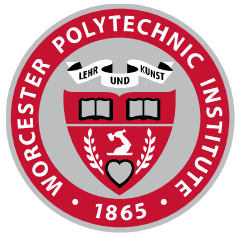


WPI

Human Context Recognition: A Controllable GAN Approach

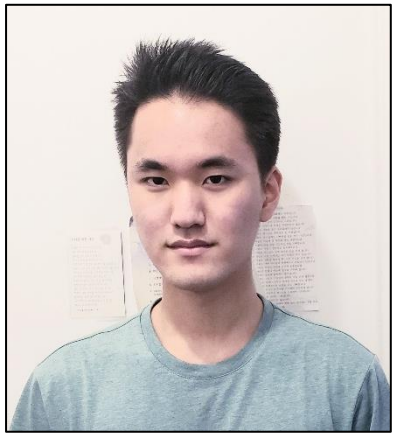
Joshua DeOliveira, Worcester Polytechnic Institute
Harrison Kim, Northeastern University
MaryClare Martin, College of the Holy Cross

Faculty Advisor: Prof. Elke Rundensteiner
Ph.D. Mentor: Walter Gerych

Funded by NSF Grant #1852498

Our Team

MaryClare Martin



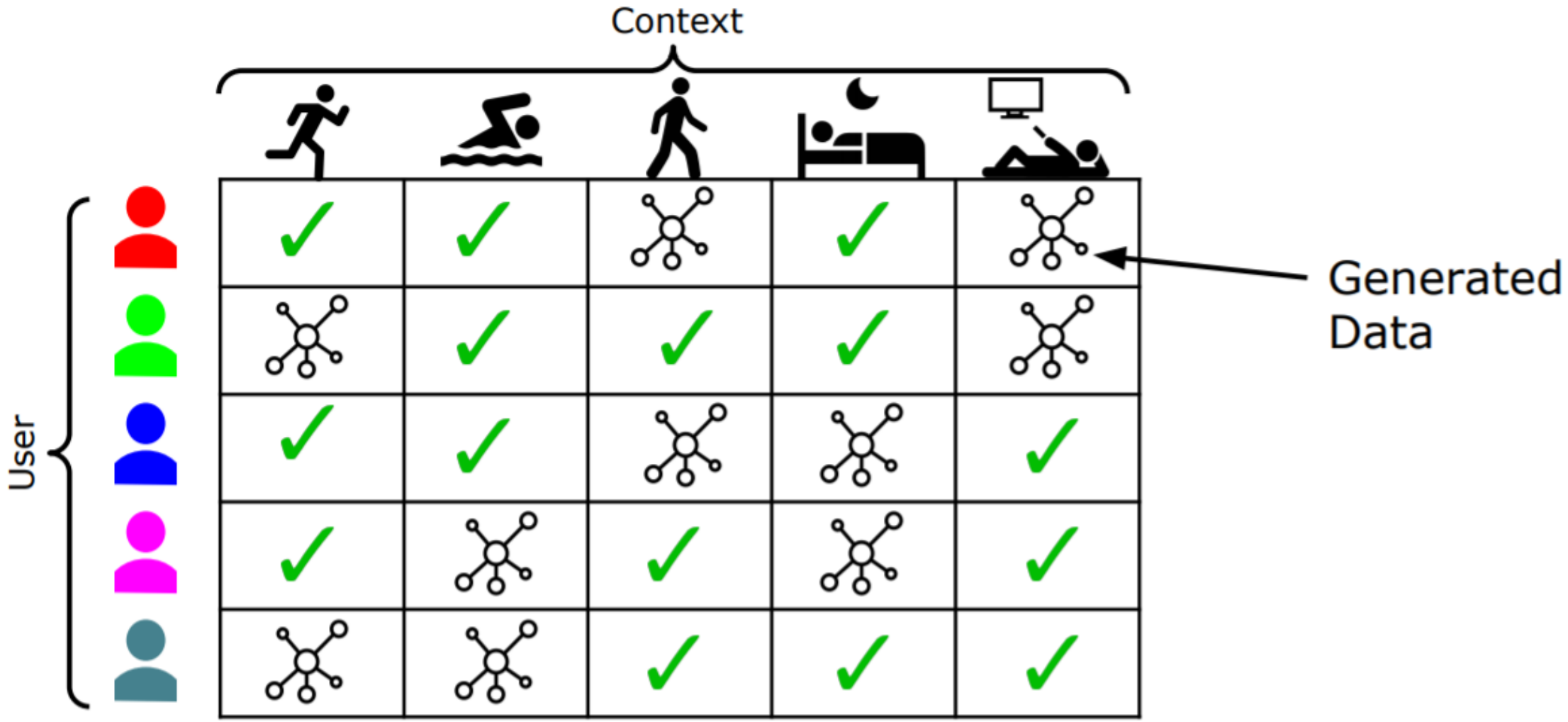
Harrison Kim

Joshua DeOliveira

Prof. Elke Rundensteiner

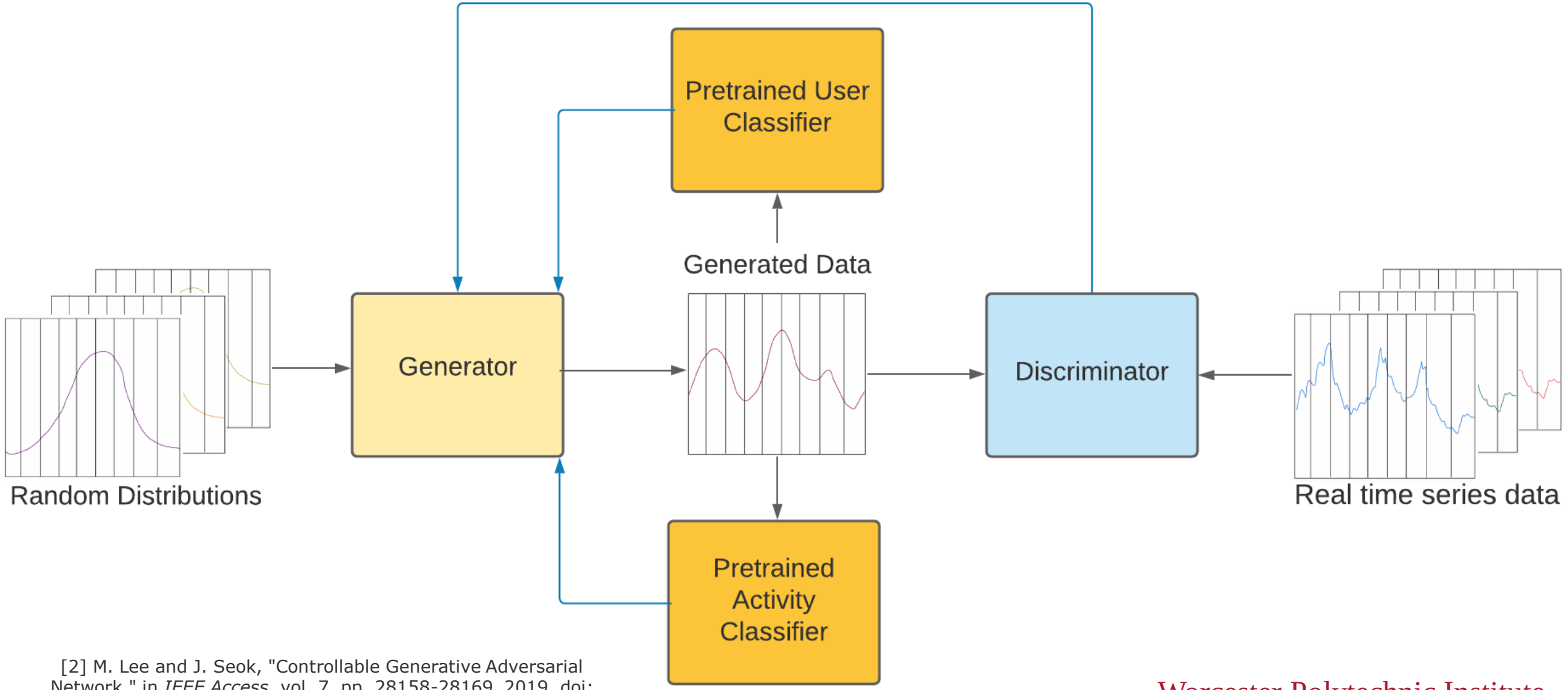
Ph.D. Mentor Walter Gerych

Research Problem & Motivations



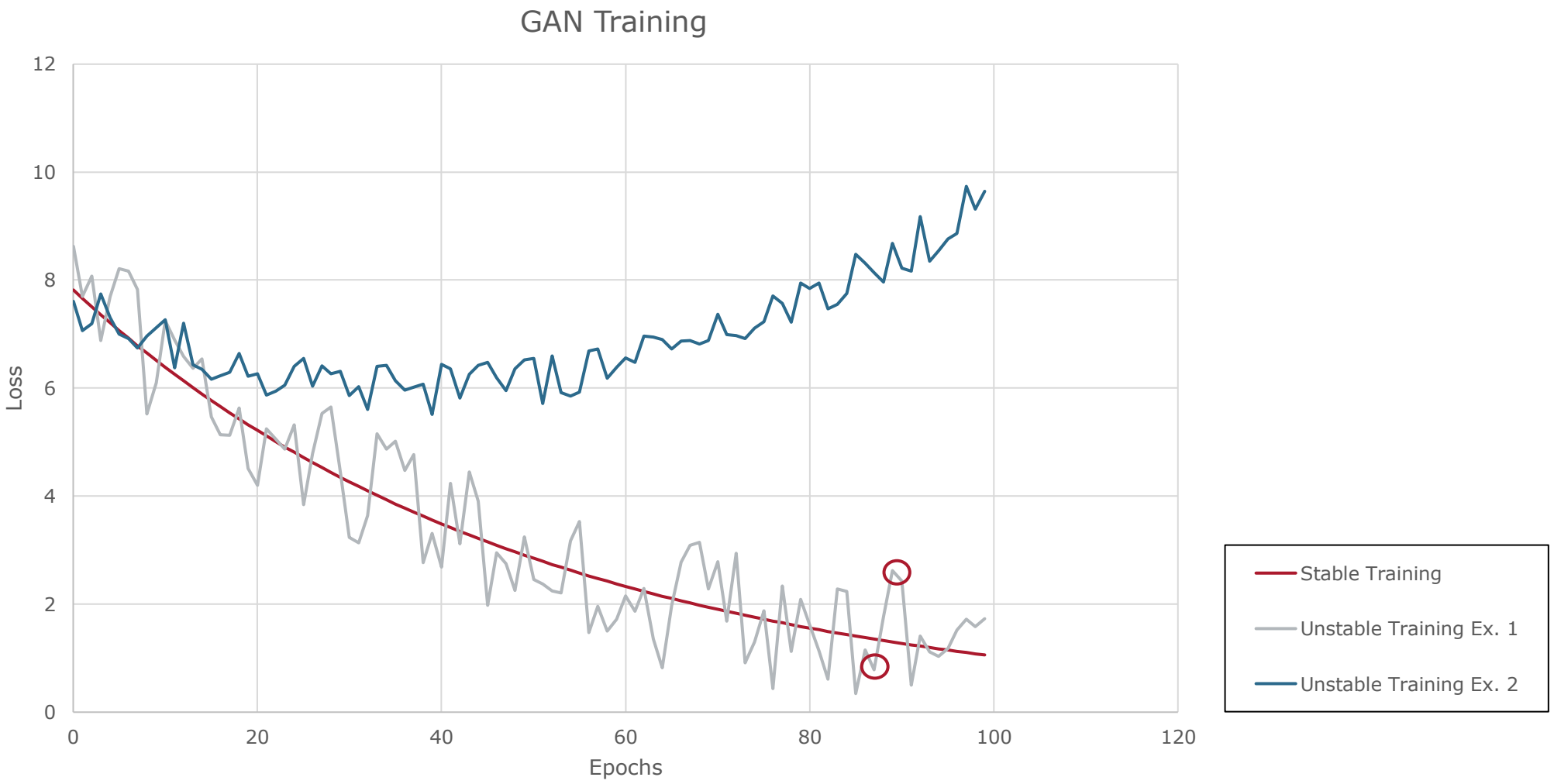
