
Hari Sundar
**Challenges in Parallelizing Adaptive High-order
Geometric Multigrid**

School of Computing
University of Utah
50 S Central Campus Dr
Room 3190
Salt Lake City
UT 84112
`hari@cs.utah.edu`

Our goal is to develop multigrid solvers for extreme-scale geoscience problems on exascale machines. This necessitates the need for high-order, adaptive discretizations as well as a parallel, matrix-free implementation. The combination of these characteristics presents several challenges for geometric multigrid. These issues are related to the designing and implementing efficient smoothers as well as restriction and prolongation operators. Efficient solutions exist or are trivial when any one of these features—high order, adaptive, matrix-free—is not required. I will present these challenges and some solutions for overcoming these problems.