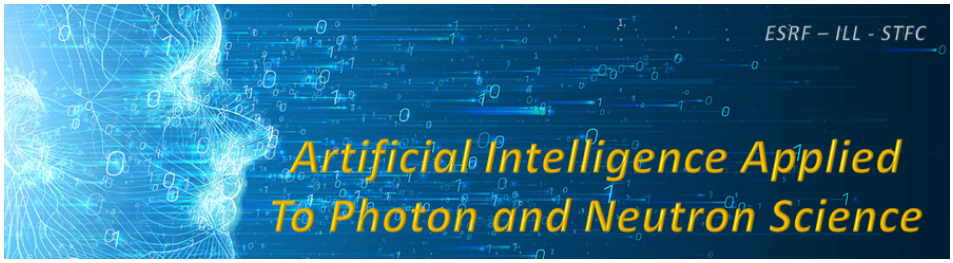

Contribution ID: **83** Type: **not specified**

Deep learning for Synchrotron X-ray Imaging

Thursday, 14 November 2019 10:15 (25 minutes)

X-ray imaging scans at today's synchrotron light sources can yield thousands of image frames per second at high resolution. Current and expected data volumes necessitate having reliable, efficient, and fully automated data processing pipelines. Traditional image processes are limited to many cases because they are not robust enough for strong noises and complex patterns. The deep neural network can emulate the way of human to model the image problem and to process the large datasets automatically. I will present my recent progress in applying deep neural networks to synchrotron X-ray imaging problems. I applied and developed three fundamental functions for X-ray imaging problems: image classification, image transformation, and a solver of inverse problems. I tested and applied these basic functions for tomographic rotation axis calibration, diffraction pattern selection, low-dose tomography enhancement, super-resolution X-ray microscopy, X-ray image segmentation, missing angle tomography reconstruction, and phase retrieval. These works proved the advantage of using deep neural networks to improve the speed and accuracy of synchrotron X-ray imaging.

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Session Classification: Morning 1