

ARE NEURAL OPERATORS REALLY NEURAL OPERATORS?

Rima Alaifari

ETH Zurich, Switzerland

rimaa@ethz.ch

In operator learning, it has been observed that proposed models may not behave as operators when implemented on a computer, questioning the very essence of what operator learning should be. We contend that some form of continuous-discrete equivalence is necessary for an architecture to genuinely learn the underlying operator, rather than just discretizations of it. Employing frames, we introduce the framework of Representation equivalent Neural Operator (ReNO) to ensure operations at the continuous and discrete level are equivalent.

Joint work with Francesca Bartolucci (TU Delft), Emmanuel de Bezenac (ETH Zurich), Bogdan Raonic (ETH Zurich), Roberto Molinaro (ETH Zurich), Siddhartha Mishra (ETH Zurich).