

Title: Departure-Based Intrusion Detection for Smart Industrial Environments

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Abstract

Advanced sensing is a key ingredient for intelligent control in smart industrial environments. Coupled with enhanced communication capabilities, the employed sensors are becoming increasingly vulnerable to cyberattacks, thereby jeopardizing the often safety-critical underlying infrastructure. To combat the growing threats on critical infrastructure, we propose PASAD, a novel model-free approach to detecting malicious operation in the underlying physical processes through real-time monitoring of sensor measurements. The proposed process-aware stealthy-attack detection mechanism processes raw sensor measurements to capture the dynamics of the cyber-physical system during a training phase, and then during a detection phase, it measures the extent to which current sensor observations conform with the estimated dynamics.