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Opportunities for Machine Learning in Fluid Mechanics[1]

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There are tremendous opportunities to use recent advances in machine learning and artificial intelligence to advance fluid mechanics as a discipline. This talk will give an overview of these opportunities, including (i) making scientific discoveries, such as the discovery novel flow phenomena; (ii) defining new representation of dynamical flows that make numerical solvers more efficient; (iii) the design of novel methods for experimental imaging and characterization; and (iv) development of novel coarse grained solvers for the Navier Stokes equations. I will summarize the advances in Machine Learning that have made these opportunities possible and include some recent examples from our own work.