Towards real-time monitoring, optimization, navigation and analysis for tomography experiments

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As the sophistication of today's experiments grow at synchrotron light sources, collecting the most informative data has become greatly relevant, necessitating the development of methods and techniques that can provide good quality reconstructions from big data streams. Overcoming these challenges commonly requires developing real-time data streaming systems, and complex analysis workflows for automating the process. In this talk, I will first give a broad overview of the status of imaging applications, and then describe how existing methods can be adopted to enable faster and reliable information extraction from measurements. I will also highlight the need for an integration of hardware and software in building successful instruments of the future, especially after realization of the next-generation of x-ray sources providing orders of increased brilliance and coherence.

Doga Gursoy is a computational scientist at the Argonne National Laboratory. His research focus has been primarily on the modeling and algorithmic aspects of computational imaging and inverse problems. He has a broad interest in modeling of forward and inverse photon transport processes and numerical methods for solving large-scale parameter estimation problems.