

COMBINING MACHINE LEARNING AND STOCHASTIC METHODS FOR MODELING AND FORECASTING COMPLEX SYSTEMS

Georg Gottwald

University of Sydney, Australia
georg.gottwald@sydney.edu.au

Random feature maps can be viewed as a single hidden layer network in which the weights of the hidden layer are fixed and only those of the outer layer are learned. We show that random feature maps allow for sequential learning when combined with an ensemble Kalman filter, leading to improved forecasts when compared to standard random feature map learning. The method can be extended to the case of noisy partial observations. Random feature maps, we show, can further be used to learn subgridscale parametrizations from noisy data as well as produce reliable ensembles.

Joint work with Sebastian Reich (Universität Potsdam).