COLLABS- A COmprehensive cyber-intelligence framework for resilient coLLABorative manufacturing Systems

Rapid advances in ICT are fostering a vision of future intelligent and autonomous manufacturing units. However, this vision is counterbalanced by an exponential increase in security risks and attack surfaces. To address such cybersecurity challenges, the EU-funded COLLABS project aims to develop, validate, demonstrate and support a comprehensive cyber intelligence framework for collaborative manufacturing. This framework will allow resilient, reliable and secure data exchange across the digital supply chain, and feature real-time response in threat prevention, detection and mitigation. Researchers will utilise state-of-the-art technologies and make significant scientific and technological advances in several key relevant domains. COLLABS' work will play a role in the realisation of industrial and societal opportunities with regard to collaborative manufacturing.

Industrial automation is expanding at an increasing pace, where this surge of innovation is driven by recent advances in information and communication technologies facilitating a "phase transition" towards "Industry 4.0". Coupling Industrial Internet of Things (IIoT) with Big Data analytics and Artificial Intelligence (AI) in industrial automation context is what will make industrial systems intelligent, enabling them to exchange information and operate remotely. However, the vision of future intelligent and autonomous manufacturing units is counterbalanced by exponential increase in security risks and attack surfaces that emerge as the production systems grow ever more connected. The manufacturing ecosystem lacks a thorough cyber intelligence solution that addresses the key IIoT-related cybersecurity challenges towards a full realization of collaborative manufacturing in the context of Industry 4.0.

COLLABS will develop, validate, demonstrate, and support a comprehensive cyber-intelligence framework for collaborative manufacturing, which enables secure data exchange across the digital supply chain while providing high degree of resilience, reliability, accountability and trustworthiness, and addressing threat prevention, detection, mitigation, and real-time response. COLLABS will achieve these goals by utilizing state-of-the-art technologies and making significant scientific and technological advances in several key relevant domains, including secure multi-party computation and homomorphic encryption, distributed deep learning and anomaly detection, distributed ledger technologies (blockchain) and smart contracts, and distributed remote software attestation. COLLABS will significantly contribute to realizing industrial and societal opportunities of collaborative manufacturing, by validating and demonstrating its framework on 3 real-world use cases coming from complementary Industry 4.0 manufacturing domains and delivering an Industry 4.0 Experimentation Lab.

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