RESOURCES FOR INDUSTRY

Connected Systems Institute (CSI) uwm.edu/csi/

UWM Center of Excellence develops manufacturing domain specialists through education, state-of-the-art lab facilities and collaborative research opportunities:

- *Accelerating innovation by bringing together industry and academic researchers*
- *Facilitating digital transformation for small and medium-sized manufacturers*
- *Developing an educational curriculum to better prepare the workforce of the future*

Advanced Analysis Facility (AAF) uwm.edu/aaf/

Ben Church, Director, *church@uwm.edu*

User-based research instrumentation facility that providing an alternative to private analysis laboratories for industry use, fostering collaboration with students and faculty.

Industrial Assessment Center (UWM IAC)

uwm.edu/ceas-iac/

Ryo Amano, Director, *amano@uwm.edu*

Helping manufacturers and utilities to increase their productivity and competitiveness by reducing energy and water consumption, enhancing cybersecurity, and adopting smart manufacturing technology with free assessments.

KEY PARTNERS

Partner with us:

Andrew J. Graettinger, Associate Dean for Research,
andrewjg@uwm.edu 414-229-7389

ADVANCED MANUFACTURING RESEARCH EXPERTISE

OVERVIEW

Our Industry 4.0 research builds on Milwaukee's long history of innovation and leadership in manufacturing, to create the factories of the future for Wisconsin and the world, from the manufacturing floor through the cloud to a highly skilled workforce.

RESEARCH HIGHLIGHTS

Moving small and medium sized manufacturing into the era of Industry 4.0:

- Digital twin manufacturing
- Robotic controls
- Virtual reality training
- Embedded systems
- Enhanced cyber security

Leveraging big data

- Protecting infrastructure from threats including cyber attacks

Improving supply chains

- Sustainable and resilient supply chain management
- Developing a mathematical model that quantifies the role panic plays in supply chain

EXPERT FACULTY AND FACILITIES

Predictive Data Analytics and Sustainable Manufacturing

Wilkistar Otieno, Associate Professor, Industrial & Manufacturing Engineering, otieno@uwm.edu

- *Remanufacturing*
- *Energy sustainability*
- *Reliability analysis of products and systems*

AI-Empowered Internet-of-Things

Shuaiqi Shen, Assistant Professor, Electrical Engineering, shen8@uwm.edu

- *Edge intelligence*
- *Energy-efficient embedded systems*
- *Internet-of-Things security*
- *Next-generation wireless networks*

Advanced Human-Machine Interactions with Immersive Technologies

Jerald Thomas, Assistant Professor, Computer Science, jeraldt@uwm.edu

- *Immersive collaboration*
- *Natural locomotion in virtual environments*
- *Mixed-reality, augmented reality and virtual reality*

Human Robotic Interaction

Habib Rahman, Richard and Joanne Grigg Associate Professor, Mechanical Engineering & Computer Science, rahmanmh@uwm.edu

- *Artificial intelligence, neural networks and fuzzy systems*
- *Collaborative and mobile robots*
- *Digital twin modeling*
- *Intelligent systems, adaptive, and nonlinear control*

Sensor Systems

Nathan Salowitz, Richard and Joanne Grigg Associate Professor, Mechanical Engineering, salowitz@uwm.edu

- *Inform the Industrial Internet of Things*
- *Reduce data, simplify analysis, minimize cost*
- *Operate in unique and extreme environments*

Sustainable and Resilient Supply Chain Management

Dah-Chuan Gong, Scientist, Industrial & Manufacturing Engineering, gongd@uwm.edu

- *Logistics and warehousing system*
- *Applied operations research*
- *Production-inventory systems analysis*

Model-Based Systems Engineering

Satya Aditya Akundi, Assistant Professor, Industrial & Manufacturing Engineering, akundivy@uwm.edu

- Complex systems engineering
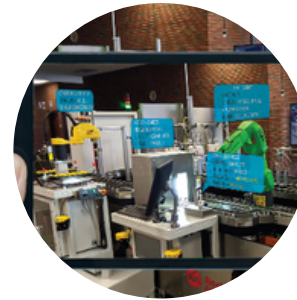- Cyber physical systems

Microstructure-Based Modeling

Bill Musinski, Assistant Professor, Mechanical Engineering & Materials Science & Engineering, musinski@uwm.edu

- *Additive manufacturing*
- *Fatigue*
- *Micromechanics*

Cyber Security

Zhen Zeng, Assistant Professor, Computer Science, zhenzeng@uwm.edu

- *AI for cybersecurity*
- *Cloud security*
- *Network security*

Digital Twin Modeling

Ilya Avdeev, Associate Professor, Mechanical Engineering, avdeev@uwm.edu

- *Design of energy storage systems*
- *Digital twin real-time and reduced-order modeling*

Improving Profit and Social Welfare

Jaejin Jang, Associate Professor and Chair, Industrial & Manufacturing Engineering, jang@uwm.edu

- *Improved efficiencies in production and service*
- *Design and control of production systems*
- *Management of natural resources for maximum social welfare and environmental protection*
- *Supply chain under natural disasters*

Discrete Event Simulation

Matthew Petering, Associate Professor, Industrial & Manufacturing Engineering, mattpete@uwm.edu

- *Math programming*
- *Logistics*
- *Transportation*
- *Ocean and rail container shipping*
- *Material handling systems*
- *Supply chain management*

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UWM College of Engineering & Applied Science