

**A MACHINE LEARNING-BASED JOB FORECASTING AND
TREND ANALYSIS SYSTEM TO PREDICT FUTURE JOB
MARKETS USING HISTORICAL DATA**

Sharanjaa Senthurvelautham

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Department of Computing

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Robert Gordon University**

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Abstract

Over the last two decades, technological advancements have created more job markets and job opportunities than ever. With the ever-increasing demand, it has become vital for academic institutions and businesses to keep up with employment requirements. The problem is more severe for modern and rapidly evolving industries such as software development. This study implements a prediction system for job trends to enable job seekers, organizations and academic institutions to understand and align their endeavours to match the market requirement. Employers can benefit from the system by using it to identify potential talent shortages and proactively address them. Policymakers can also use the system to understand the potential impacts of changes in the job market on the economy, enabling them to make informed decisions about supporting employment growth.

The prediction is made possible by creating a rich dataset based on more than 522,180 job listings from the past 24 months in the software industry. The dataset is fed to a Bidirectional LSTM model to predict the future trends of the job market for various roles and technologies. Autoaggressive prediction is implemented using the bi-directional LSTM model as this combination proves to produce the most accurate results after multiple quantitative analyses and evaluations. This study evaluated the proposed solution against known real-world data and it was concluded that the system can predict the job trend for at least the next 12 months with a relatively high accuracy of 95.71%.

Keywords: Bi-directional LSTM, Deep Learning, Job Market, Trend, Software Industry, Autoaggressive prediction