

Research Projects

Megan Kress

NASA CMS group

Jan 2015 - Dec 2016

- Voxelizing LiDAR data (C++) - <http://megankress.github.io/LiVoxGen/>
- Extracting LiDAR metrics for G-LiHT project in AK - <https://www.wired.com/2014/12/alaska-laser-survey-3d-map/>
- Attended and presented at August 2015 meeting in DC

Food recognition course project

Fall 2016

- 15 food categories with collected photos
- Features: color histograms, the bag-of-SURF method
- Classifier: Support Vector Machine (MATLAB)

Variable Radius Plots project

Jan 2017 - Present

- Penobscot Experimental Forest, Noonan Research Forest, Sonoma County
- Hierarchical modelling with different spatial parameters (C++)
- Publication:

Ver Planck, N. R., Finley, A. O., Kershaw Jr, J. A., Weiskittel, A. R., & Kress, M. C. (2018). Hierarchical Bayesian models for small area estimation of forest variables using LiDAR. *Remote Sensing of Environment*, 204, 287-295.

Pinterest pin classification course project

Spring 2017

- ~3,000 math education pins
- Classification methods
 - Images: SIFT (MATLAB)
 - Text: Bag of Words (R)
 - Color histograms: KNN, random forest, CNN, Naive Bayes (MATLAB/C++)
- Shiny App (text): https://mckress.shinyapps.io/cse881_proj/

Clustering course projects

Fall 2017

- Goal: individual tree detection from LiDAR point clouds
- Topological approach: Watershed Algorithm (MATLAB)
- Optimization approach: Ant Colony Optimization (C++)

Gap filling project

Fall 2017 - present

- Data types: LiDAR, NDVI reflectance rasters
- Algorithm: Spatial Factor Nearest Neighbor Gaussian Process (C++)