Birds of a Feather Meeting
2017

Laboratory for Advanced Visualization & Applications
University of Hawaiʻi at Mānoa & Hilo
Jason Leigh, Dylan Kobayashi, Francis Cristobal, Jared McLean

Electronic Visualization Laboratory
University of Illinois at Chicago
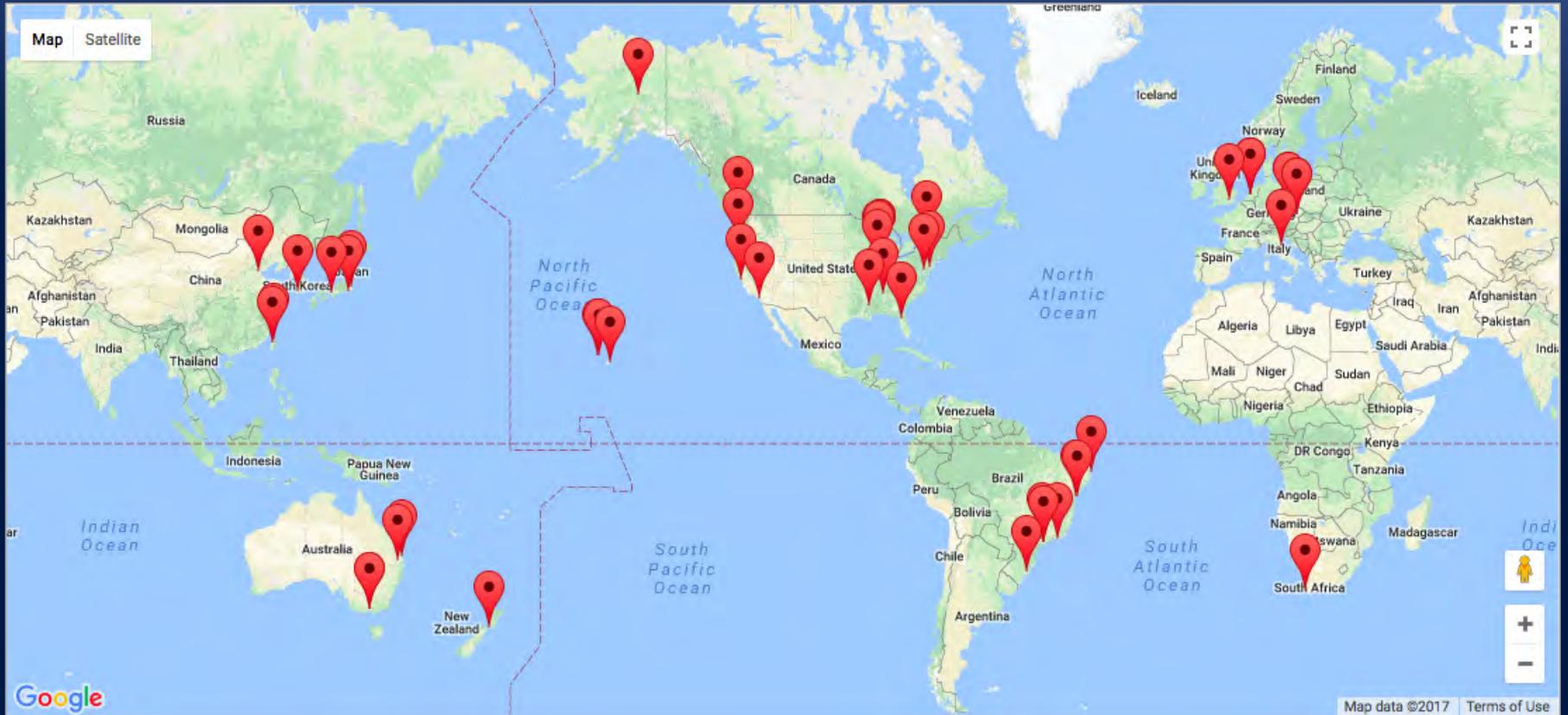Maxine Brown, Luc Renambot, Lance Long,
Arthur Nishimoto, Krishna Bharadwaj, Andrew Burks, Victor Mateevitsi
Kristine Lee

www.sagecommons.org

SAGE2 Community Update

SAGE2 User Community 2017
84 Sites: 42 International + 42 National

SAGE2 User Community 2017
84 Sites: 42 International + 42 National

AUSTRALIA
- Monash University
- RMIT, (VX)Lab
- University of Sunshine Coast (3)
- University Southern Queensland
- University of Technology Sydney

