SC15-009: Recent Advances in Physics-Informed Deep Learning

Instructors:

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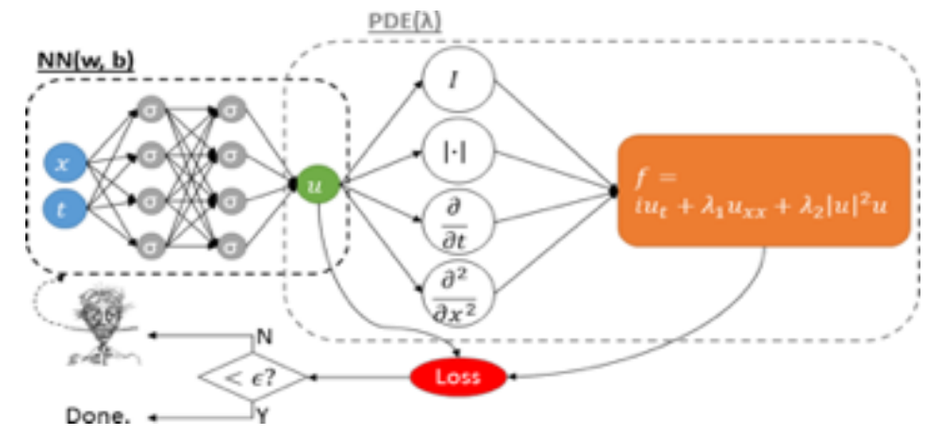
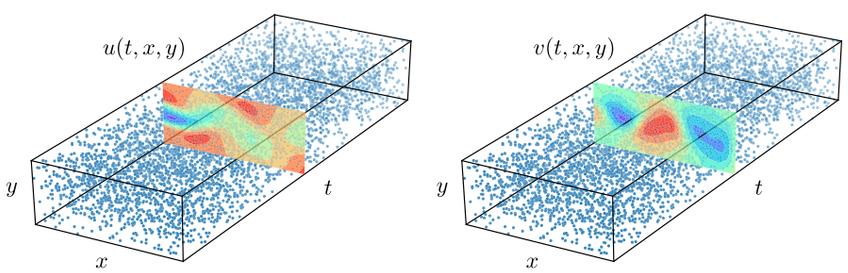
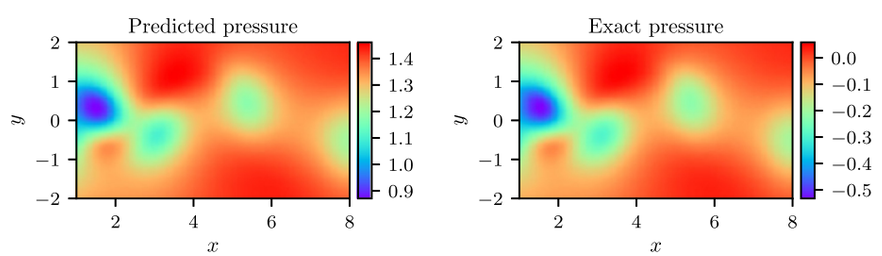
- Maziar Raissi (NVIDIA, maziar.raissi@gmail.com)







Correct PDE	$u_t + (uu_x + vu_y) = -p_x + 0.01(u_{xx} + u_{yy})$ $v_t + (uv_x + vv_y) = -p_y + 0.01(v_{xx} + v_{yy})$
Identified PDE (clean data)	$u_t + 0.999(uu_x + vu_y) = -p_x + 0.01047(u_{xx} + u_{yy})$ $v_t + 0.999(uv_x + vv_y) = -p_y + 0.01047(v_{xx} + v_{yy})$
Identified PDE (1% noise)	$u_t + 0.998(uu_x + vu_y) = -p_x + 0.01057(u_{xx} + u_{yy})$ $v_t + 0.998(uv_x + vv_y) = -p_y + 0.01057(v_{xx} + v_{yy})$

Schedule (Room 205)

Time	Lecturer	Topic
8.30-9.20am	Paris Perdikaris	Supervised learning with neural networks in Tensorflow
9.20-10.10am	Maziar Raissi	Physics-informed neural networks (Part I)
10.10-10.30am	Coffee Break	
10.30-11.20am	Paris Perdikaris	Physics-informed neural networks (Part II)
11.20-12.10pm	Maziar Raissi	Multi-step neural networks
12.10-1.00pm	Lunch Break	
1.00-1.50pm	Paris Perdikaris	PINNs on Graphs
1.50-2.20pm	Maziar Raissi	Hidden physics models
2.20-3.10pm	Paris Perdikaris	Physics-informed deep generative models
3.10-3.30pm	Coffee Break	
3.30-4.20pm	Maziar	Forward Backward Stochastic Neural Networks
4.20-5.10pm	Paris Perdikaris	Open challenges
5.10-5.30pm	Maziar Raissi	Summary and future work