

## **Thesis Portfolio**

**Canary-Coalminer Bot: Measuring Messaging Latency**  
(Technical Report)

**The Role of Latency on Gaming Experience**  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
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## **Sociotechnical Synthesis**

### **Introduction**

Last summer I worked for an internal messaging platform for the largest cloud provider globally. The messaging platform was a novel system, and lacked necessary diagnostic tools that would allow engineers to analyze system delays and outages. My technical project was started to fill this niche in the system, and so my work focused on creating a tool to generate network delay and sending it to a data dashboard for visualization. This technical work showed me the importance of visualizing latency metrics, and I started considering how latency affects other online spheres. The sphere I focus on in this paper and which my research is centered around is online gaming. Online gaming has become a large social, cultural, and economic force, and is a sector that is highly reliant on internet speeds and low latencies. In these papers I will provide further details of the results of my technical work, and the findings and implications of my STS research.

### **Technical Work**

In my technical work, I designed and created a pair of bots that send pings to the other on regular intervals. The pings would contain important metadata, but most importantly would house the timestamp of the send time, and the other bot would be able to calculate the difference in timestamps and measure the ping. Lastly, the ping data would be sent to a CloudWatch dashboard that could show the percentile summaries and determine when anomalous spikes occurred.

### **STS Research**

For my STS portion, I delved into the implications and effects of poor network latency on the online gaming world. Through analyzing case studies and prior research, I found that latency not only greatly inhibits players' experiences, but also limits the formation of gaming communities and the economic potential of many business avenues for online gaming. I also suggested tactics to improve network delay for online systems.

## **Conclusion**

The technical and STS projects I led both pertained to latency and the importance of latency in our society. In my technical portion, I described how I could practically create a workflow to create ping metrics that can be used by engineers to diagnose problems with the system and respond proactively. I took this technical background to research into how important latency is in online gaming, and gained better perspectives on the social, cultural, and economic impacts of poor ping. The ethical importance of my STS research reinforced the necessity of proper latency for me and gave credence to my technical work.