BRAZIL
- Bahia School Medicine & Public Health
- Catholic University of Salvador
- Federal University Paraíba, LAViD
- Federal Univ. Rio Grande do Sul
- Mackenzie University, LabCine
- National Institute of Space Research
- RNP, Rio de Janeiro (2)
- University of Campinas, Cinema
- University of Sao Paulo, LARC
- University of Sao Paulo, LASSU (2)

CANADA
- Ciena Research Labs
- Simon Fraser University, IRMACS

CHINA
- Tianjin University of Technology

CZECH REPUBLIC
- CESNET and Czech Technical University, SAGElab
- CESNET, Mobile SAGE
- Masaryk University, Cyber-Exercise & Research Platform Proj.
- Masaryk University, Lab of Adv. Networking Technologies (2)
- Mavenir, Network Ops Center

ITALY and SWITZERLAND
- University Urbino and ETH Zürich

JAPAN
- National Institute of Advanced Industrial Science & Technology (2)
- NTT Network Innovation Labs
- Osaka Univ., Cyber Media Center

KOREA
- Gwangju Institute of Science & Tech

NETHERLANDS
- Air France-KLM, CIO Tech Office
- SURFsara, Collaboratorium
- University of Amsterdam, SNE

NEW ZEALAND
- REANNZ

SOUTH AFRICA
- University of Cape Town, Informatics and Visualisation Lab

TAIWAN
- National Center for High-performance Computing
- National Chung Hsing University

UNITED KINGDOM
- Imperial College London

UNITED STATES
- Adler Planetarium
- Argonne National Laboratory, ALCF
- Caterpillar Inc.
- Catherine Cook School
- Chaminade University of Honolulu
- Digital Manufacturing and Design Innovation Institute (DMDII)
- Hawaii State Energy Office
- Jackson State University, ECE
- Kamehameha School
- NASA Marshall Space Center, SPoRT
- Northwestern University, iCAIR
- Stanford University, HIVE
- University of Alaska Fairbanks, DTN
- Univ. of Calif, San Diego, Calit2-QI

- Univ. of Florida Gainesville, ACIS
- University of Hawai'i at Hilo (3)
- Univ. of Hawai'I Mānoa, C-MORE
- University of Hawai'I Mānoa, HIGP
- University of Hawai'i at Mānoa, Information Technology Center
- University of Hawai'I Mānoa, i-LAB
- Univ. of Hawai'i at Mānoa, LAVA (3)
- University of Hawai'I at West Oahu, Academy for Creative Media
- University of Illinois Chicago, ACM/LUG Student Chapters
- University of Illinois Chicago, Comm.
- Univ. of Illinois Chicago, EVL (5)
- University of Illinois Chicago, Maker Space
- University of Illinois at Chicago, Innovation Center
- Univ. Illinois Chicago, Ophthalmology
- Univ. Illinois Chicago, Pathology (2)
- Univ. Illinois Urbana-Champaign, NCSA
- University of Maryland, Baltimore County, ARC
- University of Oregon
- Univ. of Pennsylvania, Idea Factory

SAGE2 User Sites 2017 Examples
International

AUSTRALIA, Monash Univ., Monash Immersive Visualisation Platform

CHINA, Tianjin University of Technology

JAPAN, National Institute of Advanced Industrial Science and Technology (AIST)

TAIWAN, National Chung Hsing University

SAGE2 User Sites 2017 Examples
National

USA, Caterpillar Inc.

