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Role of AI and Data Science in Chemical and Materials Manufacturing and Research

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Zoom

Abstract

Artificial intelligence and machine learning are revolutionizing the approach to chemical and materials manufacturing and research. Chemicals and materials impact daily life, including enabling modern healthcare, preservation of food, delivering performance and efficiency of transportation and infrastructure, and other sustainable applications.

This talk will focus on the use of these tools, and more broadly data science, in R&D, manufacturing, and supply chain in the chemicals industry. The opportunities and forward challenges in the space will be discussed.

Host

David Janes, Tillman Kubis, and Santokh Badesha

Speaker Bio

Dave Parrillo is currently the Vice President of Research and Development (R&D) for Dow's Packaging & Specialty Plastics division. This $28 billion revenue division is key to Dow's decarbonize and grow strategy and includes Dow's Hydrocarbons & Energy business.

Dave joined Dow in 2007 and developed new business strategies for several business platforms for Dow's Technology Licensing & Catalyst Business. In 2008, Dave became the Sr. R&D Director for Ventures & Business Development and worked to evolve Dow's strategy in the lithium-ion battery market, leading to the formation of the Dow Kokam Joint Venture. In 2009, Dave became the Global Director for Dow Solar Solutions R&D. He assembled the team and created the reliability engineering strategy, which led to a UL certified, residential solar building product, and the commercial launch of the Dow POWERHOUSE™ Solar Shingle. The Dow POWERHOUSE™ team received numerous awards, for example: The 2010 Environmental Excellence in Emerging Technology, and the 2012 Edison Award for Global Best New Product. Dave championed several innovative Dow venture capital investments within the solar space leading to Dow's acquisition of a select company.

In 2012, Dave joined Dow's Packaging & Specialty Plastics business managing R&D/TS&D. He led the team for six years to innovate with product launches focused on providing business value and driving sustainable solutions across the value chain: Agility™ Performance LDPE resins, Symbiex™ ultra-fast curing solvent-less packaging adhesives, INNATE™ precision packaging polyethylene resins, Recycle Ready™ Stand Up Pouch technology, and INNATE™ Tenter Frame Biaxially Oriented Polyethylene (TF-BOPE) resin. These innovations received numerous awards, including: 2015-2017 R&D 100 Awards, the 2015 German Packaging Award, and the 2015 the Ringier Technology Innovation Award.

In 2018, Dave joined Industrial Intermediates and Infrastructure (II&I) managing R&D for the Dow businesses of Polyurethanes, Construction Chemicals, Oil and Gas, and Industrial Solutions. The II&I division generates approximately $13 Billion in sales and provides solutions in the areas of: Consumer Comfort, Energy Efficiency, Oil & Gas Processing, Transportation, and Infrastructure. During Dave's leadership of II&I R&D, the team's new products have received numerous awards such as: The 2021 the Business Intelligence Award for The World's First Commercial Polyurethane-Carbon Fiber Spar Cap for a New Generation of Wind Blades, The 2021 FUTUREDGE50 Award for Predictive Intelligence, an Artificial Intelligence Chemical Formulation Capability, The 2020 Best Sustainable Product for its RENUVA™ Mattress Recycling Program in Chemical Week's Sustainability Awards, and The 2018 R&D 100 Award for the ECOFAST™ Pure Sustainable Textile Treatment.

In 2022, Dave joined Dow's Core R&D and led a robust portfolio responsible for all of Dow's R&D University hiring, university and research partnerships, and long-term R&D growth investments. Dave led the team to create 1) dual domain digital + STEM skills intern program serving all Dow functions and 2) DAISE, a data analytics immersion experience for underrepresented minority STEM students.

Previously, Dave held positions at General Electric and Air Products and Chemicals.

Dave holds a Ph.D. in Chemical Engineering from the University of Pennsylvania and a B.S. in Chemical Engineering from the University of Rhode Island. He has held leadership positions in several organizations: the board of the NuvoSun company, the board (and treasurer) of the Materials Research Society, and The Leadership Council of Manufacturing Foresight. He currently holds board positions, including: External Advisory Board UC Santa Barbara for Chemical Engineering, Board of the West Midland Family Center, Board (and Treasurer) of Cancer Services of Midland, and The Advisory Board of AIChE's Institute for Learning and Innovation.

He holds fifteen U.S. patents, has authored/coauthored twenty publications in the scientific literature, been elected to the National Academy of Engineering, and is the recipient of numerous awards, including the Whitney Technical Achievement Award.