

Keynote: Machine-Learning based Computational mechanics as a powerful tool for engineering and science

Keynote Speaker: Prof. YuanTong Gu, Queensland University of Technology, Australia

Abstract: In recent years, a new paradigm of Machine-Learning based or data-driven computational mechanics is proposed and has been attracting increased research effort. This talk reports recent research in the speaker's group for machine-learning-based computational mechanics. It has proven that, with the aid of the Machine-Learning techniques, computational mechanics is a powerful tool for engineering and science. The challenges and future directions of computational mechanics are also discussed.

Professor YuanTong Gu is Head of School of Mechanical, Medical and Process Engineering at Queensland University of Technology (QUT), and Director of Australian ARC Industrial Transformation Training—Joint Biomechanics. He was a prestigious Australian Research Council (ARC) Future Fellow. Prof Gu is a world-renowned expert in computational mechanics and mechanical engineering. Prof Gu's research interests include Computational mechanics, Mechanical engineering, Biomechanics, Multiscale modelling, Nanomechanics, and Energy and environment engineering. He has secured more \$20M research fund in relevant fields. He authored more than 350 refereed journal publications and one popular book. Most of his publications are in highly ranked journals including *Nature Communications*, *Advanced Functional Materials*, *Nano Letters*, *International Journal for Numerical Methods in Engineering*, and *Computational Mechanics*. His publications have been attracted more than 12K citations in Google Scholar. He was Editor-in-Chief for Australian Journal of Mechanical Engineering, and is Associate Editor for two prestigious international journals, and an Editorial Board Member for other five journals. He is now an Executive Committee Member of Australian Association on Computational Mechanics and International Association of Applied Mechanics. Prof Gu has obtained several awards and prizes in the mechanics including The International Computational Methods Award and The ICACM Computational Mechanics Award. He has been invited to give more than 30 plenary and invited talks in international conferences. He served as the conference chair for two international conferences, and will organize The 9th Asian Pacific Congress on Computational Mechanic in 2025.

