



Project Title

Deep Learning for Enhanced Passive Detection

Project Reference Code: DNDO-LBNL-Cooper2

Hosting Site

Lawrence Berkeley National Laboratory
Berkeley, CA

Project Description

The ability to detect and identify weak radiological and nuclear sources in highly complex real world environments is fundamentally limited by the presence and variation of naturally occurring background radiation. The ability of any technique to successfully distinguish source from background is determined, to a large extent, by its capacity to measure, approximate, or otherwise account for the magnitude and variability of the background.

Recent developments supported by DNDO have demonstrated the ability to predict features of the radiological background at a given location using visual imagery recorded at the scene.

A DNDO intern is sought to further explore this concept by applying deep learning techniques (e.g. Convolutional Neural Networks) to large, multi-dimensional data sets comprising video, LiDAR, and radiation data towards the ultimate goal of full spectral prediction from scene data.

A candidate participating in these research activities would have the opportunity to make use of state-of-the-art machine-learning tools deployed on LBNL's high performance computing infrastructure and develop data analysis algorithms in C++ and/or Python.

Disciplines

Information Science and Technology
Applied Mathematics
Analysis
Applied Physics

Mentor(s)

Reynold Cooper, rjcooper@lbl.gov, 510-486-7296

Internship Coordinator

John Valentine, jdvalentine@lbl.gov, 510-486-4920

The name and contact information of the hosting site internship coordinator is provided for further assistance with questions regarding the hosting site; local housing availability, cost, or roommates; local transportation; security clearance requirements; internship start and end dates; and other

administrative issues specific to that research facility. If you contact the internship coordinator, identify yourself as an applicant to the DNDO Summer Internship Program.

Interns will not enter into an employee/employer relationship with the Hosting Site, ORAU/ORISE, DHS, DNDO or DOE. No commitment with regard to later employment is implied or should be inferred.