

Deep Learning for PDEs

Jaime López García

Repsol

Review of the principal research directions regarding the application of Deep Learning algorithms to the solution of partial differential equations. The subject will be presented from a practical standpoint. The implementation and code to run the examples will be shared and properly explained. The main libraries used will be FeniCS and Pytorch.

Two popular approaches will be discussed:

A supervised-learning approach, using the networks as surrogate models that learn a parametrized operator from a set of simulations.

An optimization/unsupervised-learning approach. Reformulating the problem as a variational problem, whose extrema are expected to be close to the solution of the original partial differential equation.

Main references:

<https://arxiv.org/abs/2008.09768>

<https://arxiv.org/abs/2010.08895>

<https://www.sciencedirect.com/science/article/pii/S0021999118307125>

Data: 7 de Maio de 2021.

Lugar: Online a través de MS Teams. Tódalas persoas interesadas en asistir poden inscribirse antes das 14:00h do 4 de Maio a través do formulario online:

https://forms.office.com/Pages/ResponsePage.aspx?id=LEUNj6S3ZEm4Elw5c3RH_ex0UBj79pONLinyypeuUzaRdUMkVMSDBLMzRLSFdQVzdTTkMxM1BKTENRUS4u

Duración: 1 hora (aproximadamente).

Hora: 12:00h.