

Analytics and AI for Industry- Specific Applications Minitrack

Sergey Belov
IBM

sergey_belov@ru.ibm.com

Andy Rindos
IBM

rindos@us.ibm.com

James C. Spohrer
IBM

spohrer@us.ibm.com

The purpose of this minitrack is to explore case studies of applications of data analytics and artificial intelligence based smart services and digital solutions across industries. We will discuss reports that improve our understanding of how analytics and AI are currently used across industries influencing digital transformation of economies. We are interested in getting answers to the question “Where can AI be applied in an industry specific manner (a task with open access data and code) to benchmark and to improve industry standard performance, and grow more opportunities for value creation?” We are also interested in open tech AI applications for manufacturing, agriculture, healthcare as well as for other industry-specific applications. We will emphasize research on the design, analysis, implementation, adoption, and evaluation of real-life cases that provide opportunities to design, develop, and deploy these capabilities as micro-services that solve customer needs, especially those with startup potential.

Opening presentation “Business Analytics for Sales Pipeline Management in the Software Industry: A Machine Learning Perspective” proposes a model designed to help sales representatives in the software industry manage the complex sales pipeline. By integrating business analytics in the form of machine learning into lead and opportunity management, data-driven qualification support reduces the high degree of arbitrariness caused by professional expertise and experiences. Through the case study of a software provider, authors developed three models to map the end-to-end sales pipeline process using real business data from the company’s CRM system. The results show a superiority of the CATBoost and Random Forest algorithm over other supervised classifiers such as Support Vector Machine and XGBoost. The study also reveals that the probability of either winning or losing a sales deal in the early lead stage is more difficult to predict than analyzing the lead and opportunity phases separately.

In the paper “FraudMemory: Explainable Memory-Enhanced Sequential Neural Networks for Financial Fraud Detection” authors propose a novel fraud detection algorithm. It adopts state-of-art

feature representation methods to better depict users and multimodal logs in financial systems. The proposed method uses a sequential model to capture the sequential patterns of each transaction and leverage memory networks to improve both the performance and interpretability. Also, with the incorporation of memory components, new algorithm called “FraudMemory” possesses high adaptability to the existence of concept drift.

The paper “Deep Learning for Improved Agricultural Risk Management” authors investigate potential of deep learning in predicting agricultural yield in time and space under weather/climate uncertainty. They evaluate the predictive power of deep learning, benchmarking its performance against more conventional approaches. The findings reveal that deep learning offers the highest predictive accuracy, outperforming all the other approaches. Authors infer that it also has great potential to reduce underwriting inefficiencies and insurance coverage costs associated with using more imprecise yield-based metrics of real risk exposure.

In the last paper “Holistic System-Analytics as an Alternative to Isolated Sensor Technology: A Condition Monitoring Use Case” authors propose a system-oriented concept of how to monitor individual components of a complex technical system without including additional sensor technology. By using already existing sensors from the environment combined with machine learning techniques, authors can infer the condition of a system component, without actually observing it. In consequence condition monitoring or additional services based on the component’s behavior can be developed without overcoming the challenges of sensor implementation.

We hope you will enjoy the papers and their presentation at the conference and we thank the authors for submitting excellent results of their work to make this minitrack successful.