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Designing Chemistry to Engineer Multiscale Materials Behavior

Ultimately, the performance of material in an engineering system is dependent of the complex interaction between the basic chemistry used for synthesis with the impact on processing, microstructure and defects. Despite decades of work we have, as of yet, no unified mathematical formalism for harnessing this heuristic knowledge into first principles modeling and thus more rapidly target our next potential discovery of a new material. In this talk we show different data driven approaches in harnessing statistical learning methods to identify new materials.