KEYNOTE/PLENARY

Title:

Digital manufacturing - Advancing industrial productivity and resilience via digital twins, physical dependency-aware AI, and co-creation with the industry

Speaker:

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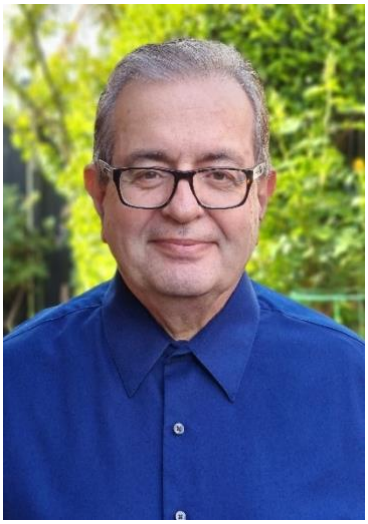
Abstract

Digital Manufacturing aims to make the industry more productive, resilient, and globally competitive than ever. To achieve this, we are co-creating with the industry advanced digital twins for effectively representing in the digital word complex physical entities in manufacturing, such as sophisticated industrial machines, materials and products, and people involved in production. To dramatically improve industrial productivity and resilience we devise physical dependency aware AI/ML models that help optimize production outcomes, e.g., by predicting production issues (such as inefficiencies, product inconsistencies, unplanned maintenance issues) and correct them before they occur. In this talk we also discuss ongoing development of a novel digital manufacturing platform that combines the above technologies and reduces the cost and effort of developing digital manufacturing solutions. We present examples of these technologies and related digital manufacturing solutions from over forty projects we have conducted jointly with industry partners in a variety of sectors ranging from food, steel, composites, to tools and vehicles. More importantly, we outline research directions, challenges, and opportunities for digital manufacturing that can transform the industry.

Biography



Dimitrios Georgakopoulos is the Director of the ARC Industrial Transformation Research Hub for Future Digital Manufacturing (digitalmanufacturing.com.au) and Computer Science Professor at Swinburne University of Technology in Melbourne, Australia. Before that he served as Research Director at CSIRO's ICT Centre (where he led Australia's largest Computer Science/Computing research program), and as Professor at RMIT University. Earlier, Dimitrios held senior research and management positions in major industrial laboratories in the USA, including Telcordia Technologies (currently Ericsson USA); Microelectronics and Computer Corporation (MCC); GTE Laboratories (currently Verizon); and Bell Communications Research (Bellcore). Dimitrios has authored 325 articles in IoT, AI, process automation, and data management that have received approximately 25,000 citations. His research in these areas has been awarded with $77M of external research grants/contracts. According to Elsevier's science-wide author databases of standardized citation indicators, he is in the 2% of the top-cited authors globally (top 1% if self-citations are excluded) in both career and 2025 rankings. In addition, Dimitrios has led several major multi-organizational and cross-disciplinary research initiatives in social services, digital agriculture, water management, and defense that received over $100M of research funding from the Australian and USA governments. Dimitrios has received 18 awards that include, the 2023 National iAward for Government & Public Sector Solution of Year from the Australian Information Industry Association's, several best paper awards from CORE A*/A flagship conferences, the 2018 Vice-Chancelor's Research award, and three industry awards that include the 2013 Black Duck Open Source Rookie of the Year Award.