Birds of a Feather Meeting 2015

SAGE BOF 2015

www.sagecommons.org

Laboratory for Advanced Visualization & Applications
University of Hawai'i at Mānoa
Jason Leigh, Dylan Kobayashi

Electronic Visualization Laboratory
University of Illinois at Chicago
Maxine Brown, Luc Renambot, Lance Long, Tommy Marrinan, Arthur Nishimoto, Krishna Bharadwaj

Funding

- Began with NSF ITR (OptIPuter) grant in 2002.
- Supported with NSF STCI grant 2009-2013.
- New support with NSF SI2-SSI grant 2013-2018.
- Academy for Creative Media, University of Hawaii system

What is SAGE2?

SCALABLE AMPLIFIED GROUP ENVIRONMENT

SAGE2 User Community 2015

55 Sites: 32 International + 23 National

AUSTRALIA
- RMIT, (VX)Lab
- University of the Sunshine Coast, Mechanical Engineering (3)
- University Southern Queensland

BRAZIL
- Federal University Paraíba, LAViD
- Federal University of Rio Grande do Sul, PRAV
- 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

CZECH REPUBLIC
- CESNET and Czech Technical University, SAGElab
- CESNET, Mobile SAGE
- Masaryk University, Cyber Exercise & Research Platform Project
- Masaryk University, Laboratory of Adv. Networking Technologies (2)

ITALY and SWITZERLAND
- University Urbino and ETH Zürich

JAPAN
- NTT Network Innovation Laboratories, Yokosuka
- Osaka Univ., Cyber Media Center

KOREA
- Gwangju Institute of Science & Technology, Networked Computing Systems Lab

NETHERLANDS
- SURFsara, Scientific Visualization Group, Collaboratorium
- University of Amsterdam, SNE

NEW ZEALAND
- REANNZ

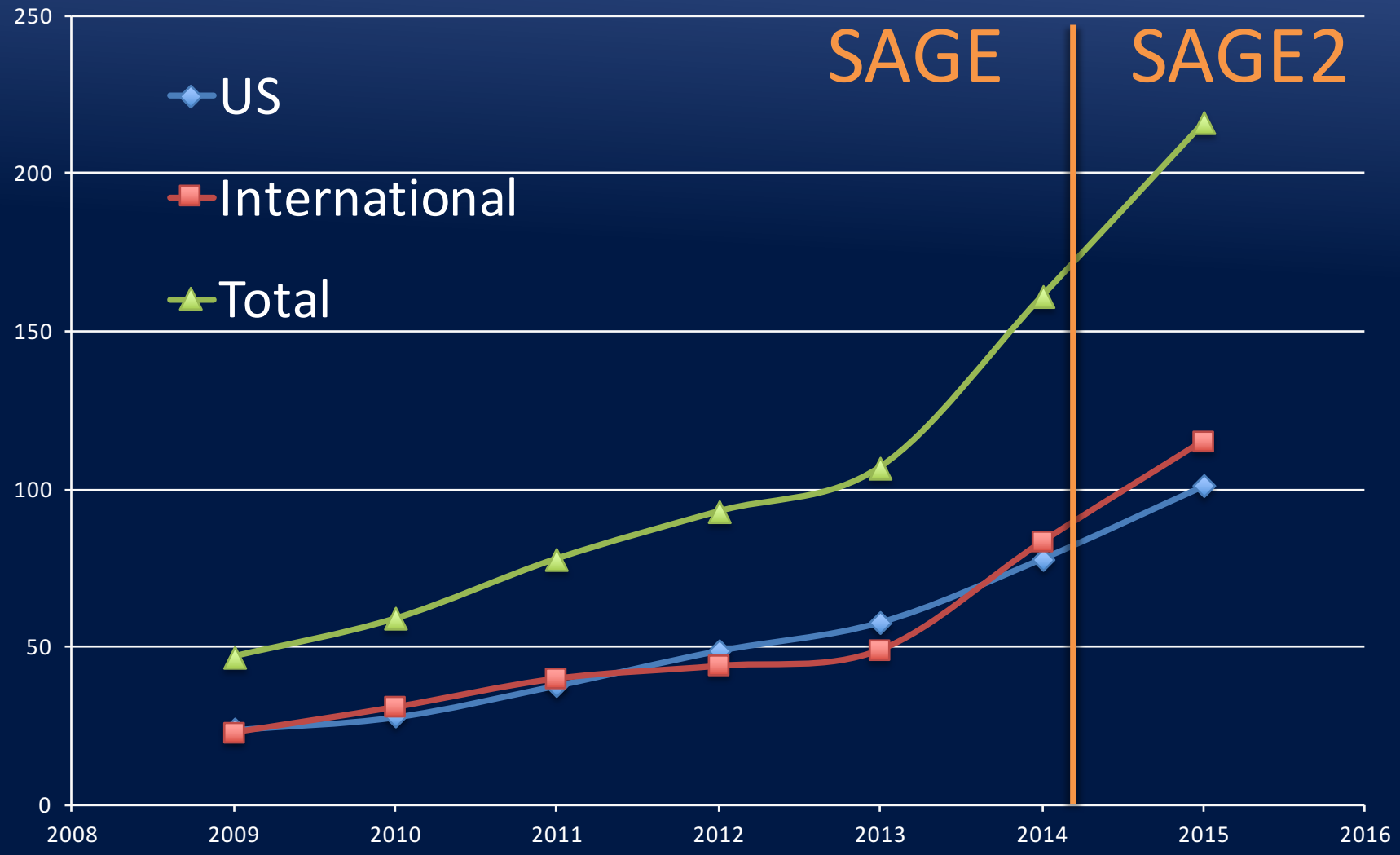
SOUTH AFRICA
- University of Cape Town, Informatics and Visualisation Laboratory

