



DWR Snow Surveys

Newest Addition, Current Site Maintenance and future plans

By
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Outline

- Previous work and background
- Site Maintenance and lessons learned
- Upgrades
- Instrumentation Parameters
- Design
- Challenges



Background

Bryan Prestel

Electrical and Electronic Engineering (EEE)

Analog and Digital Controls emphasis

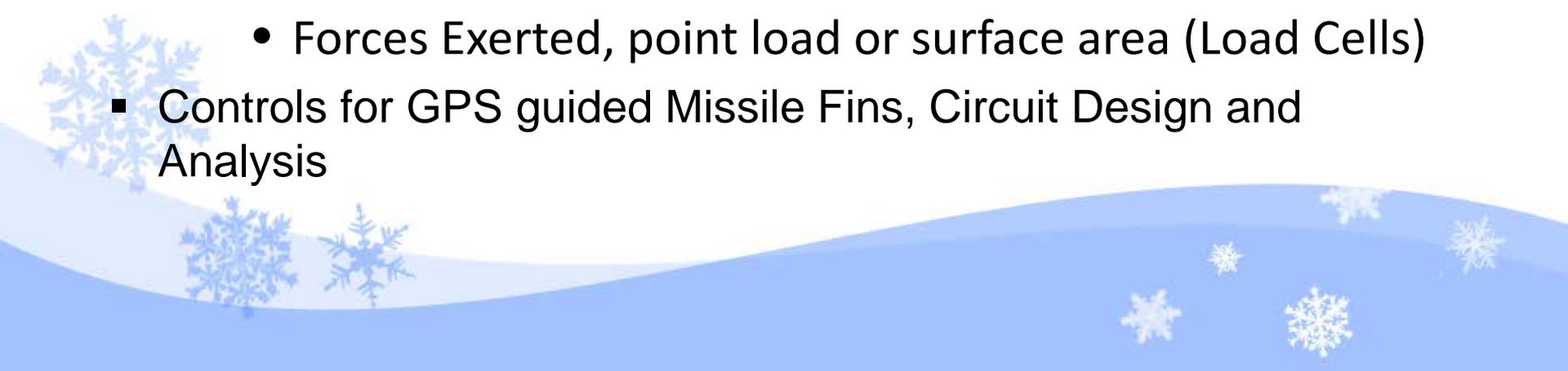
California State University Sacramento (CSUS)

Graduated December, 2013



Previous Work

China Lake Naval Air Weapons Station

- Instrumentation Engineer/Intern for 3.5 years
 - Calibration Management
 - Measuring Harsh Environments
 - Explosive Forces (Pressure Transducers)
 - Aircraft Frame Vibration (Accelerometers)
 - Forces Exerted, point load or surface area (Load Cells)
 - Controls for GPS guided Missile Fins, Circuit Design and Analysis
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DWR Snow Surveys New Addition

