

CYBER PHYSICAL SYSTEMS AND INDUSTRY 4.0: PERSPECTIVES AND FUTURE DIRECTIONS

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ABSTRACT

Advances in communication technology, computational modeling, and control algorithms have enabled the transformation of data into knowledge and control of machines and systems in real-time with high accuracy via smart sensory devices and wireless networks. Such systems are known as cyber-physical systems (CPS). Cyber-enabled Manufacturing (CeM) is a CPS that focuses on manufacturing machines and systems. As information technology becomes robust and mature, developed countries such as Germany are promoting the concept of Industry 4.0. The intent is to integrate designers, manufacturers, and consumers in a seamless way to increase productivity, reliability and customer satisfaction. This talk will describe key CPS, CeM and Industry 4.0 concepts. Existing work will be covered, including an ongoing project to build a CPS for thermal stress prevention in fused deposition modeling (FDM) based 3D printing processes and smart traffic light control system design. Potential research topics will be included as future directions.

Keywords: smart machine, mass customized automated assembly system, cyber-physical system, Industry 4.0



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