Data Analytics
Stiftung Universität Hildesheim
Marienburger Platz 22
31141 Hildesheim
Prof. Dr. Dr. Lars Schmidt-Thieme

Thesis
Unsupervised Real-Time Time-Series Anomaly Detection

Abdul Rehman Liaqat

271336, Liaqat@uni-hidesheim.de

Abstract

Anomaly detection is a crucial task for machine learning due to wide-spread usage and type. In particular, it is worth noting that most data arising in industrial setups are of a streaming nature, thus restricting the range of standard anomaly detection tools. This thesis will identify the potential approaches to learn the identification of abnormal behavior from large-scale streaming data. An empirical comparison of state-of-the-art methods will to be extended by a novel technical contribution. In this thesis, the focus is particularly on streaming time-series Anomaly Detection which changes in nature with time and novel contribution will especially try to target this dynamic nature of time-series.

Contents

1 Introduction

2 References

‘

[1] F. Chollet, “Xception: Deep learning with depthwise separable convolutions,” *CoRR*, vol. abs/1610.02357, 2016. [Online]. Available: http://arxiv.org/abs/1610.02357

[2] L. et. al. (2017) Author discussion. [Online]. Available: https://github.com/tensorflow/tensor2tensor/issues/9

[3] ——. (2017) Github Code github code. [Online]. Available: https://github.com/tensorflow/tensor2tensor/blob/f9c859a7639831c6da864e360793a285613dcc5c/tensor2tensor/models/multimodel.py

[4] L. Kaiser, A. N. Gomez, N. Shazeer, A. Vaswani, N. Parmar, L. Jones, and J. Uszkoreit, “One model to learn them all,” *CoRR*, vol. abs/1706.05137, 2017. [Online]. Available: http://arxiv.org/abs/1706.05137

[5] N. Shazeer, A. Mirhoseini, K. Maziarz, A. Davis, Q. V. Le, G. E. Hinton, and J. Dean, “Outrageously large neural networks: The sparsely-gated mixture-of-experts layer,” *CoRR*, vol. abs/1701.06538, 2017. [Online]. Available: http://arxiv.org/abs/1701.06538