



## **MECHANICAL ENGINEERING SEMINAR**

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Online: https://technion.zoom.us/j/92745040091

## **Turbulence Estimation: Model-Based to Machine Learning**

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## Hosted by: Prof. Pinhas Bar-Yoseph

Turbulent flows are ubiquitous in both natural and engineering systems, characterized by fluctuations that span a wide range of scales. The complex nature of these fluctuations presents a significant challenge in accurately estimating turbulence. In my research, I delve into the application of modelbased methods, specifically those based on stability and resolvent analysis, to estimate turbulent flows within wind and tidal farms. Furthermore, I have been exploring data-driven methods for turbulence estimation, including data assimilation techniques and model-free neural networks. These data-driven approaches provide alternative pathways for estimating turbulent flows, capitalising on recent advancements in measurement techniques and computational power. My recent endeavours have focused on comprehending the capabilities and limitations of different methods for turbulence estimation under various measurement conditions. This research holds the promise of providing guidance in selecting the optimal method and measurement strategy for turbulence estimation.