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PWEB 175

Enabling Intelligent Decision-Making in Manufacturing through Data-driven Methods

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Abstract: Future manufacturing envisions cyber manufacturing services that cater to on-demand production of discrete engineered products. These services are expected to be enabled by recent advances in digital manufacturing spanning the factory floor and the supply chain through Industry 4.0+ concepts and technologies. Critical to the realization of this vision are computational tools that enable intelligent and, where possible, automated decision-making. This talk will discuss the role of data-driven and, where possible, physics-driven computational tools in enabling automated decision-making at various stages of the design-to-manufacturing translation of discrete engineered products. Specifically, it will address the use of modern AI/ML and physics-based computational capabilities to automate key manufacturing decision-making including manufacturability assessment, process selection and sequencing, supplier selection, and other aspects of process planning with a focus on material removal and hybrid manufacturing processes.

Biographical Sketch: Shreyes Melkote holds a Morris M. Bryan, Jr. Professorship for Advanced Manufacturing Systems in Mechanical Engineering at Georgia Tech. He also serves as Executive Director of the Novelis Innovation Hub at Georgia Tech and Associate Director of the Georgia Tech Manufacturing Institute. His research spans many areas of manufacturing including precision machining, surface modification methods, hybrid manufacturing, industrial robotics, and application of AI/ML to solve complex decision-making problems in manufacturing. His honors include the 2024 ASME Milton C. Shaw Manufacturing Research Medal, the 2023 SME Gold Medal, and the ASME Blackall and Machine Tool Gage Award, among others. He has served as President of NAMRI/SME and as ASME Foundation Swanson Fellow at the Interagency Advanced Manufacturing National Program Office at NIST. He is a Fellow of ASME, SME, and CIRP.

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