**CSS 497 Abstract Form**

**Name**: Andrzej Dawiec

**Faculty Advisor**: Michael D. Stiber, Ph. D.

**Quarter/Year**: Summer 2023

**Title**: **Developing Graph-Based Systems With Graphitti**

**The abstract should be limited to 200-400 words describing the nature of the project and the results obtained. The abstract is due prior to submission of your final report to your faculty advisor**.

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| The Intelligent Networks Laboratory ran by Professor Michael Stiber aims to understand computational neuroscience and apply that knowledge towards a wide range of problems. Under Professor Stiber’s guidance, I worked with a team of graduate and undergraduate students on the Graphitti project which leverages desktop hardware to perform supercomputing capabilities.  Having the ability to run on CPU and GPU applications, my main objective is to benchmark the build efficiency of the Graphitti simulation. On a single core CPU, such as the GitHub testing space simulation, the build took roughly three minutes to compile. With multi-core CPUs in use, the build time reduces to around twenty seconds – An 86 percent improvement of the build time. This change led to significant improvements in the performance of the Graphitti simulation. Given that the Graphitti project has uses in 911 public safety systems, high performance is critical for these types of systems. I was also given the responsibility of updating the documentation for the system, which helped me learn both technical and non-technical skills.  This project also allowed me to collaborate with others through the code via GitFlow. Working on a large-scale project with multiple people, it can be hard to track new features along with implementing them into the main code. With GitFlow, I drew up the documentation with tools such as PlantUML in order to clean up the code and improve the project for incoming students.  Overall, this project provided me with valuable learning experiences in addition to the technical coding skills I gained with such a large data program. Working on a project that has been well-developed already, it was essential to gain a deep understanding of the codebase in order to identify areas to improve and document.  After deep-diving into a variety of issues in Graphitti, this project offered technical knowledge and valuable experiences in teamwork, communication, and project management which I will carry towards future engineering experiences. |

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**Student Name**: \_\_\_\_Andrzej Dawiec **Signature**:\_\_\_\_\_*Andrzej Dawiec*

**Faculty Advisor**:\_\_\_ Michael D. Stiber, Ph. D **Signature**:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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