My initial review of the course readings established a clear business case for Artificial Intelligence, highlighting how Machine Learning (ML) creates value through automation and smarter decision-making [1], and how Deep Learning (DL) provides the specific tools to solve complex business problems [2]. **You will notice that I am including numerical citations throughout my writing in this portfolio. I believe this is a crucial practice, not only to properly credit the sources I am learning from, but also to share the additional research I've found. This way, my professor and classmates can easily see the context behind my statements and explore these valuable resources for themselves.**

With that foundation, my own research led me to the breakthrough Transformer architecture, introduced by Vaswani et al. [3], which revolutionized the field by allowing models to weigh the importance of different words in a sentence through an "attention mechanism." This is the core innovation behind powerful, context-aware models like BERT and GPT. It is now clear to me that ML is the broad discipline, DL provides the multi-layered neural network structure, and cutting-edge architectures like the Transformer are what give Natural Language Processing (NLP) its remarkable ability to grasp context and nuance in human language.

Building on this, **I expect this course to transition me from theoretical knowledge to practical application.** I am eager to go beyond just discussing neural networks and delve into the mechanics of implementing and fine-tuning Transformer-based models for specific tasks. My reading of recent survey papers, such as the one by Al-Twairesh et al. on deep learning for sentiment analysis [4], has illuminated the vast potential of this technique for gauging customer opinion from unstructured text. Therefore, I hope to learn not only how to build a functioning NLP model, but how to preprocess raw data, apply it to a real-world problem like analyzing product reviews, and critically evaluate its performance.

Looking toward my future career as an IT professional, I see these competencies as non-negotiable. The ability to work with advanced NLP models is a critical differentiator in fields from software development to data science. For instance, instead of just building a static application, I could develop systems that dynamically understand user intent from support tickets or chat logs.. In a data analytics role, I could perform large-scale sentiment analysis on social media feeds to provide real-time strategic intelligence to a company. I see ITCC508 not just as a course in deep learning, but as a crucial training ground for mastering the state-of-the-art tools that are actively shaping the future of human-computer interaction and business intelligence.

References

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