2017 NSF CYBER-PHYSICAL SYSTEMS PRINCIPAL INVESTIGATORS' MEETING

CPS: Synergy: Collaborative Research: Cyber-Physical Approaches to Advanced Manufacturing Security

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Challenge:

- Industry 4.0 is increasing the attack space for manufacturing systems
- Product design, performance, and/or overall quality can be targeted with attack
- Traditional quality control not designed for attack detection

Solution:

- Develop taxonomy of attacks to understand problem
- Build modeling tools to perform vulnerability assessment for manufacturing systems
- Creation of process monitoring techniques for attack detection

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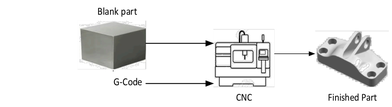
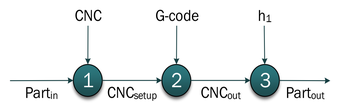
Manufacturing Security

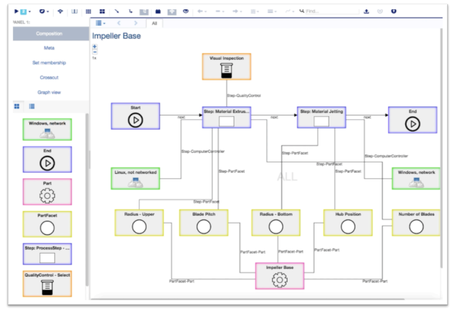
Assessment



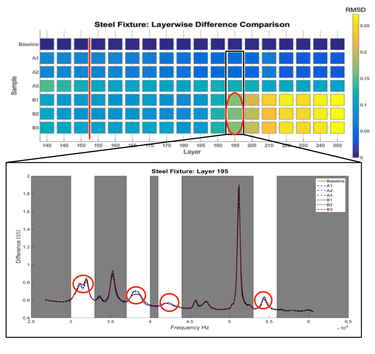


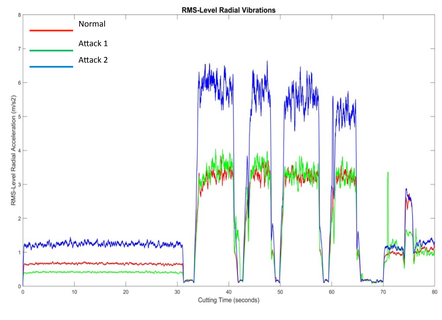
#	Description	Loss of information	Inconsistency	Relative Frequency	Lack of Maturity	Time until Detection
1	The CNC (CNC) is loaded with the raw material ($part_{in}$)	Low	Medium	High	Low	Low

Modeling



Attack Detection





Scientific Impact:

- Identification of cyber-physical vulnerabilities in manufacturing
- Modeling tool to inform decision making for interconnected MFG
- Novel side-channel detection in machining and AM

Broader Impact:

- Development of industrial standards incorporating CPS
- Cyber-Physical Security for Aerospace Manufacturing Workshop on next-generation cyber-physical security defense and quality control considerations
- Dissemination of CPS for manufacturing to various industry OEMs