TAIWAN
- National Center for High-performance Computing

UNITED KINGDOM
- Imperial College London, Data Science Institute

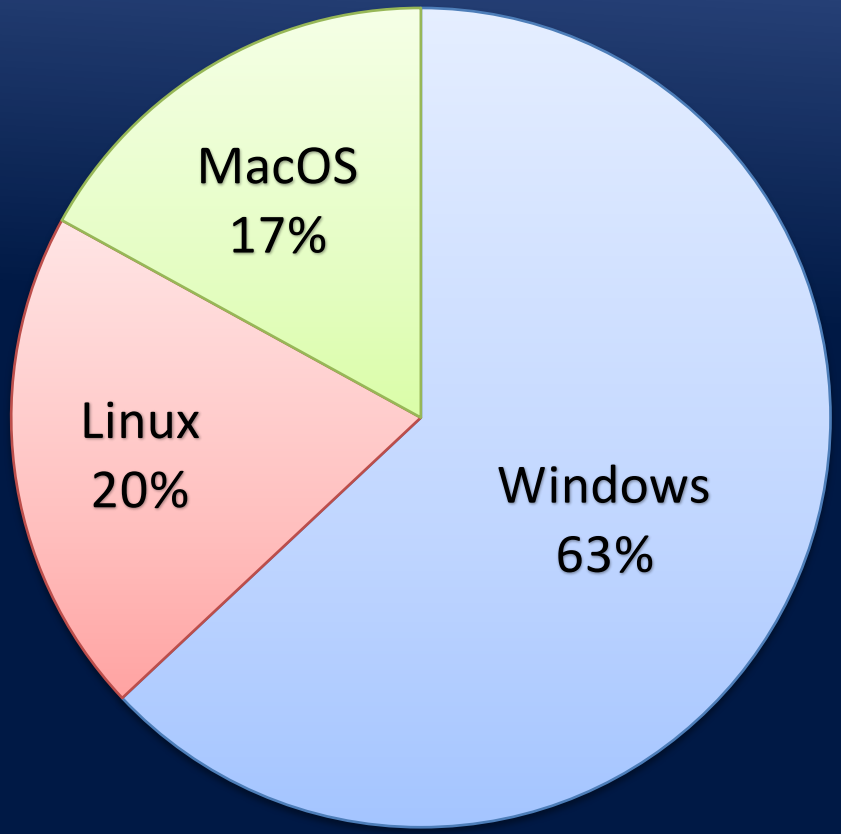
UNITED STATES
- Catherine Cook School
- Digital Manufacturing and Design Innovation Institute (DMDII)
- Jackson State University, ECE
- NASA Marshall Space Flight Center, SPoRT
- Northwestern University, iCAIR
- University of California, San Diego, Calit2-QI, VROOM
- University of Hawai'i at Mānoa, C-MORE
- University of Hawai'I Mānoa, HIGP
- University of Hawai'I Mānoa, i-LAB
- University of Hawai'i at Mānoa, LAVA (3)
- University of Hawai'I West Oahu, Academy for Creative Media
- University of Illinois at Chicago, ACM/LUG Student Chapters
- University of Illinois at Chicago, EVL (5)
- University of Illinois at Chicago, Ophthalmology
- University of Illinois at Chicago, Pathology (2)
- University of Illinois at Urbana-Champaign, NCSA

SAGE-SAGE2 Sites from 2009-2015



SAGE2 User Community 2015

- From November 2014
- 890 binary downloads
- Not counting sources download
- 32 registered developers
  - bitbucket.org/sage2
- 143 forum members
  - https://groups.google.com/forum/#!forum/sage2

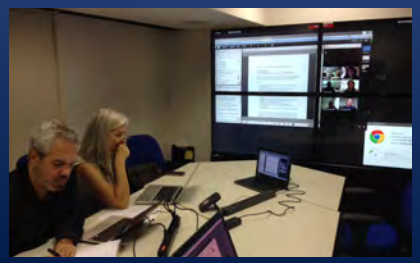


SAGE2 User Sites Examples

International

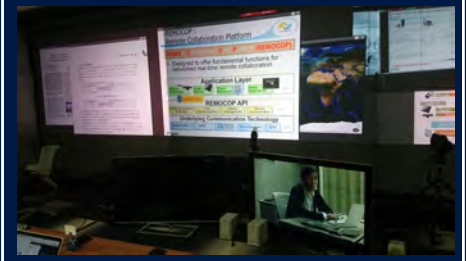
AUSTRALIA, RMIT Virtual Experiences (VX) Lab

BRAZIL, Mackenzie University, LabCine



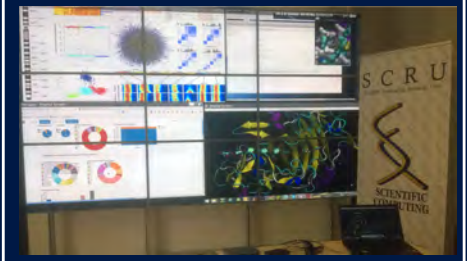
BRAZIL, RNP

CZECH REPUBLIC, Masaryk University, Lab. Adv. Networking Technologies

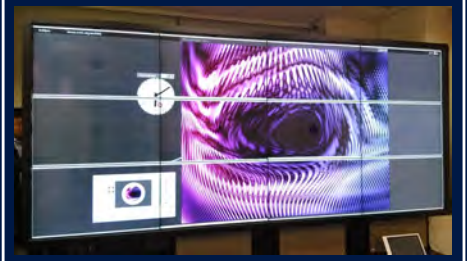


JAPAN, NTT Network Innovation Laboratories, Yokosuka

NEW ZEALAND, REANNZ



SOUTH AFRICA, Univ. Cape Town, Informatics and Visualisation Laboratory

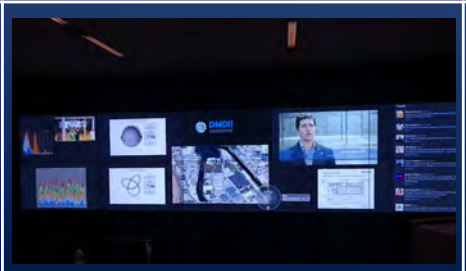


TAIWAN, National Center for High-performance Computing (NCHC)

