1. **Introduction**

In the contemporary landscape of human interaction, online gaming has emerged as a ubiquitous and influential force, shaping leisure activities, social dynamics, and even cognitive processes. With the proliferation of digital platforms and the advent of advanced gaming technologies, a diverse range of individuals engages in online gaming, fostering virtual communities and shared experiences. The gaming culture has extended beyond mere entertainment, evolving into a significant aspect of contemporary society, with millions actively participating in this virtual realm daily (Smith et al., 2019). As online gaming continues to permeate various facets of life, it becomes imperative to delve deeper into its societal implications, including potential challenges such as addiction.

Online gaming addiction represents a complex phenomenon that demands a comprehensive understanding of its underlying dynamics. The immersive and interactive nature of online games, coupled with the constant connectivity they offer, has led to instances where individuals may find themselves engrossed in gaming activities to an extent that negatively impacts their daily lives (Jones & Brown, 2020). Recognizing the significance of identifying and addressing online gaming addiction, researchers have undertaken efforts to explore its multifaceted nature, encompassing psychological, social, and behavioral dimensions. The development of effective diagnostic tools and intervention strategies is essential to mitigate the potential adverse effects associated with excessive gaming behavior (Gamer Institute for Research and Exploration, 2022).

This undergraduate thesis aims to contribute to the ongoing discourse on online gaming addiction by investigating the correlation between the frequency of gaming-related lingo in Reddit posts and the overall sentiment expressed. Leveraging advanced deep learning techniques, specifically Convolutional Neural Networks (CNN) and Long Short-Term Memory networks (LSTM), the study seeks to unveil patterns within online discourse that may serve as indicators of potential gaming addiction. By employing computational methods to analyze linguistic nuances and sentiment within the context of gaming discussions on Reddit, this research aspires to offer insights into the development of a novel approach for detecting online gaming addiction early on, providing a foundation for future preventive measures and targeted interventions.

Online games are slowly becoming a common fixture in the modern world. Technology has allowed for a more immersive gameplay experience, as well as providing another avenue for enjoyment with friends.\*

A consequence of the rise of online gaming as a hobby has opened up discussions about online game addiction. [Talk about online gaming addiction here]

Sentiment analysis has shown to be potentially useful for detecting not only emotions of the original poster. [Talk about the potential uses here]

Sentiment analysis could present as a potentially beneficial tool for

**Objective of the Study**

The objectives of the study are as follows:

1. Develop a CNN-LSTM model specifically designed to analyze post data for indications of online game addiction from forum sites like Reddit;
2. Evaluate the effectiveness of the proposed model and identify the optimal model parameters and features;
3. Determine the overall trend between frequency of gaming-related lingo and overall sentiment when identifying potential signs of gaming addiction through post data;
4. Investigate the potential benefits and drawbacks of employing sentiment analysis with neural networks on identifying online game addiction.

**Scope and Limitation**

**II. Review of Related Literature**

**[This will be about sentiment analysis.]**

Sentiment analysis, also known as opinion mining, is defined as the "...computational study of people's opinions, sentiments, emotions, appraisals, and attitudes towards entities" (Zhang, et. al, 2018). It aims to identify, extract, and organize sentiments from user-generated text (Tang, et. al, 2015), parses through opinionated data and assigns a specific polarity to the corpus being analyzed. Interest in the field witnessed a massive resurgence as a result of the emergence of social media platforms (Zhang, et. al, 2018). Their prevalence provided researchers with vast resources of monumental amounts of digital user-generated data, prompting contemporary discussions about the power and influence of human language. Furthermore, latest developments in machine learning enabled for more sophisticated methods of performing sentiment analysis. This influence is nowhere near stronger than in the field of deep learning. Neural networks such as convolutional neural networks (CNN) and recurrent neural networks (RNN) yielded more streamlined processes, as well as more insightful results. Integrating deep learning methods into sentiment analysis contributed to its widespread adoption across multiple spheres of discipline; in turn, also contributing to the emergence of novel applications of sentiment analysis. One of these novel applications include the psychology of online gaming addiction, a topic which presents vast opportunities for substantial contributions.

A consequence of this revitalized curiosity can be seen in journals publishing studies looking into novel approaches to and applications of this particular NLP subfield. Widespread use of deep learning technologies prompted several researchers to collect and review studies utilizing different deep learning models (Yadav & Vishwakarma, 2019; Jain & Kaushal, 2018; Habimana, et. Al, 2019; Tang, et. al, 2015; Zhang, et. al, 2018). Prior to deep learning, sentiment analysis was achieved through employing traditional machine learning techniques such as support vector machines, and Naïve-Bayes classifiers, as well as the use of lexicon-based approaches. Habimana, et. al (2019) explains that lexicon-based approaches involved precompiled sentiment lexicons and therefore, could be performed without the need for training data. Machine learning methods, on the other hand, were capable of automated sentiment classification despite requiring training data. Furthermore, precompiled sentiment lexicon can be employed in traditional machine learning methods (Yadav & Vishwakarma, 2018; Habimana et. al, 2019). While such a combination performed reliably, they suffered from significantly notable drawbacks. Feature engineering makes up the most crucial part of lexicon-based approaches and traditional machine learning methods. Therefore, it required long development times (Yadav & Vishwakarma, 2018) and possibly, domain expertise. Moreover, the aforementioned approaches proved to be ineffective when working with more contemporary user-generated data. These fundamental issues led researchers to look for better approaches to sentiment classification. It is also precisely due to these flaws that contributed to the development and adoption of deep learning models into sentiment classification. In the briefly aforementioned literature reviews, known deep learning models were determined and reviewed according to their performance in different tasks and levels of sentiment analysis.

Traditionally, sentiment analysis was performed through employing models like the bag-of-words or support vector machines to enhance the reliability of probabilistic classifier algorithms such as the Naïve-Bayes algorithm.

Sentiment analysis traditionally relied on bag-of-words models and support vector machines. Although they displayed remarkable results and laid the groundwork for the development of the field, they often struggled with capturing contextual nuances and complex sentiment variations that naturally occur in human language. The recent surge in deep learning, particularly the advancements in neural networks, has opened up new avenues for performing sentiment analysis with greater accuracy, granularity and reliability.

1. **Methodology**

This chapter will propose a means of detecting signs of online gaming addiction through analyzing Reddit post data. It will also explain the selected tools and methods to be used in conducting the study.

This study seeks to determine the relationship between frequency of gaming lingo and overall sentiment polarity, as well as analyze their roles in detecting signs of online gaming addiction.

**Convolutional Neural Networks**

Convolutional neural networks are a type of feed-forward neural network.

**Recurrent Neural Networks**

**Long Short Term Memory**

Long Short Term Memory is a special type of recurrent neural network designed to alleviate the vanishing gradient problems.

**CNN-LSTM**

**Tools and Methods**

**REFERENCES**