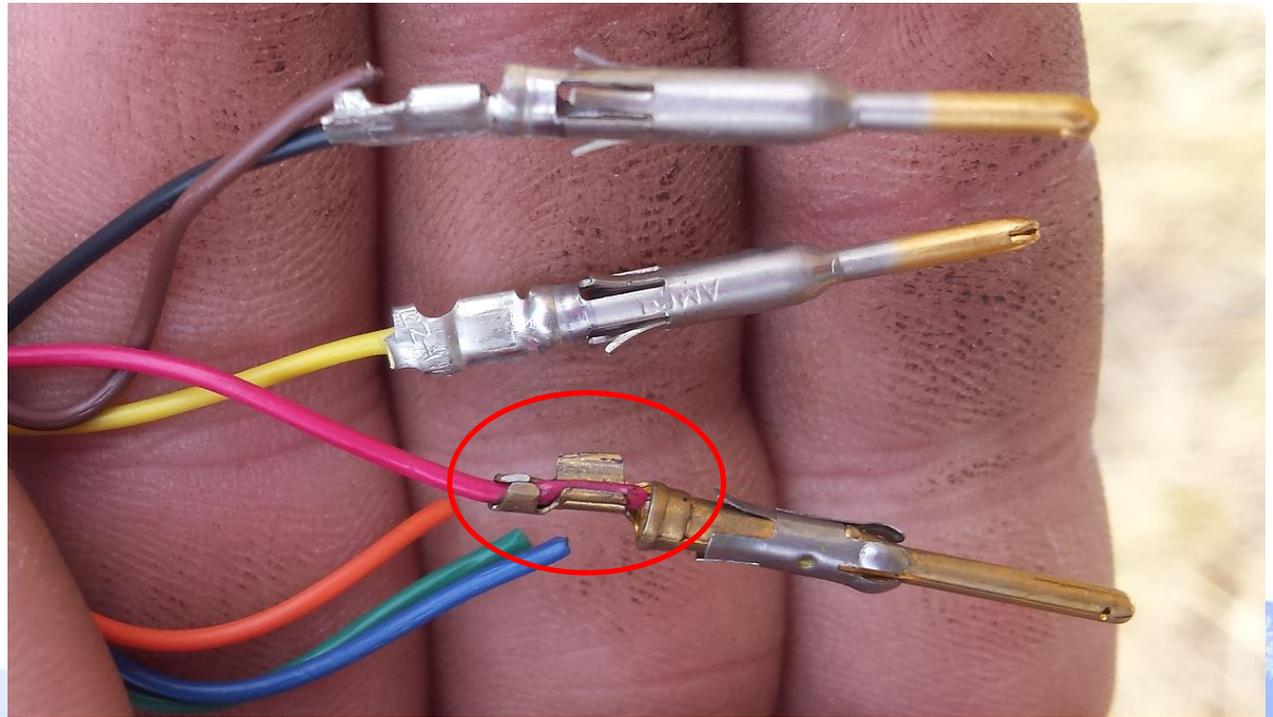
FNG
Fun New Guy



Site Maintenance

Lessons Learned

- Environmental Protection
- Crimping
- Programming



Instrumentation and Data Acquisition

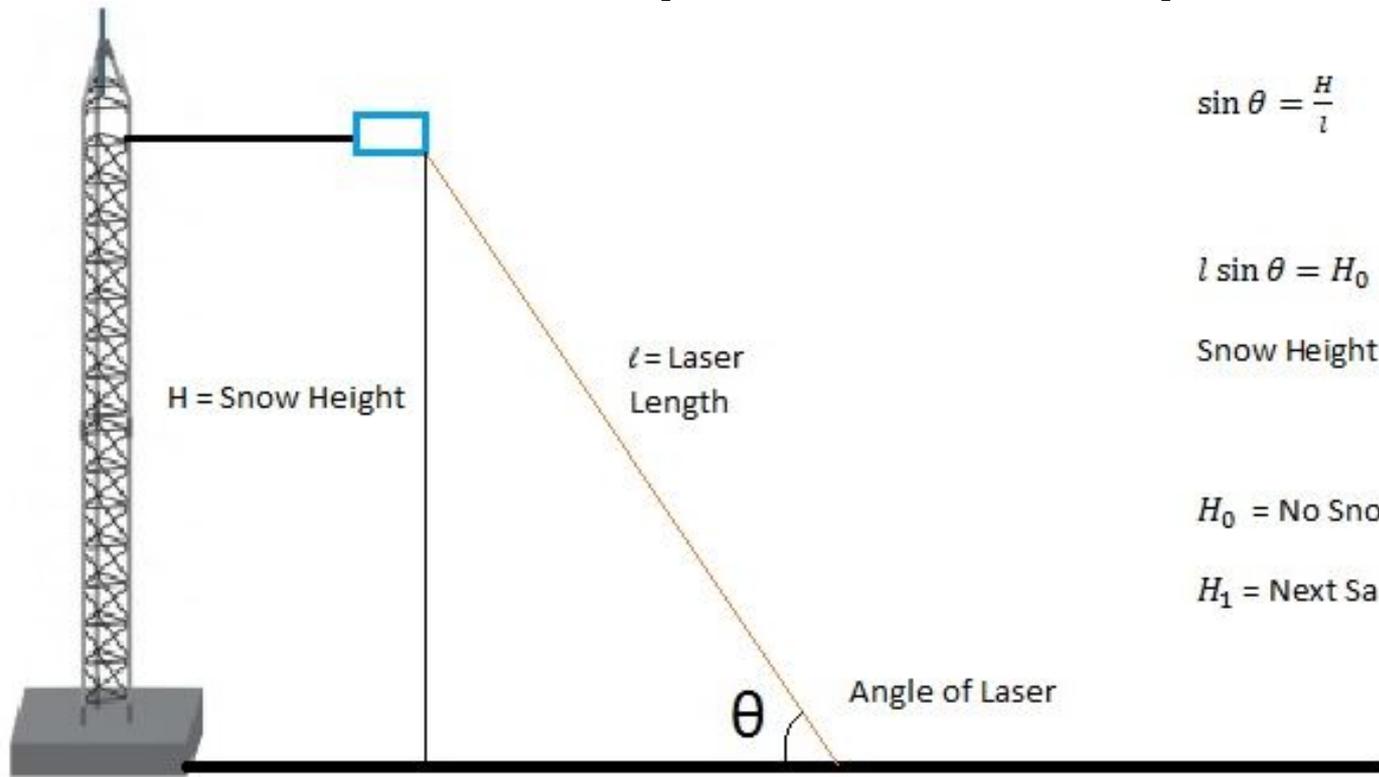
- Robust
- Reliable
- Accurate
- Ease of maintenance
- Life Cycle
- Interoperability
- Cost to Benefit