SAGE2 User Sites Examples

National

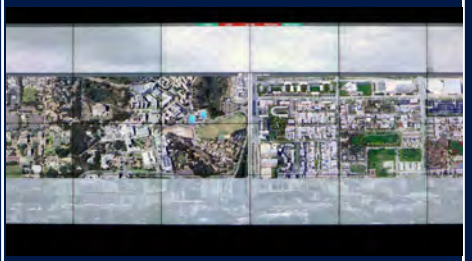
USA, Catherine Cook School



USA, Digital Mfg & Design Innovation Institute

USA, Jackson State University, ECE

USA, Northwestern University, iCAIR



USA, Univ California, San Diego, Calit2-QI, VROOM

USA, University of Hawai'i at Mānoa, Innovation Lab

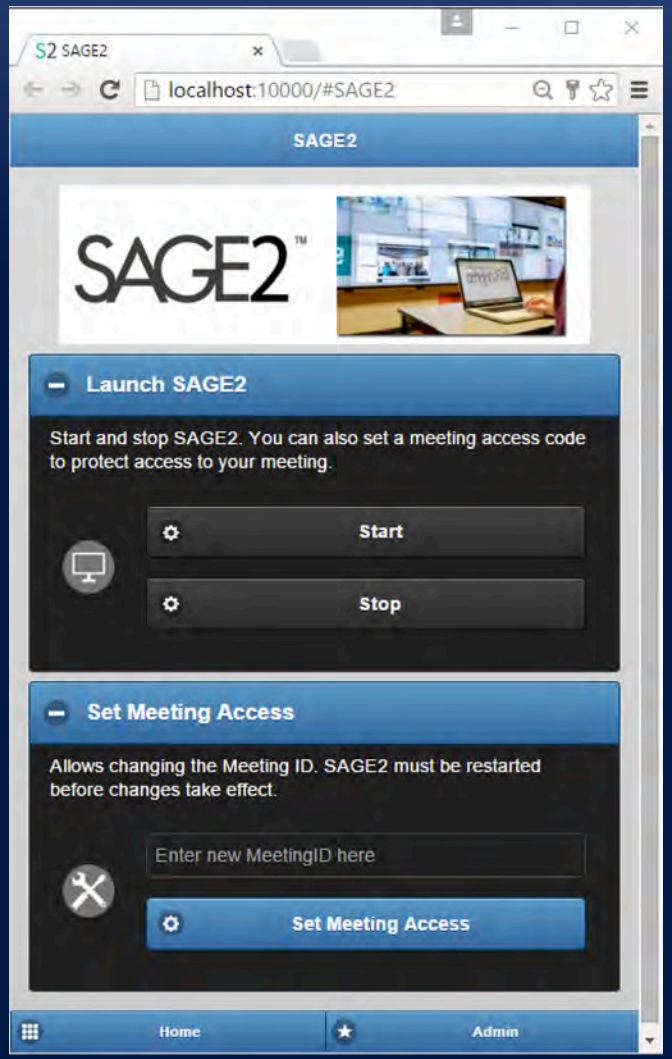
USA, University of Illinois Chicago, Ophthalmology

USA, University of Illinois Urbana-Champaign, NCSA

SAGE2 V1
Koʻolau

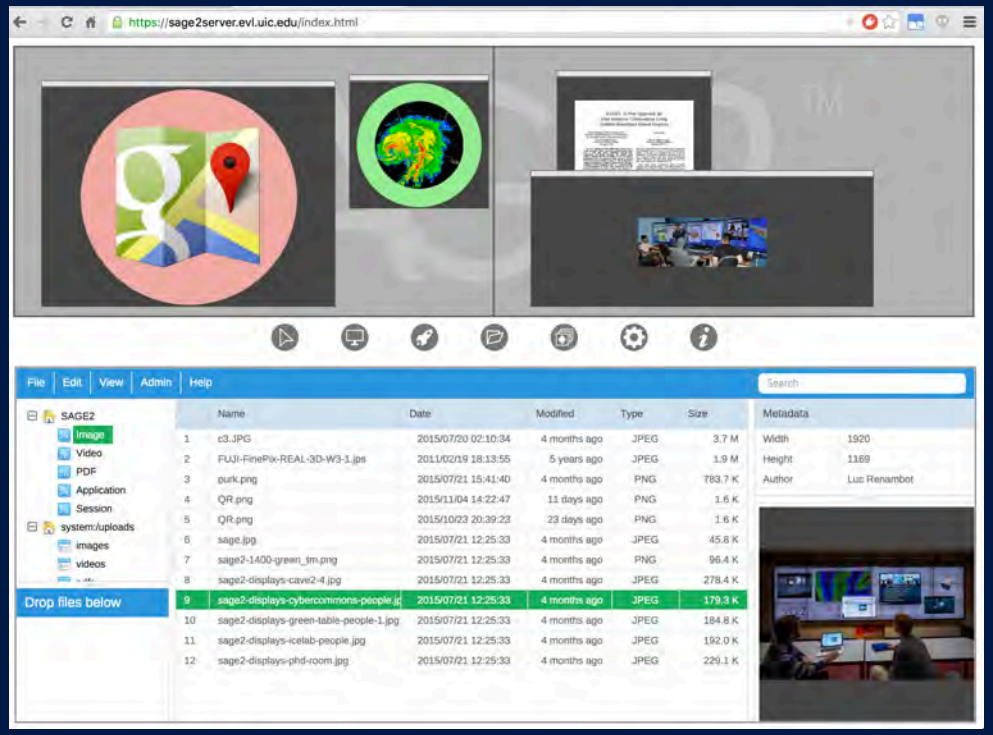
Ko‘olau NEW Features

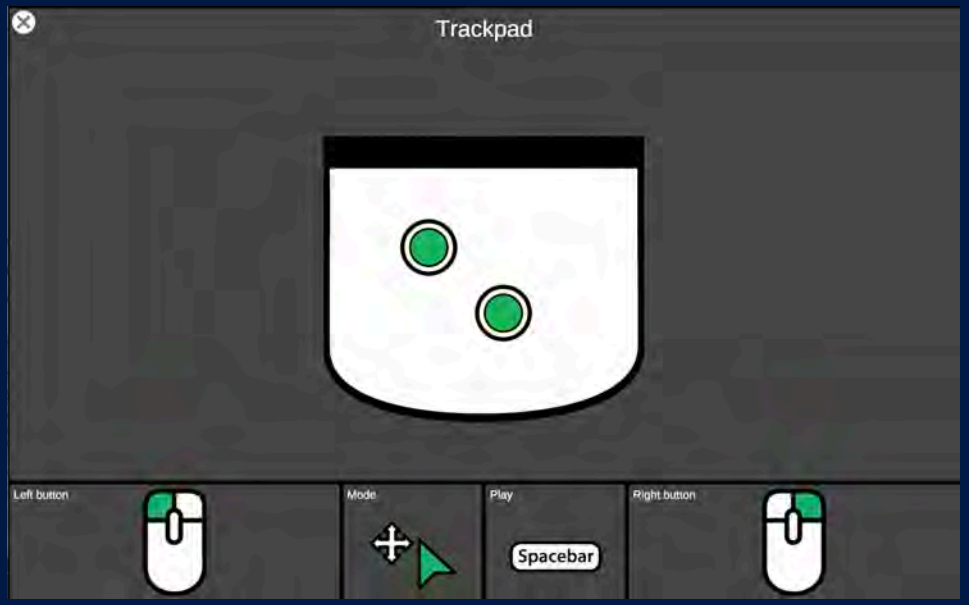
- Installer – all-in-one for Windows
  (add Chrome & stir)
- Easy Launcher – web interface, meeting participation id
- Shared application synchronization
- Improved WebGL support
- 3D image support
- Automatic user-interface resizing for wall size (beta)



