**MGTA 611 Business Application of Artificial Intelligence**

**Deep Learning Project Proposal**

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**Dataset**

The electricity market is a complex and dynamic system that is critical for the functioning of modern societies. Understanding the behavior of individual generators and the factors that impact the reliability of the electric system is crucial for ensuring the stability and security of the power grid. I propose a deep learning project that aims to investigate the behavior of individual generators in the electricity market of the MISO South region during major weather events. The project will use a combination of publicly available data on the MISO South electricity market and natural gas pipelines. The MISO Market Reports offer detailed analysis and status of market operations related to all aspects of real-time and day-ahead.

**Business Problem**

This project aims to investigate the behavior of individual generators to understand the major factors impacting electric system reliability under major weather events like the cold front that affected Texas in February 2021. This will help to improve the reliability of the electric system and avoid extended blackouts such as the one experienced by Texas. The results from this project will be valuable for policymakers, regulators, and market participants, since it can improve the stability and security of the power grid. My project will also contribute to the advancement of state-of-the-art in deep learning methods for simulating market outcomes.

**Technical Problem**

This project will develop a new method to simulate market outcomes under certain conditions in electricity markets. This will be achieved by using a neural network and work with the Keras and TensorFlow library in Python. This will capture the complex relationships between the different variables in the dataset. I will use optimization techniques to fine-tune the models and improve their performance. By using a combination of different neural networks, I can gain a better understanding of the energy market and identify factors that impact the reliability of the electric system.