LeafView: A User Interface for Automated Species Identification and Data Collection

Overview
LeafView is a Tablet-PC–based user interface for automated identification of botanical species in the field, developed by the Columbia University, University of Maryland and Smithsonian Institution Electronic Field Guide Project. Botanists participated in the design process and user testing. The prototype has been field tested on Plummers Island, MD and is currently in use by Smithsonian botanists.

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Collection
Leaf image is captured with wireless camera and transferred to tablet. Context, such as GPS coordinates, date/time, and collector, is saved.

Segmentation and Search
Image is automatically segmented and displayed to user to verify segmentation quality. Matching algorithm is initiated in background. (Segmentation and matching algorithms are developed by our colleagues.)

Inspection, Comparison, and Matching
Specimen is displayed, along with ranked results from matching algorithm. Text and images of matched species from Smithsonian collection are inspected through zooming to examine venation and additional data. Prospective identifications are recorded in history with sample data.

History
Browsable history of samples and context from collection are maintained for tracking and comparison during a collection trip.

Working Prototypes
The field prototypes use Motion Computing LE1600 and Lenovo ThinkPad X41 Tablet PCs, a Delorme Earthmate GPS, a Nikon Coolpix P1 Wi-Fi camera, and a Sony Ericsson T616 Bluetooth camera phone.

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