Ko‘olau NEW Features

- Client Interface
  - File manager
  - Mobile





Ko‘olau NEW Features

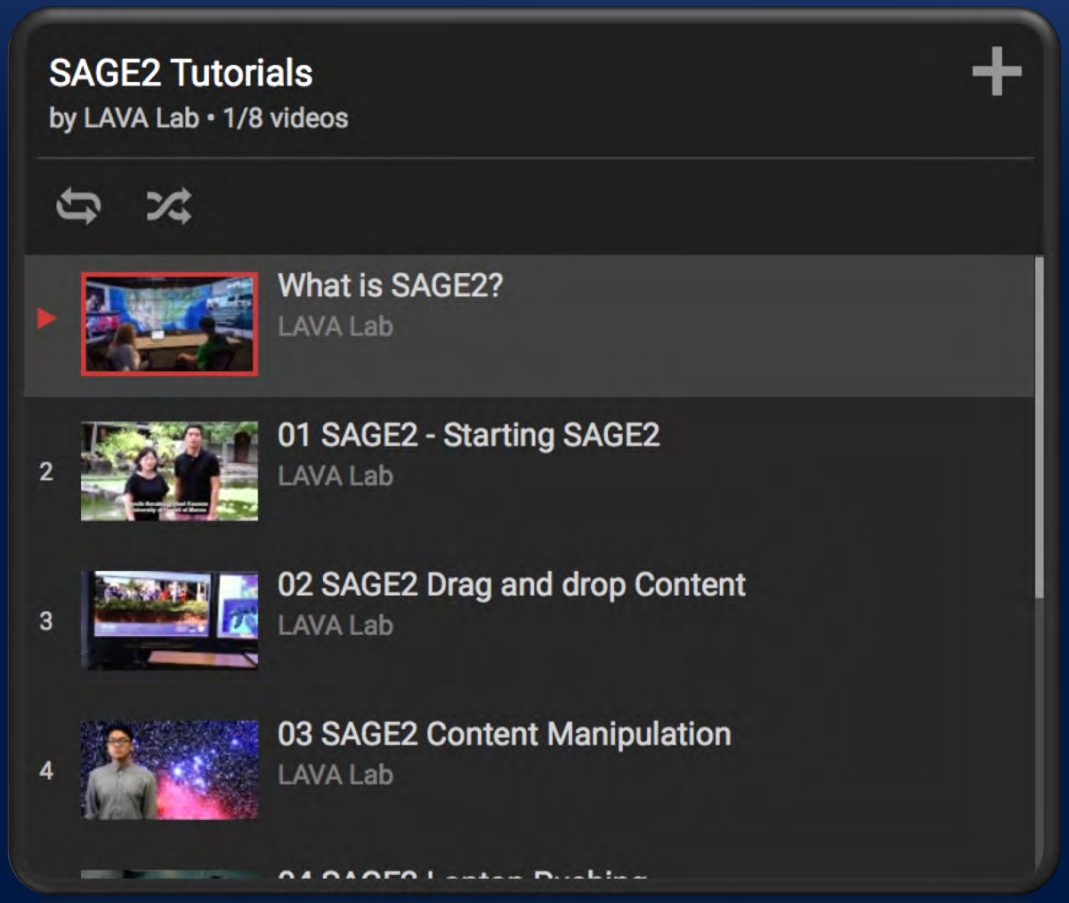
- Asset management
  - Multiple asset folders
  - Compatibility with Cloud providers- generally any folder-based synchronization technology

Dropbox

Google Drive

Documentation

- Manuals
  - Installation
  - Configuration
  - App. Developer
- Videos
  - How-to videos created by NSF REU students in Hawaii



