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7 AM CALIFORNIA, 10 AM BOSTON

3 PM LONDON, 10 PM BEIJING

# EML WEBINAR



## YONGGANG HUANG

NORTHWESTERN UNIVERSITY

### RELATION BETWEEN BLOOD PRESSURE AND PULSE WAVE VELOCITY

Hypertension is the most important risk factor for premature death worldwide. Continuous monitoring of blood pressure (BP), an essential measure of hypertension, typically uses cuff-based or invasive techniques, which are discomfort and inconvenient. The continuous, cuffless and noninvasive BP monitoring, via the pulse wave velocity (PWV), is a promising technique to overcome these drawbacks.

However, the relations between the BP and PWV reported in the literature are empirical, involving unrealistic assumptions that do not hold for human arteries. Recently, a mechanics model without such assumptions is established to yield an accurate relation between BP and PWV. For human arteries, such a BP~PWV relation is greatly simplified to a quadratic function, which is validated by literature data as well as by new experiments on human subjects. It establishes the foundation for determining the BP from the PWV in continuous, cuffless, and noninvasive blood pressure monitoring.

**Professor Yonggang Huang** is the Walter P. Murphy Professor of Mechanical Engineering, Civil and Environmental Engineering, and Materials Science and Engineering at Northwestern University. He is interested in mechanics of stretchable and flexible electronics, and mechanically guided deterministic 3D assembly. He has published >600 journal papers, including 10 in Science and 5 in Nature. He is a member of the US National Academy of Engineering, US National Academy of Sciences, a fellow of American Academy of Arts and Sciences, and a foreign member of European Academy of Sciences and Arts, Academia Europaea, and Chinese Academy of Sciences. His research awards in the past 7 years include the Drucker Medal (2013), Nadai Medal (2016), and Thurston Lecture Award (2019) from the American Society of Mechanical Engineers; Prager Medal (2017) from the Society of Engineering Sciences; and Bazant Medal (2018) and von Karman Medal (2019) from the American Society of Civil Engineers.

Host: Professor Vicky Nguyen, Johns Hopkins University

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