**Discovery of Partial Differential Equations Using Deep Convolutional Networks**

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Partial Differential Equations (PDEs) are used to translate natural phenomena related to

heat transfer, diffusion, elasticity or fluid dynamics to physical law. The language of translation is mathematics. Till now, PDEs are derived based on physical laws and empirical observations and are solved manually with the aid of computational tools. With an increasing number of complex systems and dynamics being observed, manually PDEs discovery would be less practical and is beyond human intelligence. To this end, we are shifting to find a statistical approach that automatically discovers the governing equations from experiments and simulations. Inspired by the latest work of data-driven discovery of the physical laws, we proposed an approach applying a deep neural network, which combines Convolutional Neural Network (CNN) and Long Short-Term Memory (LSTM), to discover PDEs from a vast amount of simulation data. This method can be used to discover PDEs from videos which has many applications in biological and chemical sciences.