



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

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Seismic Tomography, Image Segmentation and Deep Learning

THURSDAY, February 20, 2020, at 4:00 PM
Jones 226, 5747 South Ellis Avenue

ABSTRACT

Seismic tomography is a scientific field using realistic earthquake data to analyze the inner structure of our Earth. In this talk, we present a natural connection of three-dimensional seismic tomography to image segmentation problems, which we solve efficiently using deep neural networks with a UNet architecture. It is challenging to obtain sufficient valid data to train neural networks, and we overcome it by developing a fast synthetic data generator using multi-scale asymptotic analysis. The accuracy and parallelizability of the proposed algorithm is illustrated by comparing to the spectral element method. Moreover, the developed multi-scale algorithm can be also used to accelerate various standard applications in seismic tomography, including seismic traveltime tomography and full waveform inversion

Organizer:

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