**Literature Review Outline**

**Subject: Implementing Deep Learning Tools and Techniques in Predicting Football Results**

**Introduction**

An overview of the current practical application of deep learning tools and techniques in predicting football results. First, what the aim of the technology is and introduction to any domain-specific jargon. Moves into who uses the technology, why it is of interest.

**Current state of the domain (broad overview)**

How well the current approaches work. Are predictions broadly accurate or inaccurate. Why is that the case? What are the known limitations in current approaches that act as bottlenecks to further progress? What frameworks exist for the application (Rahman, 2020)?

*The following sections constitute the detail sections of the literature review. The aim is to explore the detailed sub-topics of the field. As the literature review has not yet been carried out, the details of these sections may change depending on the information that is found in the initial (broader) stages of review. The following sections are assumed from the brief research that has been done so far.*

**Selection of deep learning network type**

Introduction to the different deep learning network types and the identification of the type of neural network most likely to have the best performance in this kind of prediction. Examples of the research on different network types in specifically predicting football results. Presented chronologically(?), with most successful network type highlighted (Tiwari et al., 2020).

**Datasets and data collection**

What datasets are commonly used for building prediction models? Which data points are common amongst various literature? Are there any noticeable gaps in the data which could be of interest, which have maybe been missed? Are there limitations of deep learning which apply to certain types of data which could be useful for this application?

**Approach to data modelling**

Typical probabilistic models used in football result prediction. Any grouping between modelling approaches and other subtopics (such as type of deep learning network used) to be identified. Examples of non-standard or new approaches to modelling (Razali, 2022; Rodrigues & Pinto, 2022).

**Classification**

What approaches are taken to classification of football results? What levels of success are achieved currently? Are there any suggested approaches which can improve classification, and what is the associated cost (Muszaidi et al., 2022)?

**Conclusion**

Summary of the current state of football result prediction based on literature identified, including what appears to be the most successful and widely-accepted approach given the specific areas identified in the previous sections. Introduction of areas of interest where literature is lacking - what needs to be done next to further the field.

**References**

Muszaidi, M., Mustapha, A.B., Ismail, S. & Razali, N. (2022) ‘Deep Learning Approach for football match classification of English Premier League (EPL) based on full-time results’, *Proceedings of the 7th International Conference on the Applications of Science and Mathematics 2021: Sciemathic 2021.* Online, 27-28 October. Singapore: Springer Nature Singapore. 339-350.

Rahman, M.A. (2020) A deep learning framework for football match prediction. *SN Applied Sciences* 2(2): 165.

Razali, N., Mustapha, A., Arbaiy, N. & Lin, P.C. (2022) ‘Deep learning for football outcomes prediction based on football rating system’, *10th International Conference on Applied Science and Technology.* Kuala Lumpur, Malaysia, 25-26 October. New York City: American Institute of Physics. 040007.

Rodrigues, F. & Pinto, Â. (2022) Prediction of football match results with Machine Learning. *Procedia Computer Science* 204: 463-470.

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