USA, Univ. Alaska Fairbanks, Decision Theater North

USA, University of Florida Gainesville, ACIS

USA, University of Hawaiʻi at Hilo, Mookini Library

USA, Univ. of Hawaiʻi Mānoa, Information Technology Center

USA, University of Illinois at Chicago, Innovation Center

USA, Univ. Oregon, Allan Price Science Commons & Research Library

USA, Univ. Pennsylvania, Biomedical Informatics, Idea Factory

SAGE BOF 2017

www.sagecommons.org

2017 Survey Statistics

- 67% educational institutions, ~10% national labs, ~10% companies
- 40% of organizations have more than 1 wall
- Evenly spread between Windows & Linux
- Over 55% use 1 PC
- Main uses are for lecturing, presentations, holding meetings
- Favorite Features: Ability to drag content from laptop to wall, desktop sharing, collaborative interaction, ease of deployment, multiple pointers, web-based, remote interaction, ability to create custom 3D (WebGL) applications

For more survey results: http://bit.ly/2z2vAYg

Type of Content

What type of content is displayed on your wall?

65 responses

Category	Responses
Astronomy	16 (24.6%)
Bioscience	18 (27.7%)
Computer Sci...	46 (70.8%)
Chemistry	9 (13.8%)
Creative Arts	22 (33.8%)
Geoscience	24 (36.9%)
Medical	23 (35.4%)
Physics	19 (29.2%)
Meteorology	2 (3.1%)
Communicati...	1 (1.5%)
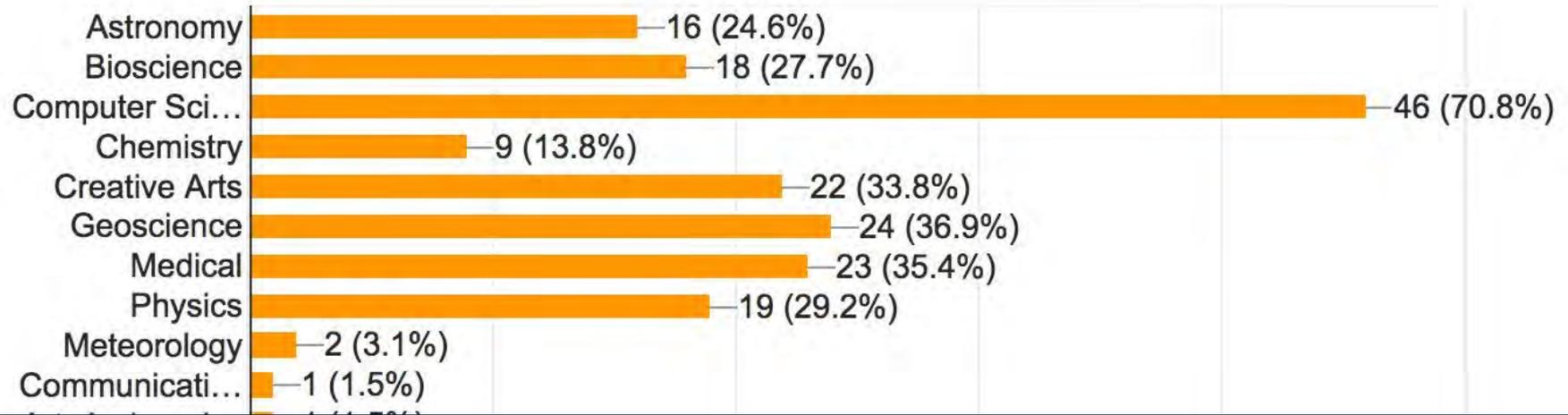
Desired Future Features

Are there new SAGE2 capabilities you would like to see? (59 responses)

Feature	Count
Software Def...	20 (33.9%)
Video stream...	53 (89.8%)
Pixel streaming	15 (25.4%)
Stereoscopic...	26 (44.1%)
Web VR (we...	38 (64.4%)
Jupyter integ...	20 (33.9%)
Cloud-based...	27 (45.8%)
Other	3 (5.1%)

