CODES
Seminar

Random feature expansions guided by input weighting

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Abstract: Random feature expansions (RFEs) approximate functions by as an expansion of random selections of basis functions from a specific class. The approach emerged from both neural networks and from random feature approximations to kernel matrices. Popular formulations like random Fourier expansions connect these two areas. Recent work advocates using RFEs, as surrogate models to emulate multivariable functions, for applications in uncertainty quantification. In this talk, we put forth an advancement in RFE-based surrogate modeling. Our proposed algorithm learns underlying input interaction structure in the target model and builds this into the RFE surrogate. We give insight into the method via theoretical underpinnings–reproducing kernels, feature maps, and decompositions of multivariable functions–and by presenting its performance in numerical experiments

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