Homework 3 Report

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1 Data

EarthExplorer[1] is a website where USGS makes available a large repository of satellite imagery for scientific purposes. We downloaded a scene from a suburb of Riverside using the High Resolution Orthoimagery dataset. The initial scene was large, so we sample two images (figures 1 and 2) which collect enough and diverse types of objects. For this assignment, we decided to classify pools.

For the first image we collected a total of 100 points, 50 of them where pools and the remaining were not pools as our training set.

2 Classification

For the classification part, we trained a kNN classifier using the training set. We used the rminer[2] package provided by the R project (`https://www.r-project.org/`) using the default parameters.

3 Validation

For validation, we used the second image to collect a group of 50 points as our testing set. We created a grid of 50x50 pixels in which we checked how many of testing points belong to the same cell. If more than one point belongs to the same cell, we keep just one of them. As a result, we kept 38 valid points.

ROC AUC

[1] `http://earthexplorer.usgs.gov/`
[2] `https://cran.r-project.org/web/packages/rminer/index.html`

Figure 1: First image used for training.

Figure 2: Second image used for validation.

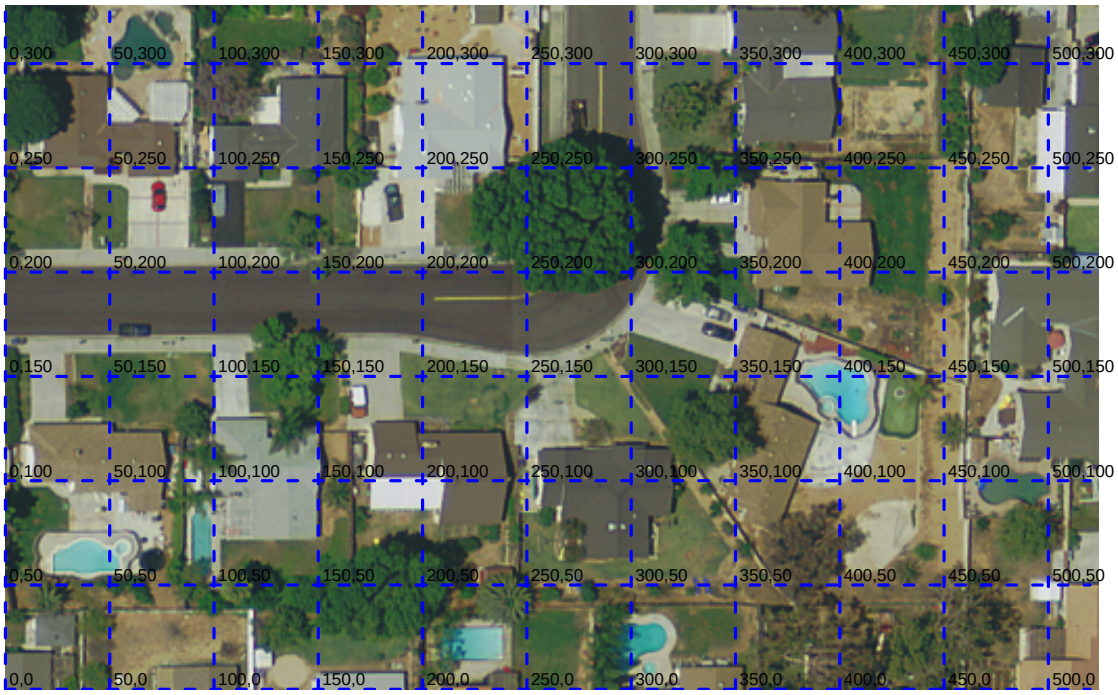

Figure 3: Details of the grid displayed in second image for validation.

