

# **UCLA**

## **Posters**

### **Title**

NIMS Metrology

### **Permalink**

<https://escholarship.org/uc/item/49b1n75d>

### **Authors**

Eric Yuen  
Michael Stealey  
Willie Chen  
et al.

### **Publication Date**

2004

# NIMS METROLOGY

Eric Yuen, Michael Stealey, Willie Chen, Yueng Lam, Steve Liu, Chris Lucas, Professor W. Kaiser  
**NIMS METROLOGY**

## Introduction: Use of Optical Landmarks to Map Environmental Phenomena

### Optical Landmarking

- Optical Landmarking combines information about the nodes position, captured visual information, in order to gain useful information about phenomena in the environment.



### Mapping Environmental Phenomena

- Phenology provides a direct measure of rate of growth
- Phenology combined with other NIMS measurements to enable investigation of relationships between microclimate and growth.

## Problem Description: Identifying objects in the Environment

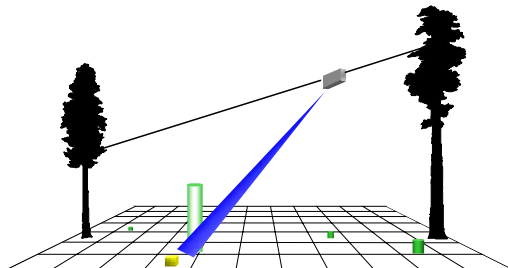
- NIMS must accurately determine location, size and attributes of objects
- Comprehensive spatiotemporal mapping of plant forms in 3D Transect
- Diverse viewing perspectives of these objects must be fused together
- Determination of the costs associated with obtaining multiple views



## Proposed Solution: Calibration using Optical Landmarks and Analysis with Data Fusion

### NIMS Localization and Phenology

- Multiple Landmarks can be used to localize the NIMS node
- Actuation reduces problems of object occlusion
- Multiperspective evidence allows objects to be viewed from multiple angles
- Calibrating Landmarks allow NIMS node to determine pose information of objects and plants in the transect
- Diversity of viewing perspectives allows fusion to exploit diverse angular views
- Enables growth tracking of plants by imaging



### Use of Bayes Engine for Data Fusion

- Data fusion is necessary to fuse multiple perspectives
- Also need to fuse data from multiple sources
- Sensitivity Analysis permits sensor selection
- Bayes Engine accepts multiple applications and can consider data from multiple sources