Web Apps Survey

http://sage2.sagecommons.org/SAGE2-Apps-edited.htm
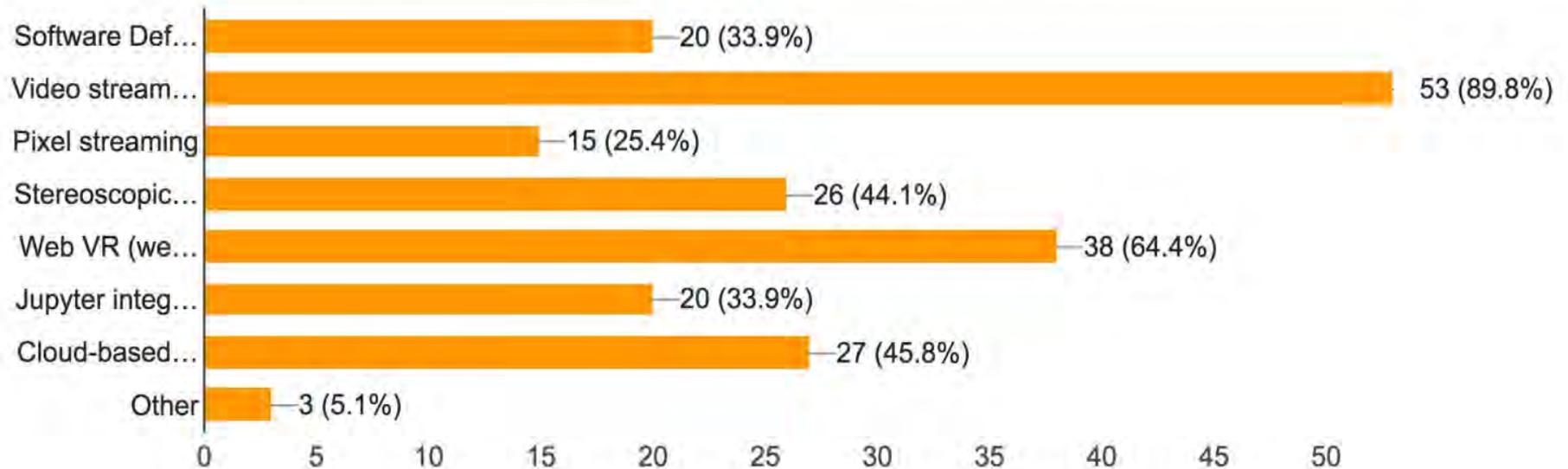
Agricultural Research Service, AgroClimate, Appear.in, ArcGIS open data portal, ArcGIS open data portal, Arctic DEM Explorer (ArcGIS), AWWapp, Bio.js, BoxDICOM, Canva, ChartAccent, Chicago Data Portal, Circos, Cornerstone, Crime Mapping, CyberGIS, CytoScape, D3.js Snippet, Earth: Wind, Weather, Ocean map, Emperor, Epiviz, Excellence, Networks, Exoplanet Data Explorer, FleetMon, Flowing Data, Google Docs, Google Hangout, Google Public Data Explorer, Google streetview, Grafana, Institute of health metrics and evaluation, JBrowse, Jupyter, MetaViz, Nano Hub, NASA Worldwind, National Academies Press, NGL Viewer, NOAA History Hurricane Track, NORSE, Ocean Data View, Ocean Data Viewer, Open Health Imaging Foundation, Open Street Map, Papaya, Pathway diagrams, Pileup.js, Polar Geospatial Center, Potree, Protein Data Bank (PDB), PubMed, Shadertoy, ShareLaTeX, SizzLine, Skype, Slack, SlideShare, Smelly Maps, SuAVE, Terrafly, The Climate Explorer, Tinkercad, United States Census - DataViz, USGS latest earthquakes map+data, VTK.js, Weather underground, Worldwide Telescope html5 version

SAGE2 v3 - Waipiʻo

Integration with Scientific Workflows

Jupyter

Jupyter

Andrew Burks (UIC)

- **Jupyter** is becoming a popular data science platform
- **JupyterLab** aims to build on **Jupyter Notebooks** to provide a powerful, <u>extendable</u> interface

- We provide an extension to **JupyterLab** to integrate **SAGE2** into Jupyter-based data science workflows

[http://jupyter.org]

www.sagecommons.org

SAGE2™

Scalable Amplified Group Environment

User Interface Improvements

Voice Commands
Remote Pointers

Voice Commands

- Users can control SAGE wall and applications like Siri.

