Independent Study Proposal

# Paper Title

“A Review of the Impact of Deep Learning in Practical Contemporary and Near-Future Applications in the 21st Century”

# Aim

To research and study the current applications, techniques and implementations of deep learning used in the current day. This paper will focus primarily on extant or near future applications, looking to summarise the current progress in using deep learning as a tool for real scientific, medical, commercial and industrial use. Attention will be primarily paid to areas that have widespread applications or strong potential for marketing to a global market. The primary goal of the paper will be to assess what future innovations and changes we can expect to see in the 21st century from deep learning, specifically significant changes that will impact the average person’s life.

# Plan of Work

1. Research and collect sources of information on deep learning from journals, conference proceedings and other current academic sources
2. Obtain approval on the proposal given.
3. Write an initial draft for an introduction to the general topic of deep learning and the methods of information gathering
4. Summarise current material gathered and obtain initial conclusions, completing the 1st draft
5. Further research and gathering of sources into areas of interest and aspects that are discussed but require more detail. Make changes according to feedback on 1st draft
6. Summarise new sources and integrate new information into a more detailed and comprehensive summary
7. Form final conclusions from summary of the topic, concluding with results of study, completing a 2nd draft
8. Revise paper for a 3rd draft, using any feedback I may have obtained
9. Final proofread and hand-in

# Initial More a Narrative than 1st Draft Methodology

An initial search performed on the University of South Wales Library portal, looking for articles associated with deep learning. For this purpose, I used multiple searches using the additional key words of “medical”, “scientific”, “commercial”, “industrial” and “applications”. An initial selection process involved picking articles and conference proceedings based on their relevance to deep learning. From here I went into each article and downloaded a PDF copy where available and any associated articles I could find that were presented on the website. I found a large quantity of articles available, particularly on the website “ScienceDirect” and downloaded a few dozen linked articles. Going further, I searched directly on the ScienceDirect website for articles on deep learning and found many. I then followed this up with a set of searches on google scholar, JSTOR, arXiv and Jurn. JSTOR unfortunately has a paywall preventing me from using that source but I obtained many useful articles from google and Jurn. Of note several of these journal search engines linked to each other and my searching involved going back and forth between different websites. This initial data gathering was to find a great deal of material on the subject I am covering, followed by a later culling of inappropriate or poor sources.

My initial gathering of articles en masse without appreciable quality control yielded 93 articles of interest about deep learning. All articles gathered mention deep learning within the title or the abstract. I will cull this greatly through a skim read of the article to determine the suitability of each article to this review paper. Approximately 30 articles were carefully picked out one by one in a manual fashion. The remainder were collected through links to associated papers.

# Useful References

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Huval, B., Wang, T., Tandon, S., Kiske, J., Song, W., Pazhayampallil, J., Andriluka, M., Rajpurkar, P., Migimatsu, T., Cheng-Yue, R. and Mujica, F., 2015. An empirical evaluation of deep learning on highway driving. *arXiv preprint arXiv:1504.01716*.