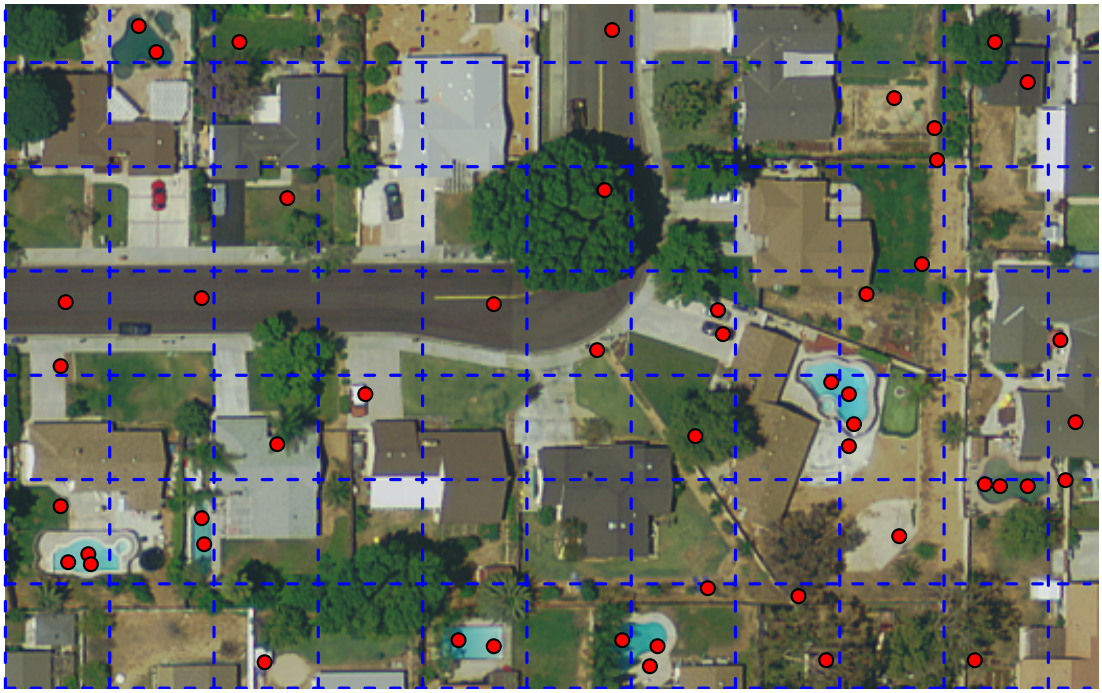

Figure 4: Locations for validation set in second image.

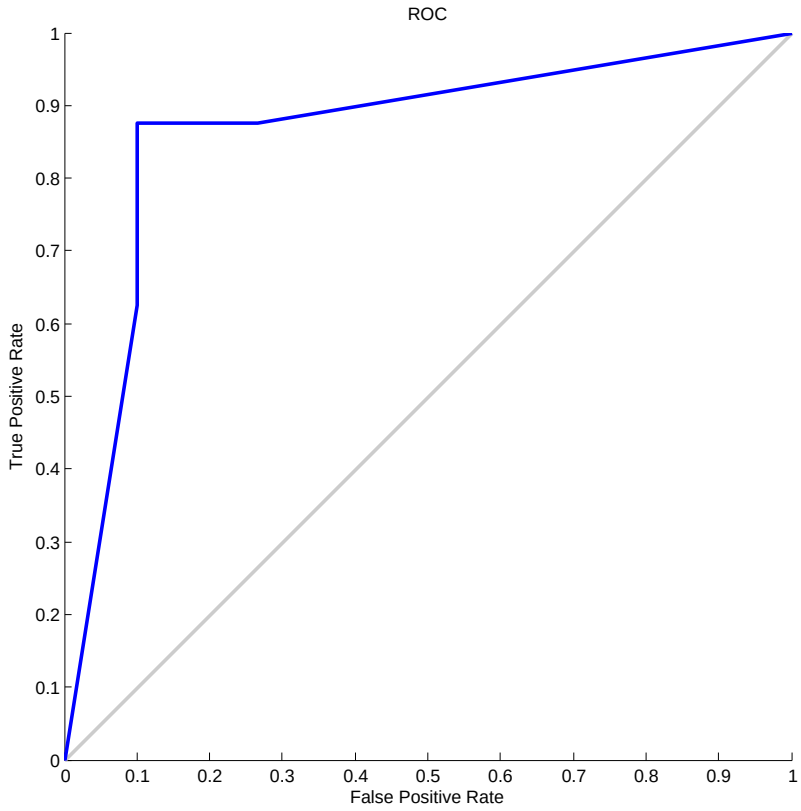

Figure 5: Locations for validation set in second image.