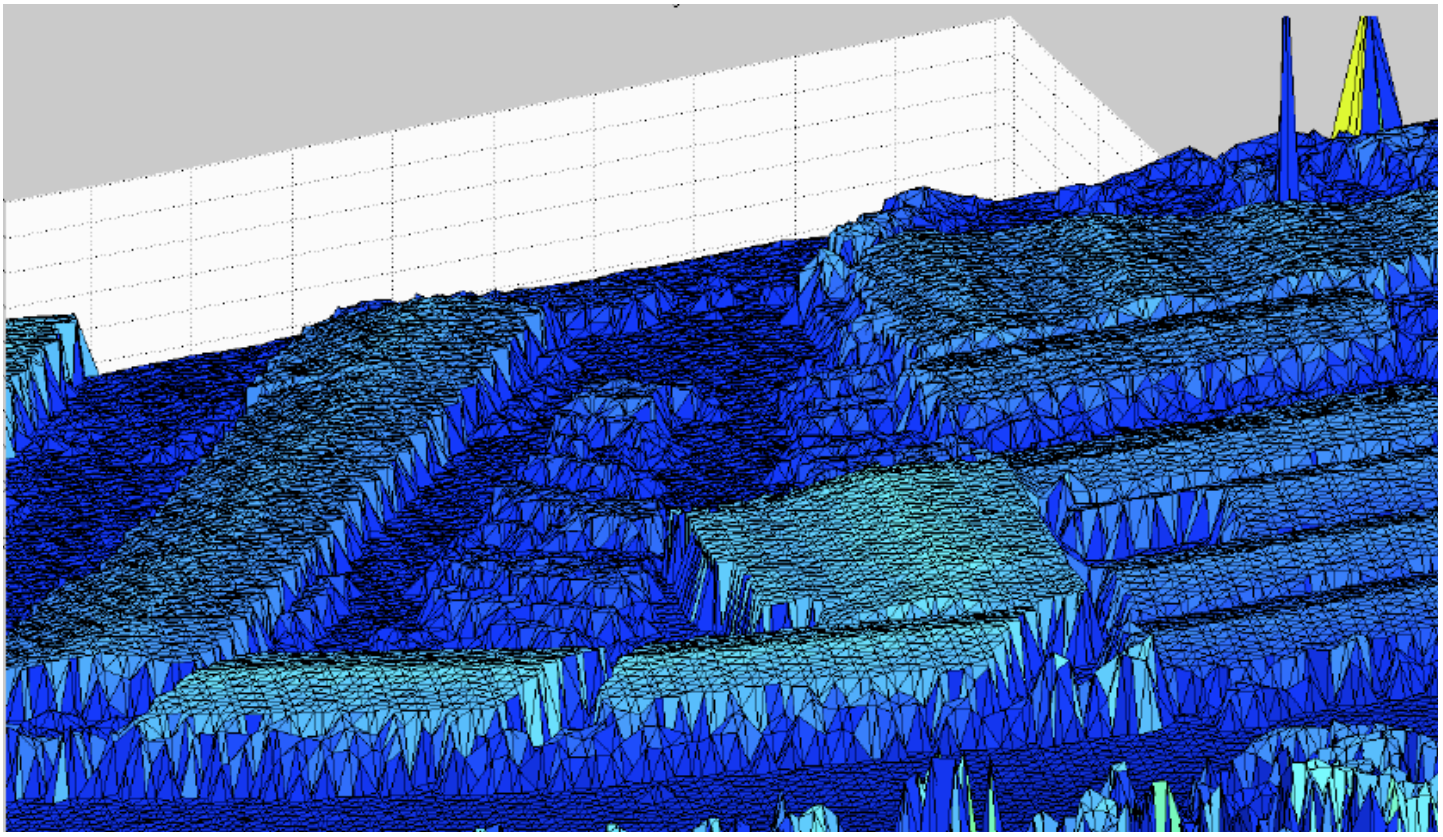

# DR. NICHOLAS SHORTER

## Pseudo Homotopy Trees for Unsupervised Building Detection in Irregularly Spaced LiDAR

***October 30, 2009***
***Olin Engineering Building***
***Room 118EC***
***12 noon to 12:50pm***

A novel paradigm is presented which employs homotopy trees, a branch of topography, for building detection in Light Detection and Ranging (LiDAR) data. The method is developed for irregularly spaced LiDAR data and therefore it can also be applied to rasterized/grid spaced data without any modifications. Using features extracted from either the first and/or last returns (if available) of the LiDAR pulses and the triangulation of the LiDAR data, the proposed method can discriminate ground from non-ground points and subsequently differentiate non-ground as building or non-building points. The method is unsupervised, no training phases are necessary. The only assumption the algorithm makes about the buildings is that they exist as structures which protrude from the ground with a minimal predefined area and height and have a roof. Results are provided for two different actual data sets without changing any of the algorithm's parameters.

Nicholas Shorter graduated with his PhD in Electrical Engineering from UCF in 2009 and is now working as a software engineer at Harris Corporation.