

2015

# CURVE: A Look Back on the First Year

Georgia State University Library

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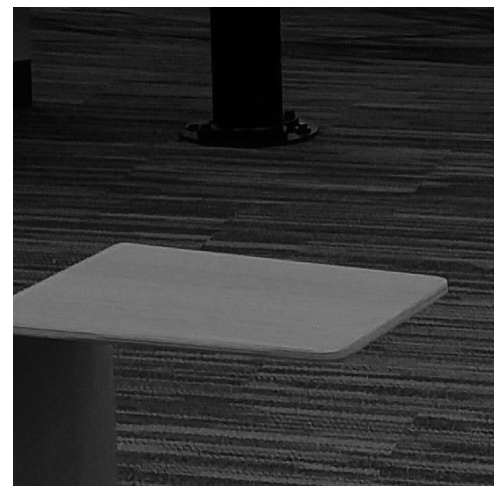
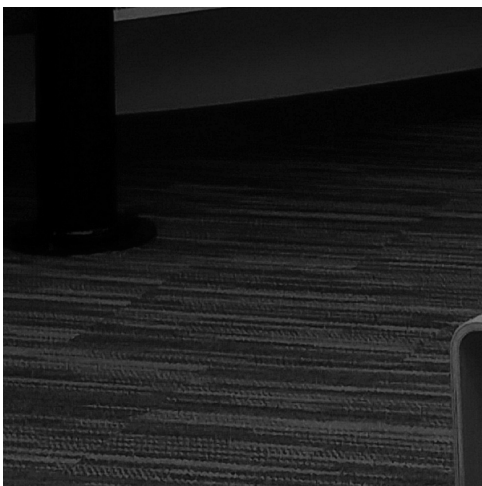
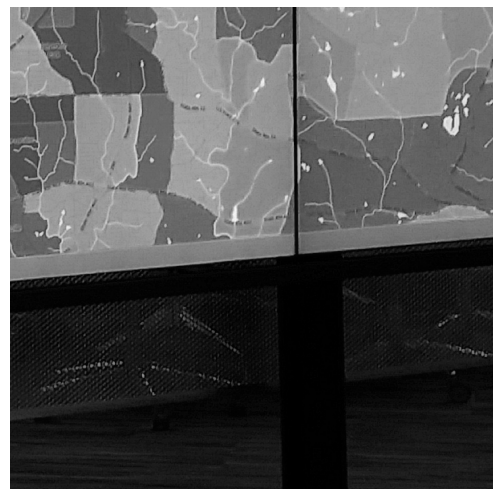
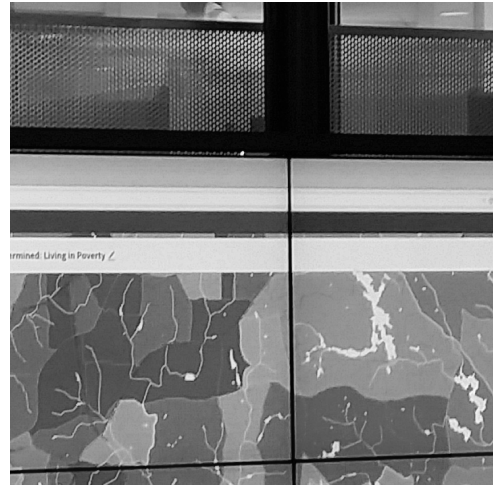
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45.2 2008 - 2012 15 Year Estimate - Population under 15 years of age for whom poverty...

# CURVE

a look back on the first year





## something new

**CURVE**, Collaborative University Research and Visualization Environment, is a new type of digital scholarship and data visualization center from Georgia State University Library, working in collaboration with campus partners.

CURVE's mission is to enhance research and visualizations by providing technology and services that promote interdisciplinary engagement, collaborative investigation, and innovative inquiry.

In its first year, CURVE has made significant strides in its mission to enhance research and support interdisciplinary engagement and collaborative work. CURVE continues to receive national attention from notable research universities and is quickly gaining a reputation as a leader in digital scholarship innovation and support.

Above: Cutting the ribbon at the CURVE opening ceremony. Pictured left to right: James Weyhenmeyer, Vice President for Research and Economic Development; Tammy Sugarman, Interim Dean, University Library; Bryan Sinclair, Associate Dean and CURVE project leader, University Library; Mark Becker, President, Georgia State University.

Page 2 (Top left to bottom right):

A crowd gathers for opening remarks at the ribbon cutting ceremony.

