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EDITORIAL

Editorial introduction

In *Deploying an Artificial Intelligence-Based Defect Finder for Manufacturing Quality Management*, Lee et al. explain how an academic-industry collaboration developed automation of the quality management process for Frontec, an SME company that manufactures automobile parts. The authors describe the practical results of embedding a convolutional neural network approach into the factory operations, including communication with the existing vision inspector.

Liu et al. in *Federated Learning-powered Visual Object Detection for Safety Monitoring* combine federated learning and computer vision, with application to safety monitoring solutions in smart city applications. The authors report deployment of their approach with multiple companies, including reducing communication overhead for one company by 50X and saving close to 40,000 RMB of network cost annually.

In *Optimizing Smart Grid Operations from the Demand Side*, Zheng and colleagues report on deploying an AI-empowered demand-side management decision support platform, called the Power Intelligent Decision Support platform, in Shandong Province, China. The system serves over 10,000 companies and reduced forced shutdowns from 16% to 0.56%.

Dalal and colleagues, in another application in the power grid, present a commercially-deployed machine learning system that automates the expected electricity grid loss 1 day in advance. *Day-ahead Forecasting of Losses in the Distribution Network* describes how the utility company Tensio thus reduced the mean average forecast percentage error by 40%, as well as reducing manual work.

In *Large Scale Multilingual Sticker Recommendation in Messaging Apps*, Laddha and colleagues from Hike Messenger address an e-commerce problem of recommending stickers in the Hike app, in the face of multiple languages and non-Roman alphabets. Their solution is in real-life use by millions of users in India.

In *Improving Search Engine Efficiency through Contextual Factor Selection*, Zeng and colleagues report on incorporating a Contextual Factor Selection (CFS) deep reinforcement learning approach into the Taobao e-commerce platform. This approach optimizes the selection of factors based on the context of each search query in order, to simultaneously maintaining search result quality while significantly reducing latency. Online deployment on Taobao.com demonstrated that CFS is able to reduce average search latency under everyday scenarios by more than 40% compared to the previous approach with comparable search result quality.

In *Clarity 2.0: Improved Assessment of Product Competitiveness from Online Content*, Huang and colleagues present Clarity, a data-driven unsupervised system for assessment of products. The authors explain the business case for this unique technology and discuss the impact of the deployed system used by over 4500 representatives in IBM.

How can the conversation of virtual assistant agents be improved? In *On the Care and Feeding of Virtual Assistants: Automating Conversation Review with AI*, Beaver and Mueen present Trace AI, a scalable system for automated conversation review based on the detection of conversational features that can identify potential miscommunications. Trace AI, in production for over 3 years, yields significant savings in human annotation costs.

Lastly, in *Feedback-Based Self-Learning In Large-Scale Conversational AI Agents*, Ponnusamy and colleagues from Amazon present, to their knowledge, the first self-learning large-scale conversational AI system in production. The system, deployed as part of Amazon's Alexa conversational agent, learns reformulations that reduce Alexa-user errors by pooling anonymized data across millions of customers.

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