- Three types of commands:
- Wall
  – Tile content, launch application, restore session
- Application
  – Maximize, share, context menu entries
- User Interface
  – Time, help

Dylan Kobayashi
UH Manoa

Scalable Amplified Group Environment

Remote Pointers

Improves distance collaboration by enabling remote users to simultaneously point at things in shared documents.

Scalable Amplified Group Environment

Management Capabilities

Cloud-based Installation
Performance Monitoring

SAGE2cloud

- Simplify SAGE2 deployment
  - One click SAGE2 server installation and configuration
  - Monthly SAGE2 version selector
  - One-click updater
  - Support for multiple users and machines

- Provide a scalable environment for deploying and managing multiple SAGE2 servers
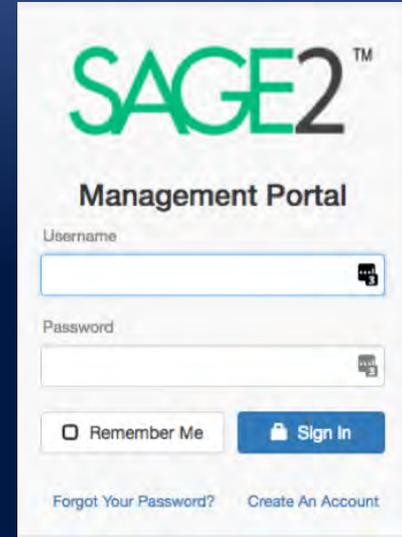
Victor Mateevitsi, UIC

SAGE2cloud Implementation

Single Machine

Multiple Machines

Scalable Amplified Group Environment

SAGE2 Performance Monitoring

Performance monitoring tool to monitor the general "health" of the SAGE2 system- to quickly pinpoint the cause of bottlenecks.
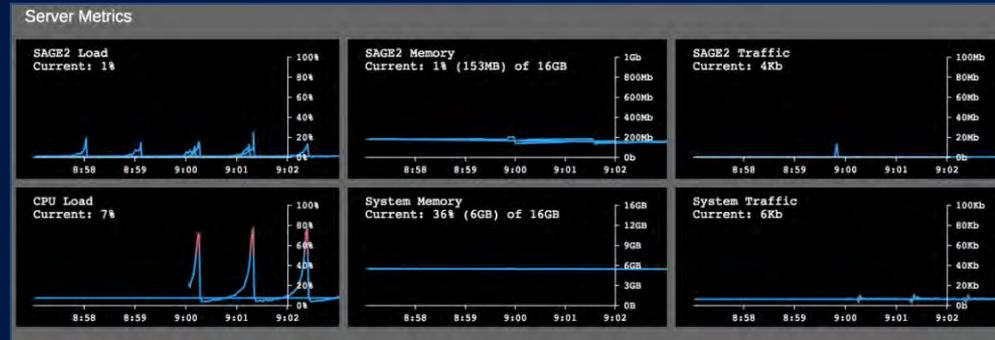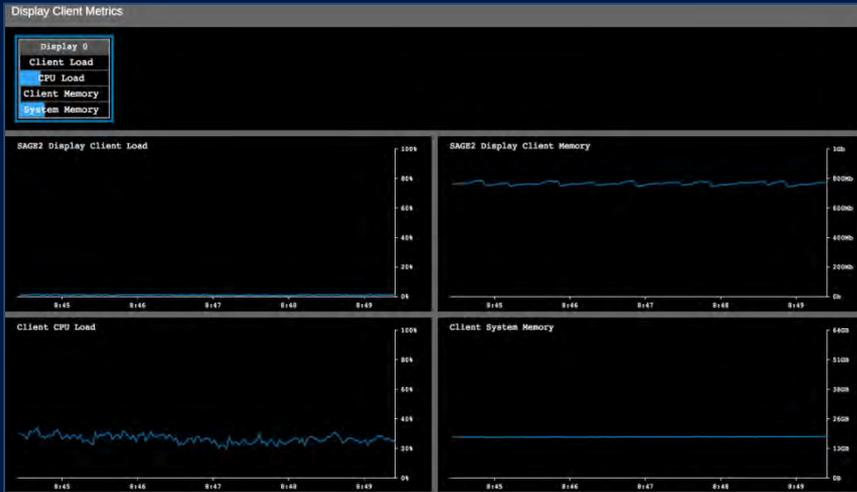
Krishna Braradwha,
UIC

www.sagecommons.org

Application Development

Synchronized Movieplayer
Chemistry Viewer
Notepad
Unity3D

Synchronized Movie Control

Control of multiple video players together to allow synchronized views of pre-rendered scientific visualizations.