SAGE2™

Starting and Connecting to Sage

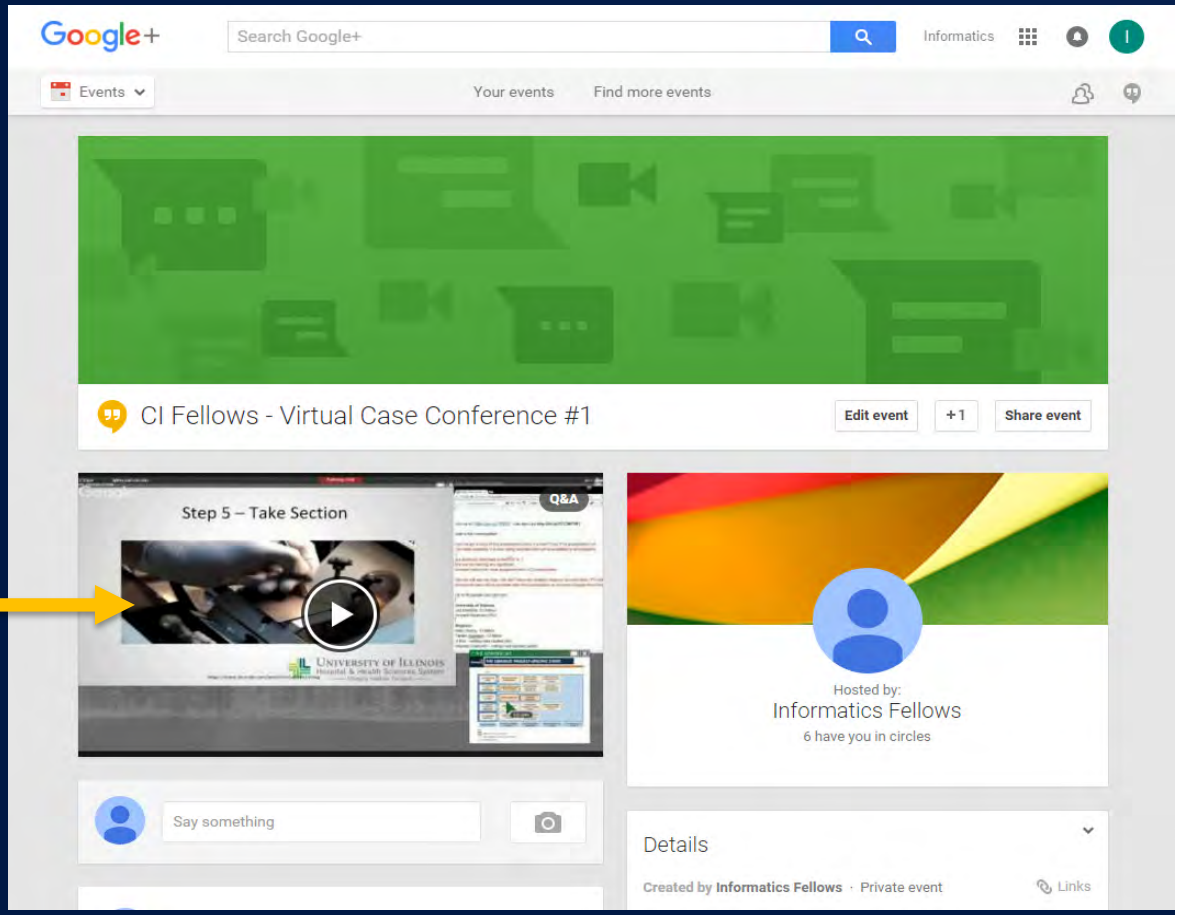
Use Cases

- Clinical Informatics
- RNP and Universities
- Ciena Vector Summit
- Osaka University
- CESNET SAGElab

Clinical Informatics (CI) – Virtual Case Conference

Bruce Levy and John Manning, UIC Pathology

- National online conference
  - 13 CI fellowship programs (from CA to MA)
  - 50 attendees (fellows + faculty)
- Format
  - SAGE2 Wall
  - Hangouts on Air
  - YouTube video (private link)



Courtesy John Manning

University of Illinois Hospital & Health Sciences System
Changing medicine. For good.

SAGE BOF 2015

Clinical Informatics (CI) – Virtual Case Conference

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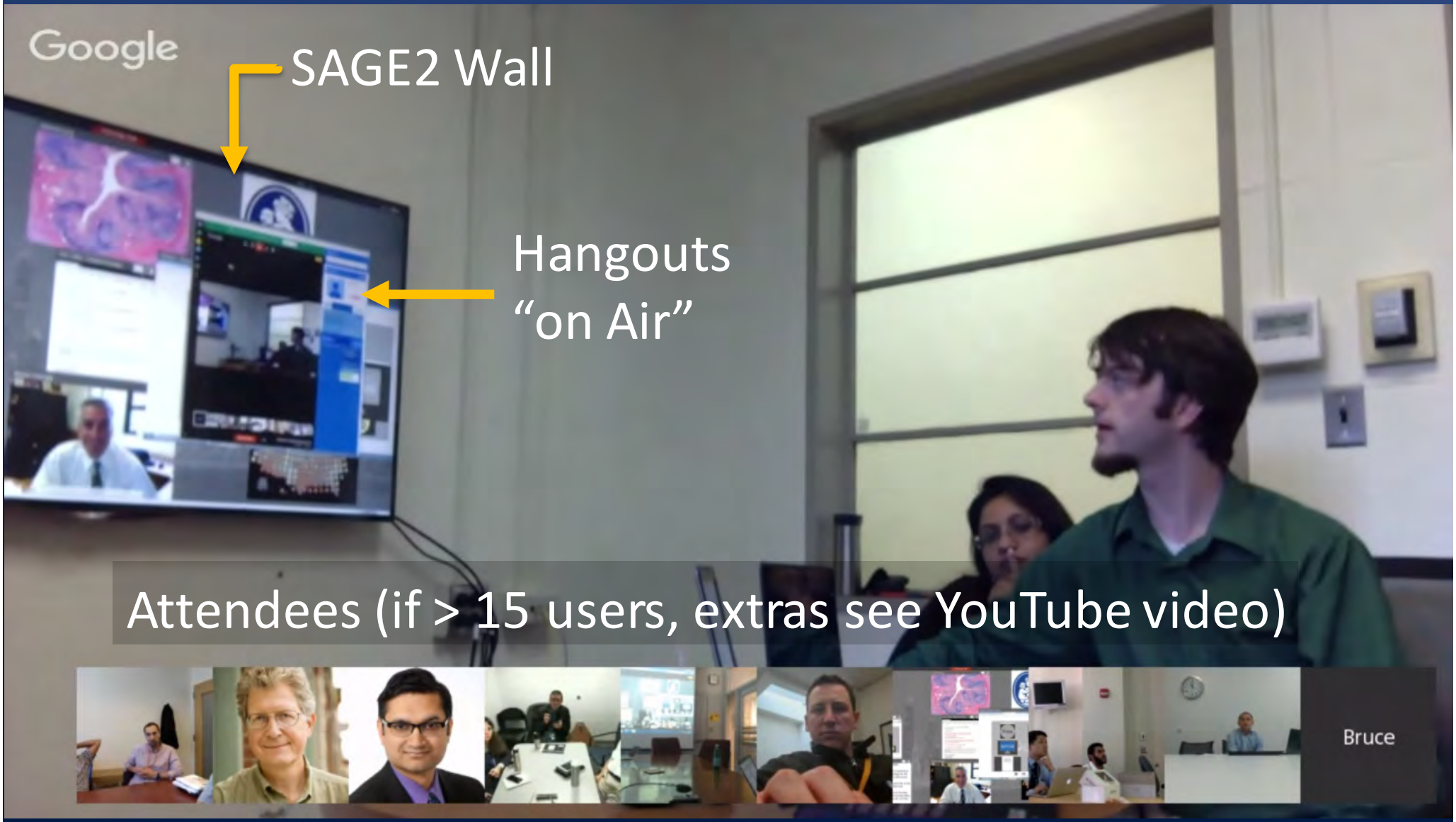

