SCIENTIFIC DEEP LEARNING

Tan Bui-Thanh[1]

[1]*The University of Texas at Austin*

MINISYMPOSIUM

The fast growth in practical applications of deep learning in a range of contexts has fueled a renewed interest in deep learning methods over recent years. Subsequently, scientific deep learning is an emerging discipline that merges scientific computing and deep learning. Whilst scientific computing focuses on large-scale models that are derived from scientific laws describing physical phenomena, deep learning focuses on developing data-driven models which require minimal knowledge and prior assumptions. With the contrast between these two approaches follows different advantages: scientific models are effective at extrapolation and can be fitted with small data and few parameters whereas deep learning models require a significant amount of data and a large number of parameters but are not biased by the validity of prior assumptions. Scientific deep learning endeavors to combine the two disciplines in order to develop models that retain the advantages from their respective disciplines. This mini-symposium collects recent works on scientific deep learning methods covering theories and algorithms for both forward and inverse problems with applications in engineering, sciences, and scientific computing.