**Journal Report 4**

**9/15/23**

Today, I turned in my proposal. I made some last-minute edits. Afterwards, I researched some more. I watched a video on what Generative Adversarial Networks (GANs) were. I did further research by compiling a notebook I found on Github that showed the process of the GAN architecture. This is the link to the video <https://www.youtube.com/watch?v=TpMIssRdhco>.

**9/18/23**

I sent a follow up email to my mentor Paul Kienzle on the progress of my registration for the NCNR. He sent me an email back saying that he should get more information soon. Additionally, he found another dataset that I could preprocess and extract two-way signals with one being the temperature controller and the other the set-values.

**9/20/23**

Today, I created my goals that I want to accomplish in two weeks. I recorded these milestones and I hope to discuss them with Dr. Gabor, hopefully, on 9/22/23. I got an update on my registration status. It stated that I was now registered and I needed to come to the NCNR to pick up my computer and YubiKey for remote access of the GPU clusters. I plan to go on 9/24/23 as there is no school that day. In addition to responding to emails, I started researching time series simulation with GANs. Since I have foundational knowledge from the video I watched on 9/15/23, I was able to understand the research problems and potential fallbacks of this method. I hope to complete a GAN simulation on relatively simple time series data that I find on the Internet before I apply it to my multivariate data. The paper that I looked at is here <https://arxiv.org/abs/2202.02691>. The main message I got from my brief skim was that RNN-based GANs suffer in terms of performance and accuracy of the simulated data because it cannot effectively model long sequences of data points with irregular temporal relations, which is what some of my CCR data contains.