Thank you National Center for High Performance Computing (Taiwan) for the idea and feedback.

Dylan Kobayashi
UH Manoa

SAGE2™

Scalable Amplified Group Environment

ChemViewer Updates

Expanded to show information from
http://www.ebi.ac.uk/chebi/

Jared McLean
UH Hilo

Notepad Update

Now supports text scrolling

Jirayu Roungsuriyaviboon
Mahidol University,
Thailand

Unity WebGL in SAGE2

Framework to allow developers to create Unity applications and use SAGE2 to display the application at the full resolution of the display wall
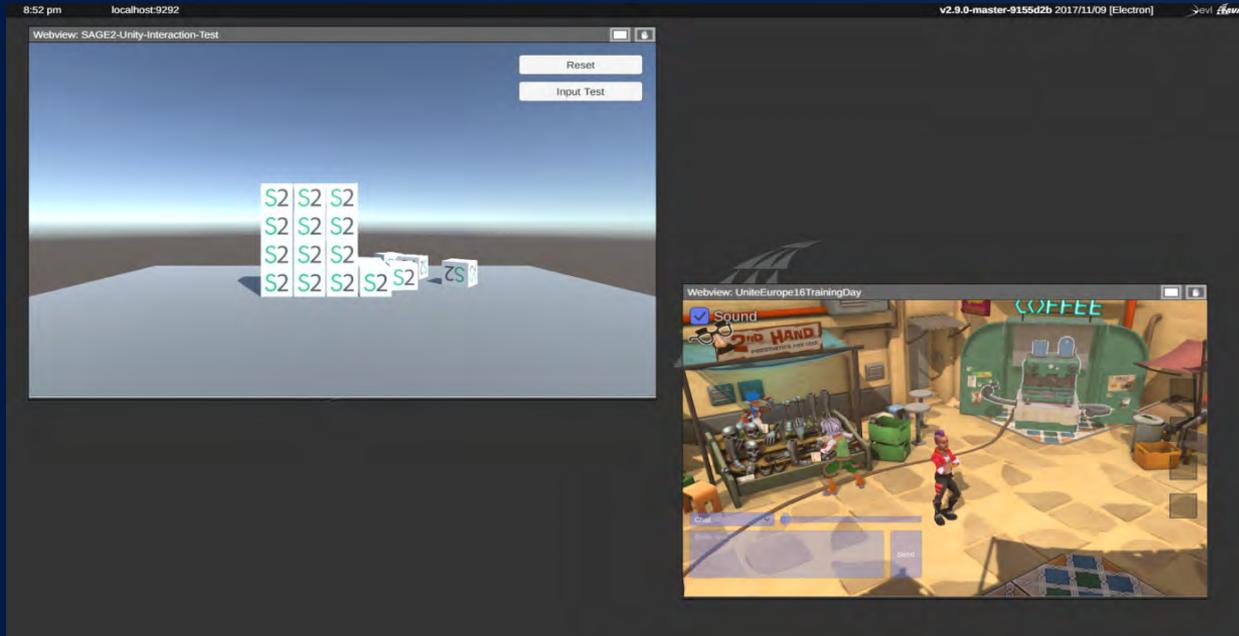
Arthur Nishimoto
UIC

www.sagecommons.org

Under Development

User Access Control
Application Data Sharing

User Access Control

- ## Distinguish between people using SAGE2
  - Access and authorization
  - Log activity—who did what
  - Scenarios and roles, e.g.
    - Group meeting with a leader
    - Teachers / students

