

EE/CprE/SE 491 WEEKLY REPORT 1

9/12/2019 – 9/30/2019

Group number: sdmay20-46

Project title: Intelligent Code Editor

Client & Advisor: Ali Jannesari

Team Members/Role:

John Jago – Software Lead

Keaton Johnson - Systems Lead

Jon Novak – Machine Learning Lead

Matthew Orth - Meeting Facilitator

Garet Phelps – Report Manager

Isaac Spanier – Test Lead

- **Weekly Summary**

The first sprint (2 weeks) was focused on researching tools and implementations for the user interface and classification/translation engine. This research helped us to determine the initial direction of the project.

- **Past week accomplishments**

- John Jago:
 - Researched IDE and text editor popularity
 - Determined that Visual Studio Code and IDEs based on the IntelliJ platform are what the majority of developers prefer based on several years worth of StackOverflow surveys

- Created Hello World plugins for both Visual Studio Code and the IntelliJ Platform to demonstrate the typical development process for a plugin as explained in the official documentation
- IntelliJ Platform feasibility assessment
 - Extended the hello world plugin to explore how a user could interact with the text editor to carry out the task of translating certain text to code: <https://git.ece.iastate.edu/jago/intellij-plugin-hello-world>
 - Determined that IntelliJ plugins would have all the necessary capabilities in terms of communicating with other programs that we will use to perform the actual English to code translation
- Keaton Johnson:
 - Research Natural Language Translation
 - Looked into previously existing natural language translation datasets.
 - Researched implementations and approaches to training a model for natural language translation.
- Jon Novak:
 - OpenNMT
 - Determining how to train the natural language model using OpenNMT
 - Continuing to research machine learning
- Matthew Orth:
 - Eclipse Plugin Development:
 - Created functionality to add a button to the Eclipse IDE for translation using plugin
 - Create functionality to select, view, and replace text in Eclipse IDE plugin
 - Created textbox functionality using Eclipse plugin to enter the natural language statement and expected translation
 - Created deployable plugin
 - Natural Language to Code Literary Analysis:
 - Researched current ways of implementing natural language to code translation
 - Determined that LSTM RNNs are the best approach for Neural Machine Translation (which is the domain for this project)
 - Learned about different considerations for dataset generation and training
 - Tool Research (OpenNMT):

- Researched OpenNMT for training Neural Machine Translation models
 - Determined how to train a model for language translation
 - Learned how to use Python Corpora as input to OpenNMT model
 - Garet Phelps:
 - VC Code extension
 - Researched how to use the vscode api to make a vscode extension
 - Made an extension that utilizes strategies that we may implement in the actual extension, such as modifying highlighted text.
 - Isaac Spanier:
 - NLP From Scratch
 - Bag of Words model
 - POS Tagging
 - Understood the processes and how to possibly use these for our project
 - Shallow Parsing
 - Understood the process and how to possibly use this for our project
 - Named Entity Recognition
 - Understood the process and how to possibly use this for our project
- **Pending issues**

○ **Individual contributions**

<u>NAME</u>	<u>Individual Contributions</u>	<u>Hours this week</u>	<u>HOURS cumulative</u>
John Jago	<ul style="list-style-type: none"> ● IntelliJ Platform plugin <ul style="list-style-type: none"> ○ Replaces highlighting text with other text from various data sources 	3	3
Keaton Johnson	<ul style="list-style-type: none"> ● Research NLP <ul style="list-style-type: none"> ○ Existing tools 	4	4
Jon Novak	<ul style="list-style-type: none"> ● Research with OpenNMT functionality 	3	3
Matthew Orth	<ul style="list-style-type: none"> ● Eclipse Plugin Replace and Textbox functionality 	30	30

	<ul style="list-style-type: none"> ● Natural Language to Code Literature Analysis ● Research tools (OpenNMT) with Python code corpora 		
Garet Phelps	<ul style="list-style-type: none"> ● VScode extension <ul style="list-style-type: none"> ○ Replace highlighted text 	5	5
Isaac Spanier	<ul style="list-style-type: none"> ● Researched NLP and NLP methods to use for our project 	4	4

- **Comments and extended discussion**
 - The first two week sprint consisted of researching and testing ways of creating the IDE plugin, mechanisms for natural language to code translation, and tools that are already created for this purpose.
 - This information will be used to begin developing the planned list of features.
- **Plans for the upcoming week**
 - John Jago:
 - Formalize / setup IntelliJ user interface environment
 - Keaton Johnson:
 - Research techniques for creating a dataset
 - Jon Novak:
 - Research pros and cons list for OpenNMT-py usage
 - Matthew Orth:
 - Research pros and cons list for OpenNMT-py usage
 - Garet Phelps:
 - Formalize / setup IntelliJ user interface environment
 - Isaac Spanier:
 - Research techniques for creating a dataset
- **Summary of weekly advisor meeting**
 - Met with Hung Phan (Grad student working with our client) Monday (9/9) at 9am to discuss more information about what is expected for the project.
 - Creating an Eclipse plugin that will allow translation from natural language to code

- Met with Professor Jannesari (our client) on Thursday (9/12) to discuss more information about the project.
 - Group will work in 2 week sprints and will meet with Hung every week and Professor Jannesari every other week
- Met with Hung on Friday 9/20 to discuss updates on our research progress
 - Planned out the following week's research work for the IDE plugin, literary analysis, and tool research