

Tools for Dynamic Deployment and Data Management

Matthew Mayernik¹, Keith Mayoral², Martin Lukac³, Mark Hansen², Christine Borgman¹
 UCLA, 1. Department of Information Studies, 2. Department of Statistics, 3. Department of Computer Science

Deployment Challenges and System Development Motivations

- CENS sensing systems are being deployed in many different real-world settings.
- CENS sensor deployments are highly variable
- Specialized and often developmental systems and unpredictable field settings leads to faulty data
- Needs of the scientists may change and new questions may arise after initial data are collected and explored.
- Managing sensor deployments and the resulting data can be challenging



- Need dynamic deployment tools that allow researchers to view and interact with deployment data while data collection is ongoing..
- Interactive systems can reveal problems as they arise, which can then be used to improve existing deployments and help design future deployments.
- Need to keep track of the ways that problems are addressed
- Need to share deployment information and data among distributed teams of researchers

CENS Deployment Center (CENSDC) (<http://censdc.cens.ucla.edu>)

- Web-based database for CENS deployment information
 - Researchers make final decisions on what data to collect and how to set up field experiments
 - CENSDC is designed to collect information about what actually takes place in the field
 - Information from past deployments can feed into the design of the next deployment iteration

Task

1. TRANSCENT SETUP - The following are the steps involved in setting up a NIMS-RED transect:
 - 2: Set up anchoring ladder, attach tripod wheel to top
 - 3: Attach tie-downs to anchor points and string up static cable
 - 4: Attach end pieces and NIMS motor to static cable
 - 5: String up ver, hor, calib cables

- Important information relating to human roles in data collection include:
 - Deployment dates and locations
 - People involved
 - Equipment used and deployed
 - Data collection tasks
 - Post-deployment notes
 - Suggestions/recommendations for future deployments

Sensorbase

(<http://sensorbase.org>)

- Web-based database for CENS sensor data
 - User-defined projects can be set up to automatically collect sensor data from remotely deployed sensors
 - Data can be kept private or shared with fellow researchers registered with Sensorbase
 - Researchers can be alerted by email when user-defined conditions exist within incoming sensor data
 - Programmatic access to Sensorbase features allow outside services to access and manipulate existing data
 - Generic enough to be applicable to most data research scenarios while being openly available for individual modifications

CENS Seismic Deployment



- Facilitating high quality data through interfacing with daily data streams
 - Mapping the wireless communication quality between installed seismic stations
 - Tallying daily data capture and conversion rates
 - Displaying sparklines of real-time sensor readings

Future Directions – Interconnections

- These systems enable researchers to:
 - Discover problems with data as they arise
 - Identify and describe the problems
 - Annotate the solutions for future deployments
- **The resulting data should be of higher quality in the short term, and more easily used and reused in the long term**
- Future plans - better connecting CENSDC and Sensorbase:
 - Allowing Sensorbase to keep track of and display deployment related information from the CENSDC
 - Providing complete programmatic support so that researchers can access data from CENSDC deployment pages using Sensorbase functionalities