Kristine Lee, UIC

User Access Control
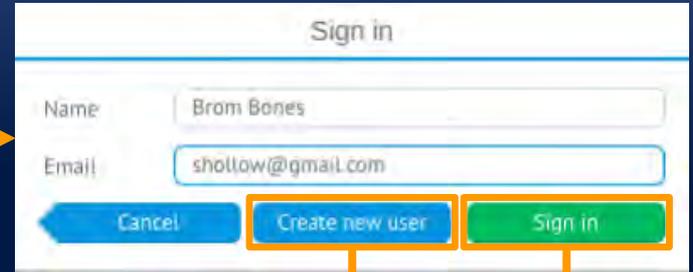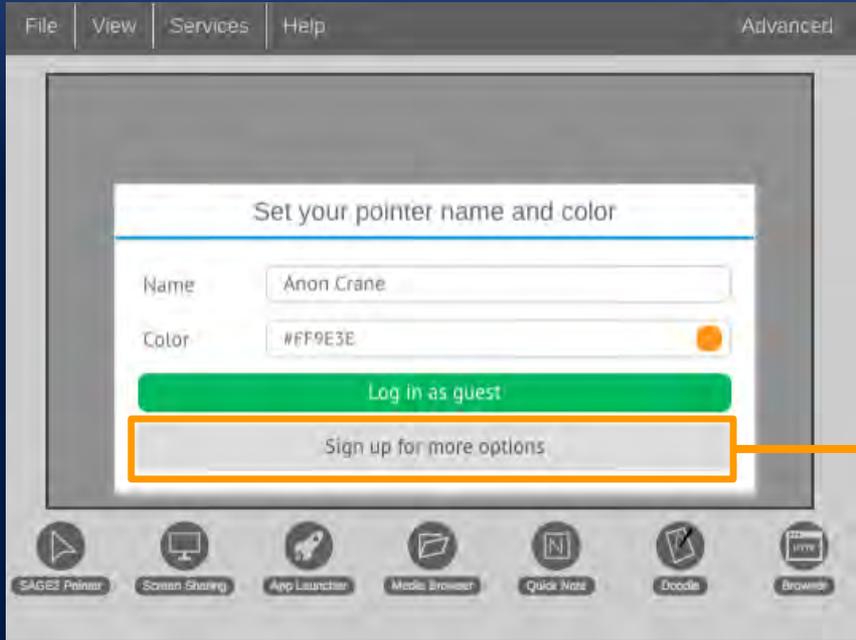
Anonymous guests are prompted to log in

User Access Control
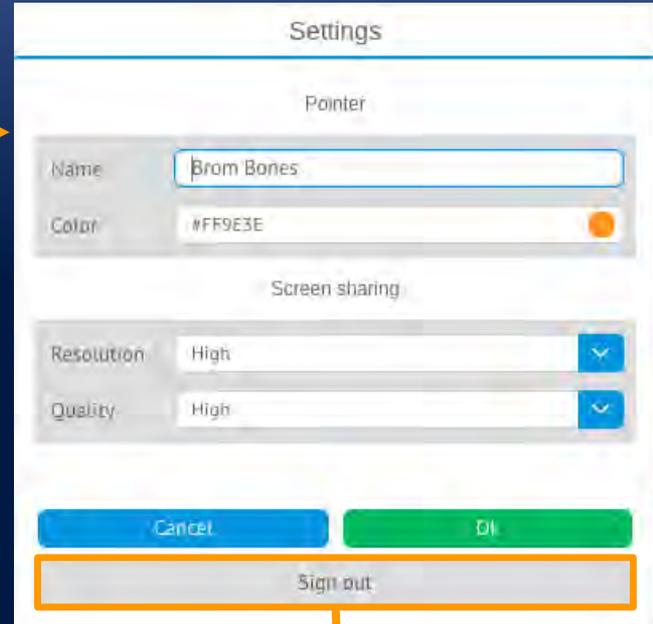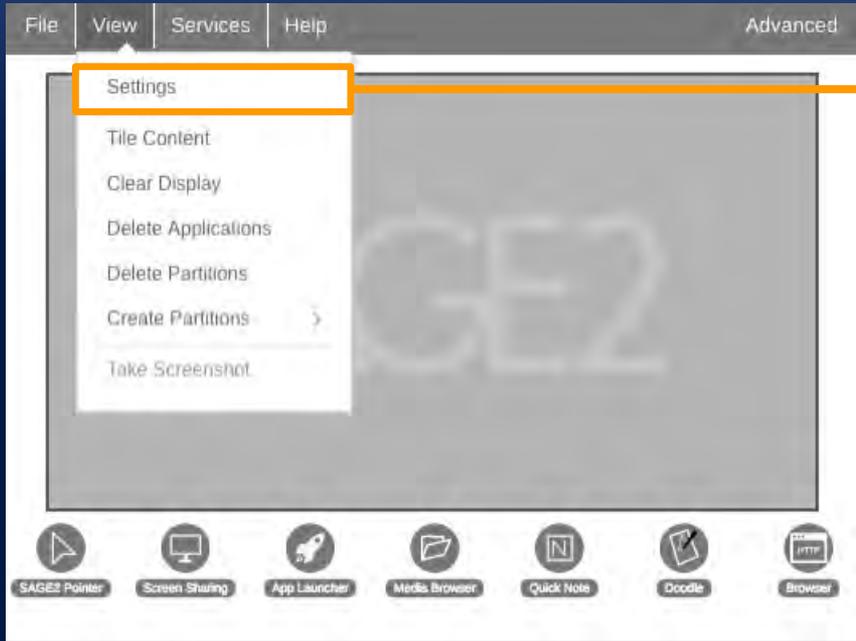
User can also sign in/out in View > Settings

