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There has been much interest in nonlocal models associated with a horizon parameter δ which characterizes the effective range of nonlocal interactions. Asymptotically compatible discretization provides a framework to develop robust numerical discretization schemes that are insensitive to changes in the parameter δ . We discuss the progress on the design and mathematical analysis of such discretization for nonlocal variational problems and nonlocal conservation laws.

Joint work with Xiaochuan Tian (UCSD), Kuang Huang (Columbia University), and other collaborators.