Machine Learning as Applied to Nondestructive Characterization

Data Science Institute Workshop

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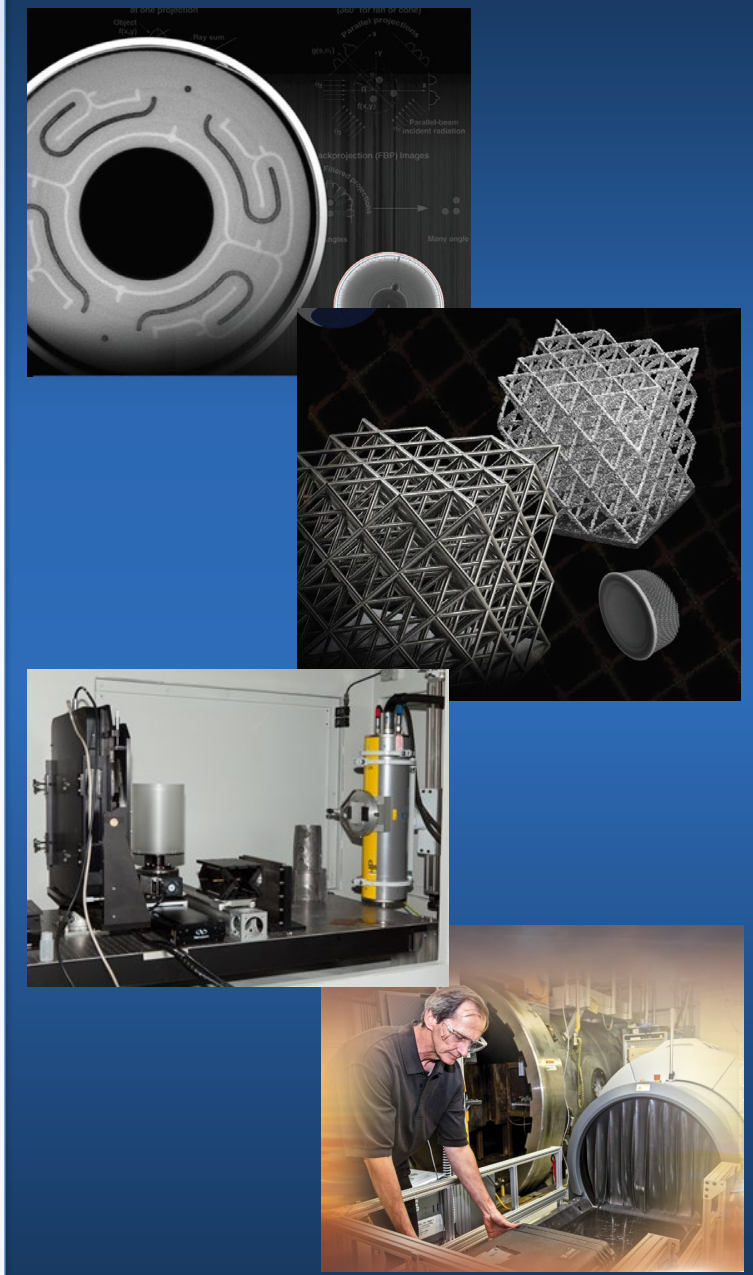
Nondestructive Characterization:

Accurately determine material composition and internal structure of components and assemblies

- Broad application across national security domain, industry, and medicine
- Applied from low-Z aerogels (mg/cm^3) to high-Z special nuclear materials (g/cm^3), from inertial confinement fusion targets (mm) to cargo containers (m)
- Rising demand for: better reconstructed image resolution, capturing dynamic events, automatic threat recognition & automatic defect detection
- Increasing application of machine learning and deep learning to meet these challenges



Panel Overview

- *A Genetic Algorithm Method to Design Optimal Neural Networks and Some Applications*
  - Professor Jian-Qiao Sun, University of California, Merced
- *Conventional Analytic and Emerging Deep Learning Techniques for CT Image Reconstruction*
  - Kyle Champley, Lawrence Livermore National Laboratory
- *Machine Learning Based Nondestructive Monitoring of Advanced Manufacturing Processes*
  - Brian Giera, Lawrence Livermore National Laboratory

Questions are encouraged.
Opportunity for follow up discussions during break.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