Hour of Cyberinfrastructure

AAG 2019
Washington, D.C.

Eric Shook
Coleman Shepard
Overview

- NSF funded project
- Data Science Gateway
- 17 Interactive Lessons
  - Parallel Computation
  - Big Data
  - Cyberinfrastructure
  - Computational Thinking
  - Spatial Thinking
  - Geospatial Data
  - Spatial Modeling & Analytics
  - Interdisciplinary Communication
Hour of CI - NSF Project

Hour of Cyberinfrastructure: Developing Cyber Literacy for Geographic Information Science

PI: Eric Shook
Co-PIs: Forrest Bowlick, Karen Kemp, and Anand Padmanabhan

Collaborative CyberTraining Awards: UMN, UMass, UIUC, and USC
OAC 1829708-UMN (total award ~$480,000)

Duration: Aug 1, 2018 - July 31, 2020
Motivation

- Accessibility to Cyberinfrastructure
  - Platform
  - Lesson Material

- Enable the Learning of Foundational Skills for Complex Topics Aimed at Social Science

- Start to Bridge Communication Disconnects
Cyber Literacy for GIScience

- Cyberinfrastructure
- Parallel Computing
- Big Data
- Computational Thinking
- Interdisc. Communication
- Spatial Thinking
- Geospatial Data
- Spatial Modeling & Analytics
Jupyter

- Flexible Platform
  - Python
  - HTML | CSS
  - Javascript
  - Julia
  - R
  - Linux Commands
- Heavily Used in Industry
- Narrative Construction for Lessons
Jupyter

- Environment Control
  - Geospatial & Data Science Packages
- Flexible Resource Allocation
  - Scalability
- Reproducible Environments
- Easy for Open Source
Platform

- Jupyterhub | JupyterLab
- Hosted using Jet-Stream Cloud Platform
- Authentication through XSEDE
- Ansible Configuration and Deployment
Interactivity

- User Design (UI | UX)
- User Engagement
- Tool for Knowledge Retention
- Build Narrative Construction
- Example of Types
  - Maps
  - Buttons
  - Dynamic Graphing
  - Exploratory Visualizations..
Data Collection

- Jupyter Widgets
  - Radio Buttons, Text Boxes, Check Boxes, etc
- Gain Insight into User Behavior
- Metrics Collected
  - User
  - Lesson | Question | Answers*
  - Correct or Not
  - Attempts
  - Date Accessed
  - Start Time
  - End Time
  - Time Taken
Customized Widgets

- HTML | CSS | Javascript
  - Flipcards
  - Matching
  - Forms
  - Other Modular Components
- D3.js
  - More Complex
- Collection Mechanisms
Pre AAG Workshop

April 1st - April 2nd, National Zoo

- First Meeting Face to Face
  - Lesson Developers
  - Project Personnel
- Discussion Around Lesson Construction
- Conceptualize Interactive Pieces for Each Narrative
Next Steps

- Collaboration with Lesson Developers
  - Interactive Components
- Migration to Docker from Ansible
- Job Submission to XSEDE Super Computers
- Data Collection for Customized Widgets
Project Team

- Eric Shook - Lead PI
- Karen Kemp - Co-PI
- Anand Padmanabhan - Co-PI
- Forrest Bowlick - Co-PI
- Fritz Vandover - Assessment Team
- Coleman Shepard - RA

Lesson Developers

Forrest Bowlick, Coline Dony, Aaron Weeden, Jennifer Swift, Eric Shook, Nafiseh Haghtalab, Michael Page, Craig Stewart
Questions?

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