**CSSE Department. Senior Thesis Proposal.**

**Name**: Christian Meinzen

**Tentative Title of Senior Thesis:** *Detection of Cryptographic Algorithms using Machine Learning from Packet Sniffed Information*

**Please provide a brief explanation of the project.**

I am attempting to solve the problem of determining the type of cryptographic algorithm used to shield data using machine learning based upon data recovered from network traffic by packet sniffing. The two major components that breaks down this project is (1) data collection from packet sniffing and (2) developing the machine learning algorithms.

The background knowledge necessary to accomplish this project includes understanding how and what can be extrapolated from packet sniffing that will help determine different cryptographic algorithms. Most of the research behind this will be provided by past papers. Also, different cryptographic algorithms usually relate to different network protocols, which needs to be specified before generating the machine learning algorithms.

My contribution will be relating the packet information to cryptographic algorithms using machine learning. In other words, I will be using different ML algorithms (classification and regression) to relate the features generated by packet information to predict the cryptographic algorithms used to generate the cyphertext.

**Your background.**

I have taken Machine Learning, Computer Networks, Computer Security, and Cryptography within my time at Rose. These courses will be the strong background that I need for completing this thesis. Packet sniffing requires both and understanding of network protocols and some security mechanisms. The detections of cryptographic algorithms will rely heavily on the understanding of machine learning and cryptography. It is also worth mentioning that I am currently a TA for Machine Learning, which demonstrates my understanding of the topic along with gaining a refresher of topics. Also, I have done independent “research” within computer networking and packet sniffing on my home network. This practice was not formal but was self-taught/led.

**With which faculty have you discussed your proposal. Are there any additional advisors?**

I have discussed this topic with Dr. Nate Chenette given his background in Cryptography and interest in machine learning. I have been given a confirmation to move forward with a proposal, but not a guarantee for advisership.