Clinical Informatics (CI) – Virtual Case Conference

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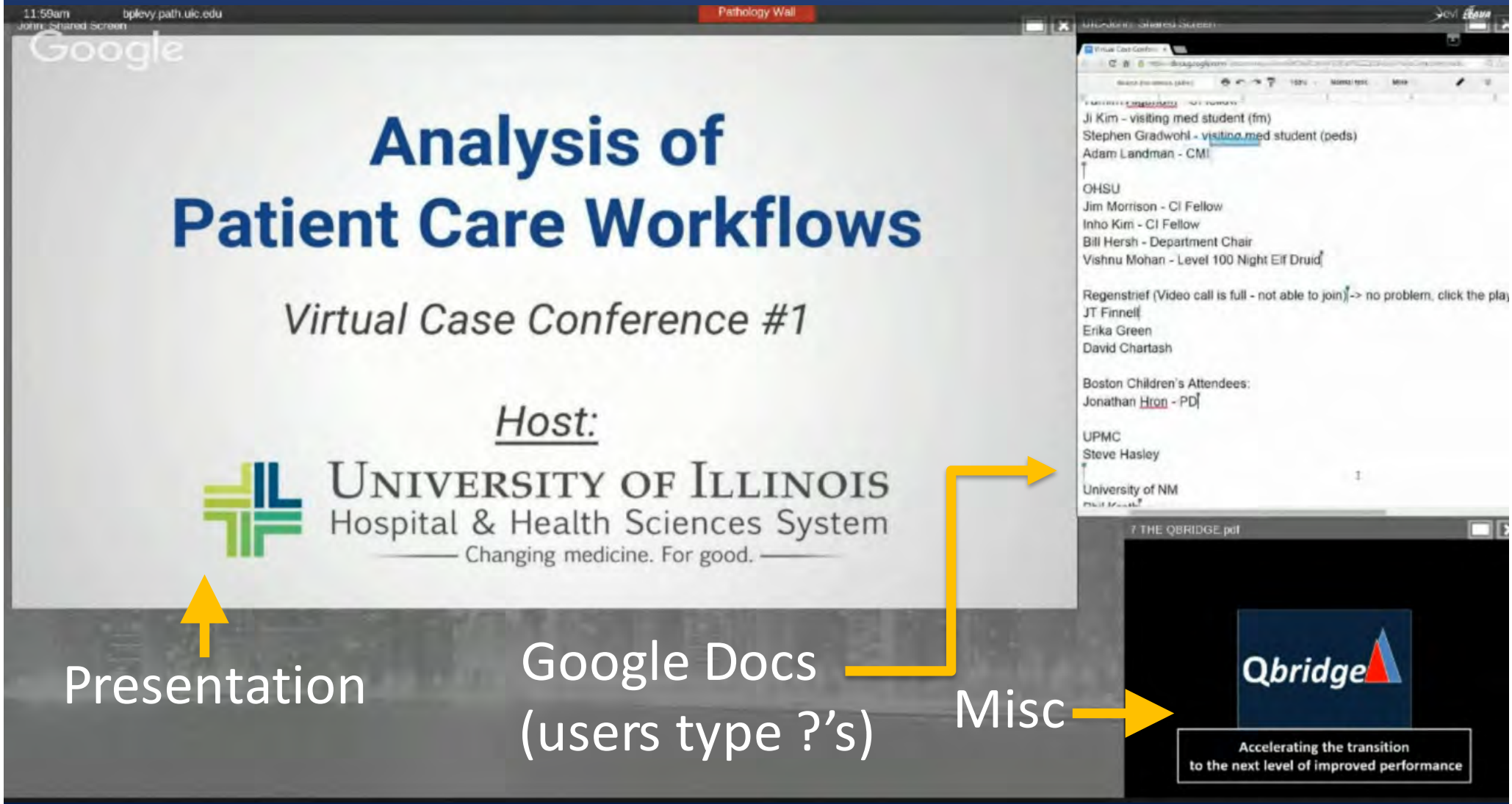


RNP and University of São Paulo, Brazil

SAGE2 Installfest – April 2015

Technical people from all Brazilian SAGE sites learn to install and configure SAGE2. Each "student" brought a hard drive from their SAGE2 server, which was placed in a machine of equal specification.

Courtesy Leandro Ciuffo

RNP and University of São Paulo, Brazil

Brazilian Symposium on Computer Networks and Distributed Systems – May 2015

SAGE BOF 2015

Courtesy Leandro Ciuffo

www.sagecommons.org

Ciena Vector Summit

Chicago, Canada, Amsterdam ExoGENI Demo – May-June 2015

Using ExoGENI/SDN technologies, a single slice was provisioned on the UvA ExoGENI rack, where a slice is defined as a virtual machine (VM) interconnected via a dedicated private network and accessible from a public internet address – the VM ran the SAGE2 server. Ciena participants could open a Chrome browser on their laptops to the public address of the VM and drag and drop content or share their desktop to the tiled display, in addition to manipulate content already on the display, all through the SAGE2 server in Amsterdam.

UIC/EVL, Northwestern/iCAIR, Ciena Research, University of Amsterdam (UvA)

Courtesy Cees de Laat

Osaka University

PRAGMA 28 (Osaka) SAGE2 Presentations – April 2015

SAGE2 used in several demonstrations by Osaka University: disaster mitigation by real-time analysis of TSUNAMI using federated supercomputers, meteorological big data visualizations, and a collaborative demo with NCHC, Taiwan.

