APPLIED MATHEMATICS COLLOQUIUM:
Simulating at the Extreme: Making Every Bit Count

Jeffrey A. F. Hittinger
Director, Center for Applied Scientific Computing
Lawrence Livermore National Laboratory

Date:
10/30/2020

Time:
3:00 PM – 4:20 PM

Link:
Please email snsgradstaff@ucmerced.edu for Zoom link and passcode.

About The Speaker:

Dr. Jeffrey Hittinger is a computational scientist at Lawrence Livermore National Laboratory (LLNL), where he works on the development and application of advanced discretization methods for partial differential equations underlying multiphysics numerical simulations. He is currently the Director of LLNL's Center for Applied Scientific Computing (CASC), the nexus of research in computational mathematics, computer science, and data science in the Computation Directorate. Over his 20-year career at LLNL, Dr. Hittinger has worked on applications in plasma physics, fluid dynamics, and radiation hydrodynamics, devising high-order finite-difference and finite-volume methods, parallel computing strategies, and adaptive mesh refinement techniques. He has also made advancements in a posteriori error estimation and finite precision floating-point representations, recently leading a Laboratory Strategic Initiative on Variable Precision Computing. Dr. Hittinger was very involved in the DOE's exascale computing planning, culminating with his role as co-chair for the working group responsible for the DOE ASCR's Applied Mathematics Research for Exascale Computing report.

Abstract:

We increasingly rely on simulations of complex physical phenomena for insight, to design, and to make decisions. These types of calculations are expensive and often are not limited by the speed of the processors but by the speed of data transfer and the amount of available memory per core. Typically, much of this data storage and transfer of floating-point numbers is wasteful, as it contains much less information than the number of bits would suggest. In this talk, we will explore new approaches to floating point data representation, including the use of lossy compressed arrays as a new data-efficient format.

For more information, contact : Chrysoula Tsogka
ctsogka@ucmerced.edu