

**Ready,
Set,
Remote:
Online Labs**

*William Kitch
July 27, 2020*



GEO-INSTITUTE



David L. Hirschfeld
Department of Engineering

ENGINEERING@ANGELO.EDU

Outline

- Types of online labs
- Resources for online geotechnical labs
- Tools for building online content

Types of online Labs

- Remote lab
- Simulation
- Video Recorded

Remote labs

- Student access and operate lab equipment remotely over web
- Student control testing operation and data collection
- Testing digitally controlled with digital data collection
- Used mostly for nondestructive tests: circuits & electronics, wind tunnel, pumps
- Significant research and development from mid 1990s through 2015
- Long-term maintenance & operations are big limitations

Remote Lab Development Opportunity?



Simulation

- Numerical simulation of physical lab experiments
- Geotechnical examples
 - Triaxial strength tests
 - Consolidation
 - Hydraulic conductivity
- Number of programs developed 1990s and 2000s
 - University of Arizona
 - University of Alberta, Edmonton
 - University Tennessee, Knoxville/Georgia Tech, India Inst Tech
 - Geo-Sim <https://igrip.iitgn.ac.in/geo-sim/>
- Long-term maintenance major limitation

Video Capture with Data

- Video a faculty member, grad student, or lab tech performing experiment and films steps
- Provide students with raw data to analyze
- Sometimes use video capture of instruments or gauges


Resources for Online lab

- MyGeoWorld Group: Geotech Lab Instruction Share (GLIS)
 - <https://www.mygeoworld.com/groups/geotech-lab-instruction-share>
 - Catalog of who has laboratory resources: Videos & Data
- Curated YouTube Video Resources
 - Bill Kitch Angelo State University
<https://www.youtube.com/channel/UCyt3w3SogxUSJ7RSxQusXXA>
 - Eric Steward, University of South Georgia
<https://www.youtube.com/channel/UCP6v5TH8RF01sHzjyCmaTTw>
 - NDSU Upper Great Plains Transportation Institute
<https://www.youtube.com/playlist?list=PLk1zpQxZlZO24002MrjUADNHdA1i1Y3tL>
 - Middle Eastern Technical University
<https://www.youtube.com/user/METUGeotech/videos>
 - Ronaldo Luna, St. Louis University/Missouri S&T
<https://www.youtube.com/user/ronaluna>

Types of lab Videos

- Theory Presentations
 - Classroom Lectures on theory behind lab
- Pre-lab preparation
 - Recap of theory
 - Overview of lab procedure
- Lab execution
 - Step by step procedures
 - Specimen preparation
 - Data collection

Other good resources

- Geoengineer.org
 - Education menu
 - Lab testing resources
 - Lab Manual 
- USUCGER
 - Resources & Media>Teaching Aids

Tools for creating online content

- Video recording
 - iPhone: Use external lapel mic
 - Video camera
- Graphics, Text, Simple animations
 - PowerPoint (<https://www.youtube.com/watch?v=S5Zt2qo63qY>)
- Hand drawing & Writing
 - Doceri \$30 (<https://www.youtube.com/watch?v=QrIaPVYS7og>)
- Video Editing
 - Camtasia ~\$250

Summary

- Remote & Simulated labs: Seem to die after one generation
- Video labs with prerecorded data currently most viable method
- Plethora of online videos—curating them for your course and application is the issue
- Video creation and editing tools are inexpensive
- Time is the cost—payoff is long-term usage