**Results of using an evolutionary algorithm to optimize a building footprint detecting deep learner's hyper-parameters**Mark Coletti, Jeanette Weaver, Anne Berres, Lexie Yang, Dalton Lunga, Kuldeep Kurtre, Ben Liebersohn, Jibonananda Sanya  
Oak Ridge National Laboratory

[colettima@ornl.gov](mailto:jsglaser@umich.edu)

**Abstract**

We use a deep learner to identify building footprints from satellite imagery that inform population models. However, deep learners have associated hyper-parameters that influence their training, which can have a pronounced effect on the quality of learned models. Unfortunately, since there is little guidance for ideal hyper-parameter settings, the state-of-the-art relies on uniform or random hyper-parameter sweeps to improve model accuracy. We share the results of using an alternative approach to deep learner hyper-parameter tuning that uses an evolutionary algorithm to improve the accuracy of our building footprint detection models. We found that the evolutionary algorithm surprisingly converged on different kernel and batch sizes when compared to a legacy brute force hyper-parameter grid search deep-learner training optimization approach.