Birds of a Feather Meeting
2017
Laboratory for Advanced Visualization & Applications
University of Hawai‘i 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

SAGE BOF 2017
SAGE2 Community Update
<table>
<thead>
<tr>
<th>SAGE2 User Community 2017</th>
<th>84 Sites: 42 International + 42 National</th>
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<td><strong>AUSTRALIA</strong></td>
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<td>• University Southern Queensland</td>
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<td><strong>BRAZIL</strong></td>
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<td>• Federal University Paraíba, LAVID</td>
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<td>• Federal Univ. Rio Grande do Sul</td>
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<td>• Mackenzie University, LabCine</td>
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<td>• National Institute of Space Research</td>
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<td>• RNP, Rio de Janeiro (2)</td>
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<td>• University of Campinas, Cinema</td>
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<td>• University of Sao Paulo, LARC</td>
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<td>• University of Sao Paulo, LASSU (2)</td>
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<td><strong>CANADA</strong></td>
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<td>• Ciena Research Labs</td>
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<td>• Simon Fraser University, IRMACS</td>
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<td><strong>CHINA</strong></td>
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<td>• Tianjin University of Technology</td>
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<td><strong>CZECH REPUBLIC</strong></td>
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<td>• CESNET and Czech Technical University, SAGElab</td>
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<td>• CESNET, Mobile SAGE</td>
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<td>• Masaryk University, Cyber-Exercise &amp; Research Platform Proj.</td>
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<td>• Masaryk University, Lab of Adv. Networking Technologies (2)</td>
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<td>• Mavenir, Network Ops Center</td>
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<td><strong>ITALY and SWITZERLAND</strong></td>
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<td>• University Urbino and ETH Zürich</td>
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<td><strong>JAPAN</strong></td>
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<td>• National Institute of Advanced Industrial Science &amp; Technology (2)</td>
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<td>• NTT Network Innovation Labs</td>
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<td>• Osaka Univ., Cyber Media Center</td>
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<td><strong>KOREA</strong></td>
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<td>• Gwangju Institute of Science &amp; Tech</td>
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<td><strong>NETHERLANDS</strong></td>
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<td>• Air France-KLM, CIO Tech Office</td>
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<td>• SURFsrara, Collaboratorium</td>
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<td>• University of Amsterdam, SNE</td>
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<td>• University of Cape Town, Informatics and Visualisation Lab</td>
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<td><strong>TAIWAN</strong></td>
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<td>• National Center for High-performance Computing</td>
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<td>• National Chung Hsing University</td>
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<td><strong>UNITED KINGDOM</strong></td>
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<td>• Imperial College London</td>
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<td><strong>UNITED STATES</strong></td>
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<td>• Adler Planetarium</td>
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<td>• Argonne National Laboratory, ALCF</td>
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<td>• Caterpillar Inc.</td>
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<td>• Catherine Cook School</td>
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<td>• Chaminade University of Honolulu</td>
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<td>• Digital Manufacturing and Design Innovation Institute (DMDII)</td>
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<td>• Hawaii State Energy Office</td>
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<td>• Jackson State University, ECE</td>
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<td>• Kamehameha School</td>
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<td>• NASA Marshall Space Center, SpoRT</td>
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<td>• Northwestern University, iCAIR</td>
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<td>• Stanford University, HIVE</td>
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<td>• Univ. of Florida Gainesville, ACIS</td>
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<td>• University of Hawai‘i at Hilo (3)</td>
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<td>• Univ. of Hawai‘i Mānoa, C-MORE</td>
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<td>• University of Hawai‘i Mānoa, HIGP</td>
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<td>• University of Hawai‘i at Mānoa, Information Technology Center</td>
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<td>• University of Hawai‘i Mānoa, i-LAB</td>
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<td>• Univ. of Hawai‘i at Mānoa, LAVA (3)</td>
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<td>• University of Hawai‘i at West Oahu, Academy for Creative Media</td>
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<td>• University of Illinois Chicago, ACM/LUG Student Chapters</td>
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<td>• University of Illinois Chicago, Comm.</td>
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<td>• Univ. of Illinois Chicago, EVL (5)</td>
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<td>• University of Illinois Chicago, Maker Space</td>
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<td>• University of Illinois at Chicago, Innovation Center</td>
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<td>• Univ. Illinois Chicago, Ophthalmology</td>
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<td>• Univ. Illinois Chicago, Pathology (2)</td>
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<td>• Univ. Illinois Urbana-Champaign, NCSA</td>
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<td>• University of Maryland, Baltimore County, ARC</td>
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<td>• University of Oregon</td>
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<td>• Univ. of Pennsylvania, Idea Factory</td>
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</table>
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
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](http://bit.ly/2z2vAYg)
What type of content is displayed on your wall?

65 responses

- Astronomy: 16 (24.6%)
- Bioscience: 18 (27.7%)
- Computer Science: 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%)
- Communications: 1 (1.5%)
Desired Future Features

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

- Software Def... 20 (33.9%)
- Video streaming 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

SAGE2 v3 - Waipiʻo
Integration with Scientific Workflows

Jupyter
Jupyter

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

- We provide an extension to **JupyterLab** to integrate **SAGE2** into Jupyter-based data science workflows
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
Scalable Amplified Group Environment
Remote Pointers

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

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 Rouncuryayaviboon
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
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

Create new user

Sign in existing user
User Access Control

User can also sign in/out in View > Settings

Sign out
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
• 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
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-1550126 CENTRA

NSF #OAC-1450871 StarLight SDX
NSF #CNS-1530873 MRI CyberCANOE