Detect invasive plants in Florida coastal areas using an Image Retrieval (IR) approach and remote sensed data

Introduction:
Extensive actions are reducing the presence and impacts of invasive nonnative plants. To periodically update performance measures of such actions, high resolution remote sensed data is essential. The voluminous data poses a great challenge in terms of cost and efforts if image classification is used. Invasive plants may occupy only a small proportion and a full classification is not necessary. Conversely, IR represents a promising and invaluable approach for such a target-search task.

Objectives:
To develop a novel IR approach to detect invasive plants, specifically Australian Pine, using DOQQ and LIDAR data in coastal areas of Florida.

Approach:
IR is similar to document search on the Web, but intends to retrieve targets from image databases. An IR system is mainly composed of image segmentation, content representation and similarity. We first divided images into regions. For each image region, the spectral, texture and object height information were extracted to represent the contents. By comparing the similarity between the target classes and image regions, similar ones were retrieved and performance was assessed against ground truth.

Benefits:
A cost-efficient image retrieval method was developed for detecting Australian Pine. It can be extended to monitor invasions of other exotic plants. The extracted Australian Pine map can be used to update performance measures for past actions and to support future management decisions.

Location:
About 35 square miles of coastal areas in south Palm Beach.

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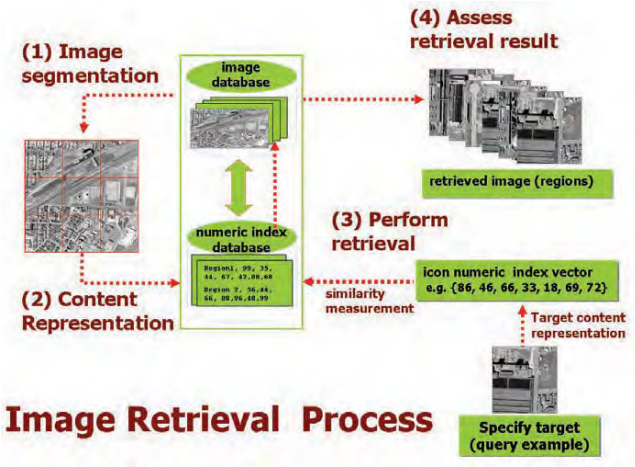

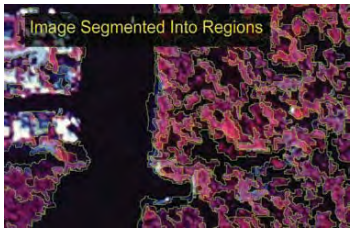

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