**CRUNCH Seminars at Brown, Division of Applied Mathematics**

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# Fourier Neural Operator for Parametric Partial Differential Equations

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**In this talk I will introduce our recent works Neural Operator. The classical development of neural networks has primarily focused on learning mappings between finite-dimensional Euclidean spaces. Recently, this has been generalized to neural operators that learn mappings between function spaces. For partial differential equations (PDEs), neural operators directly learn the mapping from any functional parametric dependence to the solution. Thus, they learn an entire family of PDEs, in contrast to classical methods which solve one instance of the equation. We formulate a new neural operator by parameterizing the integral kernel directly in Fourier space, allowing for an expressive and efficient architecture. We will demonstrate the experiments on Burgers' equation, Darcy flow, and the Navier-Stokes equation (including the turbulent regime).**