Courtesy Weicheng Huang

Osaka University and Tohoku University

Remote Lectures Using SAGE2 to Share Slides and Video – Aug 2015

Courtesy Shinji Shimojo

SAGElab : CESNET, Czech Republic

GLIF Meeting, Prague – September 2015

Courtesy Maxine Brown

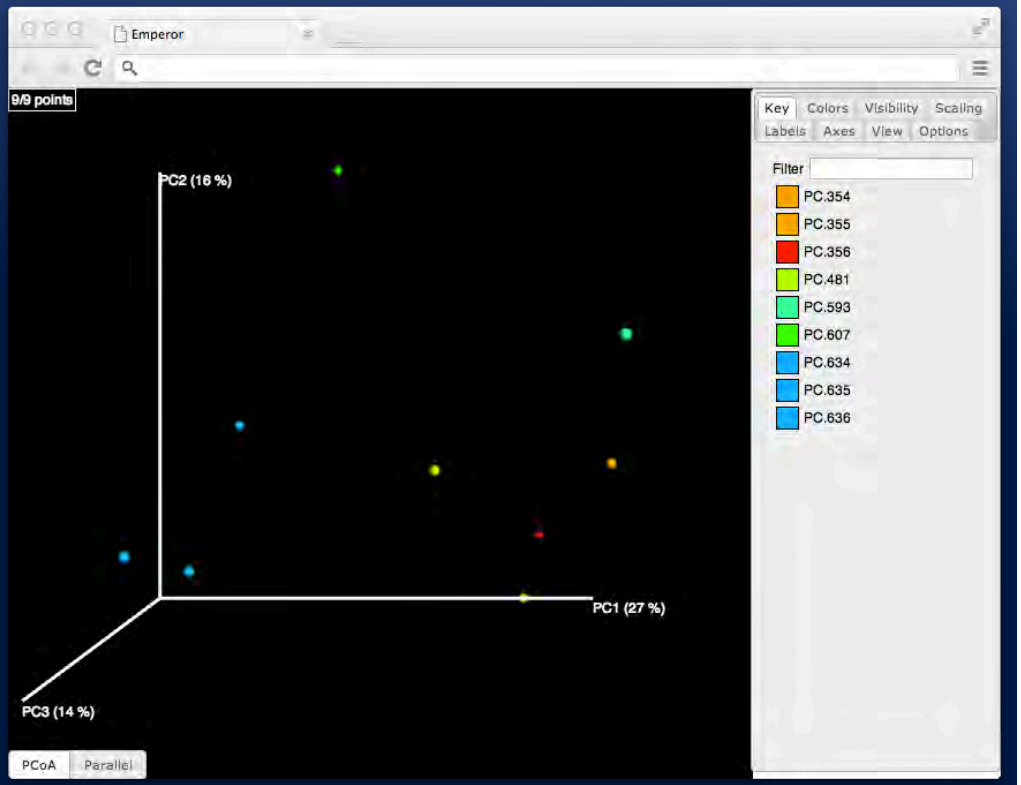
Future Plans

- Application repository for contributors
- Domain-specific tools
  - Bioinformatics: BioJs, CytoScape, Emperor, …
  - Chemistry: ChemDoodle, ...
  - Geoscience: cesiumjs, webglearth, openLayers, …
  - Information: D3, NVD3, C3, JIIT, …
  - Scientitic: ParaviewWeb, IPython, Jupyter, …
  - Network: perfSonar, vis.js, …
- Shared portals (currently beta)
- Post-it and annotations (currently beta)
- Collaborative whiteboard (alpha)

Emperor Integration (in progress)

UC San Diego, Calit2-QI

- Emperor is an interactive next-generation tool for the analysis, visualization and understanding of high-throughput microbial ecology datasets.
- Its tailor-made graphical user interface makes it easy to delve into a new dataset to elucidate patterns hidden in the data.
- Python with Web output using **WebGL** and **HTML** user interface.