Sign out

User Access Control

Open the User Console via the Advanced menu

See who's connected

Manage roles and permissions

User Access Control

Example scenario: only the teacher (admin role) has permission to use the wall
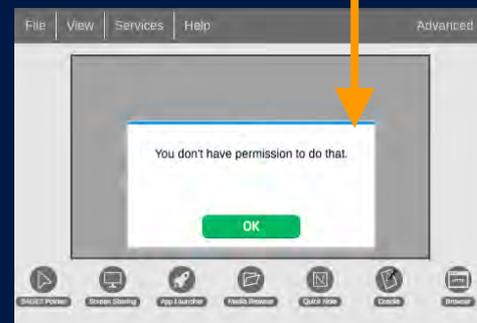
Actions by unauthorized users are disabled

SAGE User Access Model
Next Features

- Secure authentication
  - Currently using username/email as login keys
  - Integrate Passport/Express
- Authorized access to user console
- Extended role creation
  - Currently limited to admin/user/guest

Application Data Sharing

- Data sharing was added to SAGE2 application API to allow multiple applications to work as one large application
- Also enable applications to be designed like components that other developers can utilize
- Applications are able to launch other applications
- This allows not only data passing, but window manipulation

Dylan Kobayashi (UHM),
Jason Haga (AIST)

SageRDI

Sage River Disaster Information

Laboratory for Advanced Visualization & Applications
University of Hawai'i at Mānoa

lava.hawaii.edu

SAGE2 v3 - Waipiʻo

- Available now!!!!
- Download Windows binary
- Standalone binaries for Display and UI clients available
  - Windows, macOS, Linux
- Install scripts for major Linux distribution
- Docker image on Docker Hub
  - https://hub.docker.com/r/sage2/master/

Documentation
http://sage2.sagecommons.org/instructions/

- Installation documentation

- New features in V3

- Introduction to SAGE2

- User Interface walkthrough

- SAGE2 Security

- Mouse and keyboard operations and shortcuts

- Voice commands

- Developer documentation

- SAGE2 code and API

- Command line operation

SAGE2 @ SC17

Center for Data Intensive Science Booth 1653
AIST Booth 1211
SCinet

For Help

- Web
  - sagecommons.org
- Google group
  - https://groups.google.com/forum/#!forum/sage2
- Slack
  - sage2.slack.com

Thank You

NSF #OAC-1441963 SAGE2   NSF #OAC-1450871 StarLight SDX
NSF #OAC-1550126 CENTRA   NSF #CNS-1530873 MRI CyberCANOE