Moving Towards Autonomous Digital Twin: AI Powered ABMS for Optimal Sequential Decision Making

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Simulation modeling has allowed business intelligence leaders and operational research experts to go beyond traditional toolset (e.g. spreadsheets) and obtain more accurate models for complex and nonlinear business challenges. However, the process of creating such simulation models has remained cumbersome since all the business processes and their logic must be identified and hand coded in the modeling software. With the recent developments in the field of machine learning specifically reinforcement learning, we may be able to substantially reduce these efforts while maintaining the same benefits of conventional simulation modeling, possibly overcoming heuristics limitations with self-explored policy; thus, the union of machine learning field and simulation world can benefit both.
This presentation will be focused on an industrial problem, showing at first how it has been successfully addressed with agent-based modelling simulation.
Next, it will discuss reinforcement learning as an alternative to the implemented hand coded rule sets and shed light on the key steps, findings and challenges involved in developing a reinforcement learning powered simulation model.