# Final Report

### Kingsley Kim

### December 11 2023

## 1 Overview

Since August 2023, I've continued to work under the Time-Series subgroup of
Dr. Judy Fox's AI4Science group. While my work in the summer was more
focused on understanding Temproal Fusion Transformers and their applications
to time-series, my research in the fall was focused on exploring interpretable and
explainable AI. This focused more on finding methods to explain the results
of a model, primarily through feature sensitivity. As a result, our group has
successfully submitted a paper to AAAI 2024.

## 2 Project: Sensitivity Analysis on Time Series

In order to describe my contributions/tasks I completed, I will describe my
tasks in a timeline. My first tasks were to familiarze myself with the different
deep learning models and the interpration models used in the paper and
in our repository, linked at: https://github.com/UVA-MLSys/COVID-19-age-
groups/tree/main. I did this by studying the papers of each of the models listed
in our paper, and reading the Captum library documentation for the interpra-
tion models.

Next, I worked on replicating all the experiments, by setting up the envi-
ronment and running them on the Rivanna servers, in order to gain lab skills
and experience. More specifically, I ran replication experiments on each of the
Top20, Top100, Top500 and total datasets for each of the six models. Through
this, I gained knowledge on using remote servers for high performance machine
learning. Once we had all our results, our group began to extend and improve
upon the original draft of our paper. My role here was to fully read and un-
derstand the draft as well as provide comments for improvement and minor
edits. Now, we are currently working on completing the project website to al-
low interested readers to explore more of our project and how to replicate for
themselves.

# 3   Future Planning

At the moment, I am not sure whether I plan to continue to work in this research group. If I do, I plan on continuing to work on the website as well as start exploring the Financial Aid dataset. If I decide not to continue, I am very thankful for being able to work in this research group and be granted this opportunity.