

Grenoble mardi 5 et mercredi 6 février 2019

Cybersecurity in industry 4.0

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Mots clés : ISA95, B2MML Industry 4.0, Cybersecurity, IDS, IIoT

Résumé :

Our research works are focusing in intrusion detection system (IDS) in the industry of the future especially in Manufacturing Executive System (MES). We propose an intelligent IDS based on ISA95, B2MML and OPC UA standards. This IDS implement the MESA models and B2MML files exchange, then these models be executed thanks to Petri Net or a state machine to generate events.

These events will be the inputs of our IDS which raises an alert in case the order of transactions described by MESA standard is not respected. Our IDS uses ~~the~~ artificial intelligence techniques which consists in neural networks. For more credibility and efficiency, our neural network will be trained with a real dataset.

For more efficiency, this alert is correlated with the network traffic between MES and physical control level or between MES and ERP (Enterprise Resources Planning) to know if it is a real intrusion or a malfunction (voluntary or involuntary). Hence, our approach will be done in two steps, the first intrusions detection occurs using the events outcoming from the execution of the MESA models, and the second one occurs through network traffic between MES and systems control and/or between MES and ERP.