[1] Y. Vaizman, K. Ellis and G. Lanckriet, "Recognizing Detailed Human Context in the Wild from Smartphones and Smartwatches," in IEEE Pervasive Computing, vol. 16, no. 4, pp. 62-74, October-December 2017, doi: 10.1109/MPRV.2017.3971131.

Controllable GAN



[2] M. Lee and J. Seok, "Controllable Generative Adversarial Network," in *IEEE Access*, vol. 7, pp. 28158-28169, 2019, doi: 10.1109/ACCESS.2019.2899108

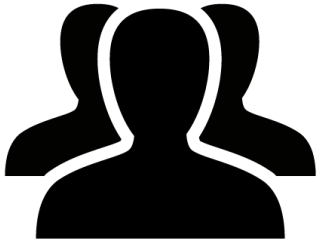
Obstacles & Setbacks



Obstacles & Setbacks

ExtraSensory Dataset

Mutually Exclusive Labels



60 Users

Multilabels

51 Activities

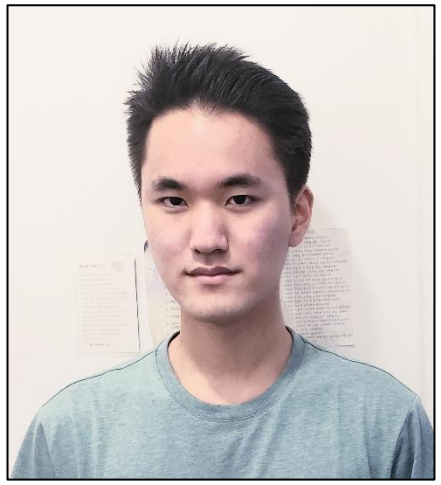
Our Work

Joshua DeOliveira

- Performed training tests to demonstrate the efficacy of our novel GAN training methodology.
- Implemented metrics for evaluating model performance during and after training.

MaryClare Martin

- Organized the code database by modularizing the data loading and training process.
- Tuned various hyperparameters to optimize model performance.



Harrison Kim

- Trained user and activity classifiers for the project's Controllable GAN.
- Built data visualization and pre-processing tools for evaluating model performance.

Next Steps

Weekly Timeline	Project Goals
6 (June 28th - July 2nd)	Update GANs for time-series generation
7 (July 5th - July 9th)	Begin working on research paper
8 (July 12th - July 16th)	Start experimentation for paper
9 (July 19th - July 23rd)	Have all results for paper completed and begin working on the final presentation
10 (July 26th - July 30th)	Finalize presentation and complete final edits for paper