document details the work and progress toward the making of the Virtualization of a Turing Machine Project for the week of 3-14-2021.

Throughout the week, the combined efforts of the group worked on modifying the machine to integrate state recognition and the animations into one package. Previously, entering tape input was only accessible through an input field above the tape. Now when the transitions are compiled, they are automatically added to the middle of the tape and forward just like before. In addition to this change, the read head was modified to display the current state the machine is in. There was also functionality added to the controls below the Turing machine tape. This includes a *Step*, *Play*, and *Pause* control. The *Step* control is a button that performs one transition action and holds further transitions until pressed again. The *Play* button plays through each transition in succession until the accept state is entered or the *Pause* button is pressed. The *Pause* button halts the *Play* action when pressed.

In addition to helping round off the state recognition and animations, Jisue worked on optimizing the compiler functions and reorganizing errors and how they're handled. More work is needed to fully flesh out these changes. But these changes will help the team in the long run when debugging the project.

James Merenda spent this week working on some accessibility features for new users on their first visit to the website. This includes a welcome screen with multiple tooltips to ease the user into how the website operates. These features also need more fleshed out and are not in a presentable form at this time. Also additional research is necessary to utilize cookies so these accessibility features remember if the current user visited this website before so a familiar user is not subjected to reviewing previous tips. He also helped rough out the edges to the implementation of tape animations working with the state recognition functions.

Some problems the team faced during the week include the following. Brett George needed James Merenda's assistance in implementing the state recognition features with the animations. The issue turned out to be a bug with moving and writing output to the tape, creating race conditions. To fix this, implementations of calling functions in intervals were made to ensure that transitions were made one by one and not skipped through. There was also an issue involving transition speed to this implementation and needs further attention over the next week.

Plans for next week include the following. Brett George will continue fine-tuning the Turing machine with error-checking and additional testing. Jisue Lee will continue optimizing the compiler and further implement error handling routines. James Merenda will continue to work on the accessibility features and further research cookie implementations in JavaScript.