FRAM-STPA model: case study of an industry 4.0 plant using a digital glove

Systemic methods in complex and digitalized manufacturing series

Date: February 8th, 2025
Time: 15:00 UTC
Duration: 60 mins

Brief summary of content:

This webinar is the third part of the Webinar Series: Systemic Methods in Complex and Digitalized Manufacturing, showcasing applied and analytical modeling research using FRAM and STAMP-STPA. The webinar is presented by members of the IEA Resilience Engineering Committee. The series focuses on applications in complex and digitalized manufacturing environments, including scenarios with complex manual work, digital gloves, smart glasses, and cobots.

The rapid advancement of Industry 4.0 increases interactions among humans, technologies, and organizations, resulting in greater complexity and new challenges. Traditional risk assessment methods may fail to identify all factors influencing system safety, necessitating innovative approaches. This study explores the use of the Functional Resonance Analysis Method (FRAM) and the Systems-Theoretic Accident Model and Processes (STAMP) in assembly 4.0 contexts to enhance occupational health and safety (OHS) and operational risk analysis. STAMP offers a detailed examination of system components, while FRAM provides a broader view of their interconnections. By integrating these two methods, the proposed FRAM/STAMP approach leverages their strengths to address their individual shortcomings. This novel framework aims to improve risk analysis in assembly 4.0 systems, particularly during the design phase, ensuring safer interactions between humans and machines in the workplace.

Early results:

Alimeh Mofidi Naeini, Sylvie Nadeau. 2023 Proposed integrated FRAM/STPA risk analysis of data gloves in assembly 4.0 system. Robotics and Computer-Integrated Manufacturing vol. 81

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Dr. Alimeh Mofidi holds a Doctor of Philosophy (Ph.D.) degree from École de technologie supérieure, where her research focused on occupational health and safety (OHS) and operational risks in Industry 4.0. She also earned a Master's degree in Business Administration (MBA) from K. N. Toosi University of Technology and a Bachelor's degree in Industrial Engineering from Isfahan University of Technology. In addition to her academic achievements, Dr. Mofidi has published research in Robotics and Computer-Integrated Manufacturing, CIRP Journal of Manufacturing Science and Technology, and African Journal of Business Management. She has served as a lecturer in both Iran and Canada. In her professional career, Dr. Mofidi is currently a Product Specialist and Project Manager at Siemens in Canada, with over two years of experience in project oversight and product specification management. She also brings nine years of expertise from her roles as a quality assurance expert/manager, production and project control expert/manager, and project risk evaluation expert in Iran's manufacturing industry.

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Registration
https://us02web.zoom.us/webinar/register/WN_eQaYNvSiRE24emm-FM4xeg

Registration is free to all interested people. The webinar will be recorded and published on YouTube. Registration permits live interaction with the presenters via Q&A.

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