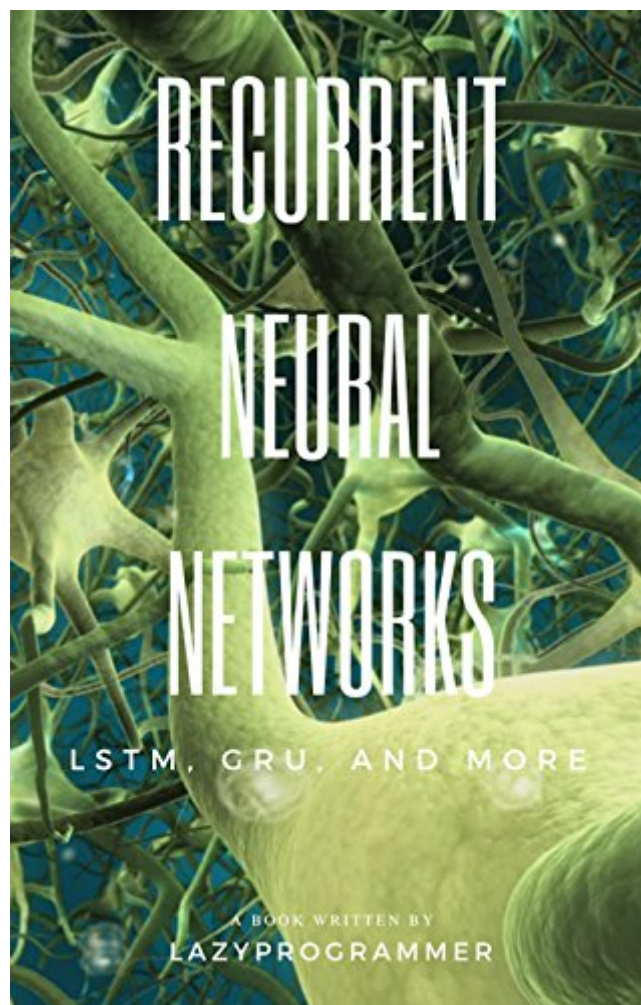# Deep Learning: Recurrent Neural Networks In Python: LSTM, GRU, And More RNN Machine Learning Architectures In Python And Theano (Machine Learning In Python)

Synopsis

LSTM, GRU, and more advanced recurrent neural networksLike Markov models, Recurrent Neural Networks are all about learning sequences - but whereas Markov Models are limited by the Markov assumption, Recurrent Neural Networks are not - and as a result, they are more expressive, and more powerful than anything weâ ™ve seen on tasks that we havenâ ™t made progress on in decades.In the first section of the course we are going to add the concept of time to our neural networks.Iâ ™ll introduce you to the Simple Recurrent Unit, also known as the Elman unit.We are going to revisit the XOR problem, but weâ ™re going to extend it so that it becomes the parity problem - youâ ™ll see that regular feedforward neural networks will have trouble solving this problem but recurrent networks will work because the key is to treat the input as a sequence.In the next section of the book, we are going to revisit one of the most popular applications of recurrent neural networks - language modeling.One popular application of neural networks for language is word vectors or word embeddings. The most common technique for this is called Word2Vec, but Iâ ™ll show you how recurrent neural networks can also be used for creating word vectors.In the section after, weâ ™ll look at the very popular LSTM, or long short-term memory unit, and the more modern and efficient GRU, or gated recurrent unit, which has been proven to yield comparable performance.Weâ ™ll apply these to some more practical problems, such as learning a language model from Wikipedia data and visualizing the word embeddings we get as a result.All of the materials required for this course can be downloaded and installed for FREE. We will do most of our work in Numpy, Matplotlib, and Theano. I am always available to answer your questions and help you along your data science journey.See you in class!â œHold up... whatâ ™s deep learning and all this other crazy stuff youâ ™re talking about?â •If you are completely new to deep learning, you might want to check out my earlier books and courses on the subject:Deep Learning in Python https://www..com/dp/B01CVJ19E8Deep Learning in Python Prerequisities https://www..com/dp/B01D7GDRQ2Much like how IBMâ ™s Deep Blue beat world champion chess player Garry Kasparov in 1996, Googleâ ™s AlphaGo recently made headlines when it beat world champion Lee Sedol in March 2016.What was amazing about this win was that experts in the field didnâ ™t think it would happen for another 10 years. The search space of Go is much larger than that of chess, meaning that existing techniques for playing games with artificial intelligence were infeasible. Deep learning was the technique that enabled AlphaGo to correctly predict the outcome of its moves and defeat the world champion.Deep learning progress has accelerated in recent years due to more processing power (see: Tensor Processing Unit or TPU), larger datasets, and new algorithms like the ones discussed in this book.

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