Instrumentation continued

How They Work

Electrically and Mathematically



$$\sin \theta = \frac{H}{l}$$

$$l \sin \theta = H_0$$

$$\text{Snow Height} = (H_0 - H_1)$$

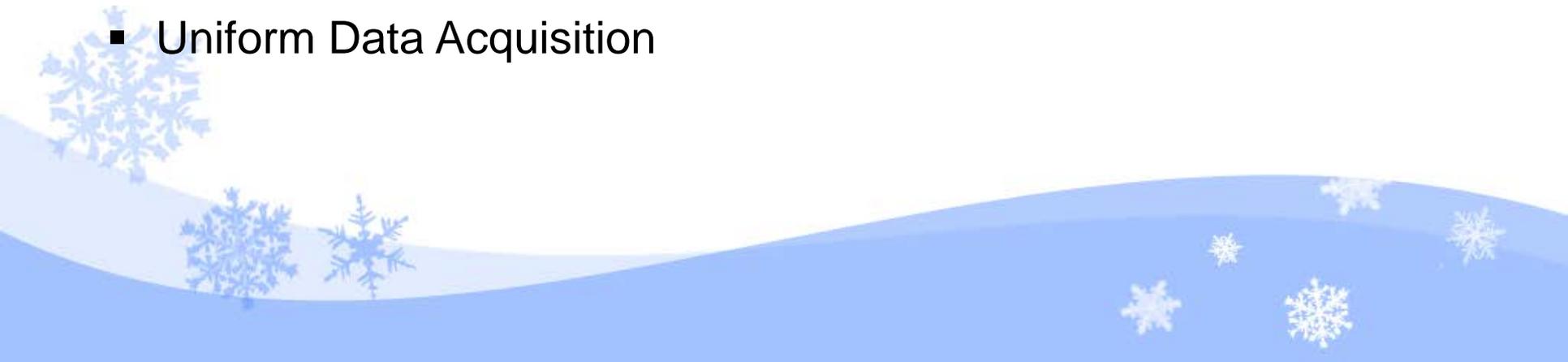
H_0 = No Snow on Ground

H_1 = Next Sample

Upgrades

Fresh Start

- Standardizing Sites
 - Instrumentation (Wind, Radiation, Soil, SWE, Snow Height...etc)
 - Pin Outs
 - Universal Program
- Uniform Data Acquisition



Design

- Independent Sensors
 - Easy Installation of Sensors (Pig Tails Mil Spec)
 - Power Redundancy
 - Fail Safes
 - Software and Analog
 - Vital Instruments
 - Two Way Communication
 - Relay Control
 - Din Rail Mounted
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Challenges

- Environmental Factors
- Electrical
- Data Acquisition
- Access



Summary

- Background and Knowledge
- Lessons Learned
- Upgrades
- Design
- Challenges



An aerial photograph taken from the perspective of someone inside an airplane, looking out over a vast landscape. The top of the image shows the underside of the airplane's wing and fuselage. Below, a large, multi-lobed reservoir or lake system dominates the middle ground, with numerous small islands and peninsulas. The water is a pale, milky blue-green color. The surrounding land is a mix of brownish-tan and green, suggesting a semi-arid or high-altitude environment. In the far distance, hazy mountain ranges are visible under a sky filled with soft, white clouds. The overall lighting is bright but diffused, typical of an overcast day.

Questions??

