

Inverse problems in fluid dynamics: methods and applications

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In this talk we present different inverse problems in fluid dynamics, ranging from the reconstruction of pressure fields from experimental data to estimating the topography of the ocean floor from surface measurements. We compare traditional numerical method-based techniques such as nudging and adjoint methods, as well as neural network-based ones, such as physics-informed neural networks and generative adversarial networks. We show how reconstruction problems not only have practical applications but can also be used as a tool to probe for the most relevant structures and degrees of freedom in a fluid flow.

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