

Big Data in Telecom Industry: Effective Predictive Techniques on Call Detail Records

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Abstract : Mobile network operators start to face many challenges in the digital era, especially with high demands from customers. Since mobile network operators are considered a source of big data, traditional techniques are not effective with new era of big data, Internet of things (IoT) and 5G; as a result, handling effectively different big datasets becomes a vital task for operators with the continuous growth of data and moving from long term evolution (LTE) to 5G. So, there is an urgent need for effective Big data analytics to predict future demands, traffic, and network performance to full fill the requirements of the fifth generation of mobile network technology. In this paper, we introduce data science techniques using machine learning and deep learning algorithms: the autoregressive integrated moving average (ARIMA), Bayesian-based curve fitting, and recurrent neural network (RNN) are employed for a data-driven application to mobile network operators. The main framework included in models are identification parameters of each model, estimation, prediction, and final data-driven application of this prediction from business and network performance applications. These models are applied to Telecom Italia Big Data challenge call detail records (CDRs) datasets. The performance of these models is found out using a specific well-known evaluation criteria shows that ARIMA (machine learning-based model) is more accurate as a predictive model in such a dataset than the RNN (deep learning model).

Keywords : big data analytics, machine learning, CDRs, 5G

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