

**Dr. Zheng-Dong Ma**, Research Scientist Emeritus in **Mechanical Engineering** at the **University of Michigan**, is a recognized pioneer in **computational mechanics**. With over four decades of experience, his work spans **structural dynamics, multibody system dynamics, coupled structural-acoustic systems, topology optimization, isogeometric analysis, multiscale analysis, and architected cellular metamaterials**.

Dr. Ma's work focuses on groundbreaking innovations in **structural and material concepts** for military and commercial applications. His research has resulted in three patented architected cellular metamaterials: **Advanced Composite Armor, Biomimetic Tendon Reinforced (BTR) Composite**, and **Three-Dimensional Auxetic (NPR) Material**. Leveraging these advancements, he developed an innovative **non-pneumatic tire**, tailored for urban and off-road environments.

In addition to his materials research, Dr. Ma has advanced **computational methods and numerical algorithms** for the modeling, simulation, and design of next-generation structures and materials. His contributions include **Topology Optimization for Vibrating Structures (TOVS), Function-Oriented Material Design (FOMD), Modularized Product Digitization (MPD)**—encompassing **Digital Twin** technology (**Digital n-Wheel**)—**Advanced Isogeometric Analysis (IGA), Multiscale Analysis (MSA)** and **Distributed Simulation and Design (D-Sim)**.

As the **Founder and Owner** of **N-Wheel Technologies, Inc.**, Dr. Ma is now dedicated to creating innovative technologies for modeling, simulating, designing, and manufacturing advanced structural and material systems, with a focus on **non-pneumatic tire and wheel**, named **metaTire and n-Wheel** respectively.

Dr. Ma has authored or co-authored more than **180 peer-reviewed research papers** and has directed numerous projects for the **U.S. Army, Marine Corps, Air Force**, and leading industries in **automotive** and **aerospace**. His work has garnered prestigious accolades, including best paper awards from **ASME, SAE, JSME**, and other leading organizations. In 2005, he received the **Outstanding Research Scientist Award** from the **University of Michigan College of Engineering**, and in 2008, he was named a **Fellow of the American Society of Mechanical Engineers (ASME)**.

Dr. Ma completed his **Ph.D. in Mechanical Engineering** at **Kyoto University, Japan**, in 1989 and joined the University of Michigan as a faculty member in 1991. Dr. Ma's legacy of innovation and research continues to shape the future of structural and material engineering, driving transformative solutions for modern industry.