

## TO WHOMSOEVER IT MAY CONCERN

I am an Assistant Professor at the Indian School of Business, Hyderabad. My research interests include behavioral finance, empirical asset pricing, and institutional investing. At the Centre of Analytical Finance, we have recruited more than 50 research interns in the last seven years. Most of them are now Ph.D. and masters' students at top schools such as MIT Sloan, Chicago Booth, NYU Stern School of Business, London Business School and many others. I recruited Devansh Chandak as a research intern for December 2019.

Let me elaborate on the work Devansh did as an intern here. He worked on studying the interactions and correlations between the prices of stock futures using Deep Learning. He used his knowledge of Natural Language Processing to develop an intuitive approach to storing the history of stock futures in the form of a vector using an embedding model for the corresponding tickers, similar to how the embedding of a word in NLP represents the meaning and the context words usually appear. Further, he applied an LSTM to model time series data, i.e., the hourly prices of a variety of stock futures to forecast future prices. He performed several experiments to determine the longevity of past returns in predicting future returns, such as applying attention over different lookback windows, varying the retraining period, etc.

Although he was working with such algorithms for the first time, he was very quick at understanding a new area, designing efficient algorithms and implementing them. One of the main challenges was the huge amount of training data, which required the construction of efficient code. The forecasting analysis provided useful insights for further research.

He did not miss the deadlines. The internship was for one month, but he worked overtime and on weekends and was committed to the work.

I am sure that he will be an excellent addition to your program. I strongly recommend him to your program.

Nitin Kumar  
Assistant Professor  
Indian School of Business

Email: [nitin\\_kumar@isb.edu](mailto:nitin_kumar@isb.edu)