Challenges & Opportunities in Advanced Alarm Management - an Academic Perspective

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In complex plants with thousands of sensors and actuators, alarms are the essential parts of the control system aiming to help the work of the operators by redirecting their attention towards critical plant conditions requiring timely assessment or action. However, faults in production systems generate alarm cascades that overload the operators and, in critical situations, makes the root cause analysis a challenging task for even the experienced operators. Moreover, malfunctions generate a significant spillover effect on the production plant, therefore, the prediction of the effect of a malfunction is a task of crucial importance as well. Our research group works on the development of advanced alarm management techniques inspired by the experts of the Danube Refinery of the MOL Group. In our presentation, we present how machine learning techniques like frequent sequence mining, process mining and deep learning can be applied for root cause analysis and the prediction of future events.

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