

# Journal of Machine Learning

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## **A Brief Survey on the Approximation Theory for Sequence Modelling**

**Author:** Haotian Jiang, Qianxiao Li, Zhong Li & Shida Wang

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### **Summary for general readers:**

Sequence modelling has a wide variety of applications in natural language processing, finance, control engineering and other fields. However, theoretical understanding of the various machine learning models used are incomplete. In this paper, we survey both classical and recent results on the approximation theory for sequence modelling using machine learning, including recurrent neural networks, temporal convolutional networks, encoder-decoder and attention-based models. The goal of this survey is to summarise the current understanding of approximation theory for learning sequential relationships, and to outline some future research directions.