EMPEROR

CESNET and Czech Technical Univ, Czech Republic

SAGE2 Extension for Mobile Devices – In Development

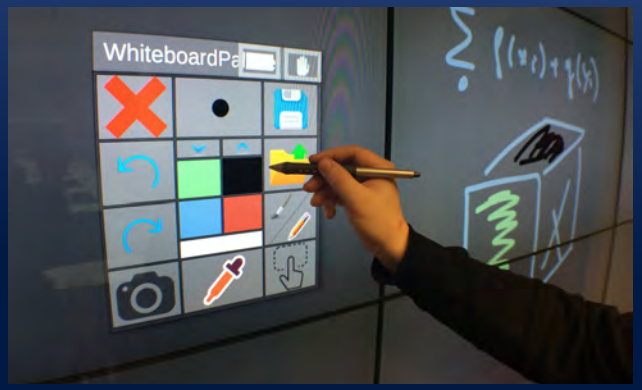
SAGE BOF 2015

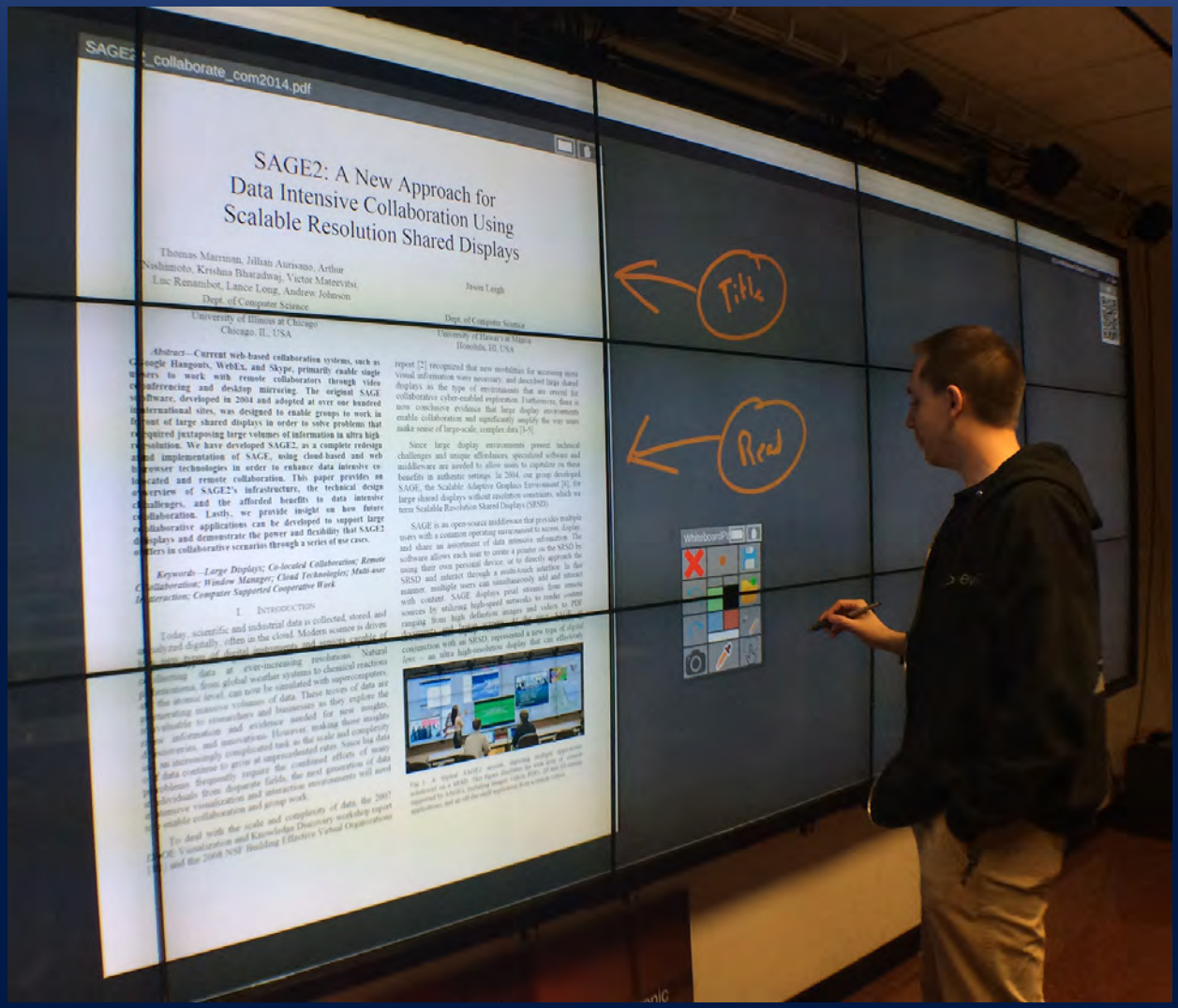
Developed by Jiri Kubista

www.sagecommons.org

Whiteboard Application

University of Illinois at Chicago – Class Project





And more to come …

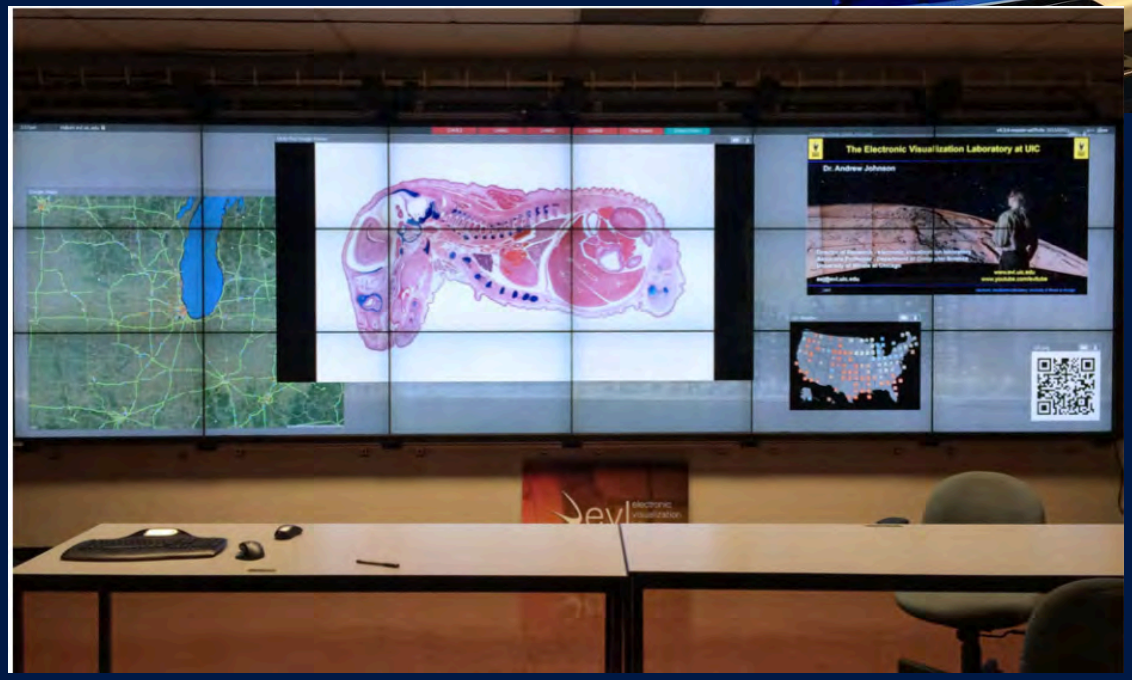
- Open-Scenegraph JS: Garry Keltie, Australia
- Better WebGl: Garry Keltie
- VNC: Michal Hečko (Czech), Ian Peake, RMIT- Australia
- Scripted images: Bernard Meade, University of Melbourne
- Content Espresso Media Distribution: Daisuke Ando, Keio U
- RemoCop collaboration: Daisuke Shirai, NTT Network Innovation Lab
- Stereo 3D graphics: Simon Orsborn, University of the Sunshine Coast
- Birch Aquarium: Joe Keefe, UCSD
- Network monitoring and visualization: John Graham at UCSD

Wall Construction Guides

- Small
  - Laptop, RaspberryPI, Nvidia TX1
  - Node.js popular on IoT platforms
  - Anything with a decent browser
    - Limitation: memory

Wall Construction Guides

- Medium
  - Cyber-Commons
  - CyberCANOEs



- Single Gaming PC
  - Several screens

Wall Construction Guides

- Large
  - LAVA
  - CAVE2

- Many screens
- Cluster might be required

Wall Construction Guides

- http://sage2.sagecommons.org/2015/09/01/upgrading-evl-18-screen-wall-to-a-single-pc/

Upgrading EVL's 18-screen wall to a single PC

This summer, EVL updated their classroom wall computer. Here is a short report about it (PDF version: single-pc-report).

SAGE2 on a 18-screen display with one PC

Luc RENAMBOT and Lance LONG

Come see Ko‘olau on Showfloor - NCSA

Booth 1733

2 x 65” 4K OLED Displays

Meanwhile in Cees de Laat's hotel room…