Paul Fischer, M.M., Jazz Studies student, entertains the crowd.

LaShondra Arnold, M.S., Biology and Bio-Bus Fellow, prepares her demonstration of the BioDigital Human web site.

CURVE Interim Director Joe Hurley with Chief Technology Officer Dennis Rose.

Robert Bryant, M.A., Anthropology student and Student Innovation Fellow, demonstrates to President Becker and Laura Voisinnet how his team uses 3D visualizations in archaeology.

Honors student and Student Innovation Fellow Charbel Aoun demonstrates the touch-enabled interactWall.

Scientific Computing Specialist Neranjan Suranga Edirisinghe takes part in demos during the ribbon cutting.

Interim Dean Sugarman welcomes guests with opening remarks.

Amber Boll, M.S., Geosciences student and Student Innovation Fellow, discusses findings from an urban gardening, food deserts, and mapping project.

Timothy Crimmons, Director, Center for Neighborhood and Metropolitan Studies, presents an interactive documentary project on the neighborhoods surrounding Turner Field.

Ph.D. student Ercan Cacan explains the use of fluorescence microscopy to explore molecular biology in Associate Professor of Biology Susanna Greer's lab.

Associate Dean Sinclair explores the interactWall control panel.



## available technology

### **interactWall** (pictured)

A 24-foot-wide, touch-enabled video wall for complex models and visualizations. The wall allows for multiple, simultaneous touch users and requires no special training or knowledge to get started.

### **Collaborative Workstations**

High-end Dell Precision and Mac Pro workstations equipped with large displays and unique furnishings that accommodate small research teams.

### **4K Resolution Workstation**

A touch enabled, ultra-high resolution display connected to a PC offering 12 cores, 128 GB RAM, scientific-grade graphics processors, and an ever-growing list of specialized software.

### **3D Scanning Workstations**

Scanning hardware and software that can be used to create virtual models of objects, which can then be accessed from anywhere via the web.

## year one usage

Based on total campus ID card swipes from July 1, 2014 through June 30, 2015.

Undergraduate Students: **10,288**

Graduate Students: **3,460**

Faculty: **6,628**

Staff: **2,589**

CURVE officially opened September 10, 2014.



## research support

**THE PRIMARY FUNCTION** of CURVE is to support the research, digital scholarship, and original creative activities of Georgia State University students, faculty, and staff through specialized hardware, software, and services. Since its opening, CURVE has supported research across many disciplines and has also fostered interdisciplinary exchange. One notable example has been in the area of 3D visualization and modeling. Through the work of several Student Innovation Fellows, 3D modeling of objects and landscapes successfully crossed over into the research of several disciplines that do not normally use 3D modeling software. This cross-pollination has taken place between researchers in Anthropology, Geology, English, and Art History. All four departments have now integrated 3D modeling into research and teaching as a result of the 3D visualization projects and workshops initiated in CURVE.

CURVE is also supporting several data-intensive research projects. One notable example includes the creation of a hotel management software application developed by a team of undergraduate computer science students. Students noted that CURVE's high-end computers were the only computers available to them that were powerful enough to run their algorithms in the development stage. Without CURVE technology, their senior project could not have achieved its full potential.

During the spring and fall semesters, CURVE also supported several grant-funded projects. Prior to the grand opening in September, researchers involved with "Addressing Social and Environmental Disparities through Community Geography and Geographic Information Systems" through a National Science Foundation (NSF) Research Experience

for Undergraduates (REU) grant, were permitted to "pilot" the facility for their community geography and GIS-based research. CURVE's collaborative workstations and visualization system were also used by researchers at Georgia State and the Centers for Disease Control and Prevention (CDC) on a collaborative grant, "Individual and Community Health in Low Income Neighborhoods: An Evaluation of Atlanta's Beltline Project." Researchers involved with the NSF-funded "Hominin Sites Paleolakes Drilling Project" analyzed high resolution scans of sediment drill cores on the interactWall and the 4K workstation. Dr. Dan Deocampo, PI and Geosciences chair, demonstrated CURVE's unique visualization capabilities to his colleagues at the Smithsonian Institution, noting that analyzing the core images in CURVE has significantly improved the research process. Members of the Smithsonian Institution were so impressed that they have selected CURVE as the site of their 2016 project meeting.

CURVE is also supporting research in the new and growing area of graphics processing unit (GPU) enhanced computing. The University Library has partnered with Georgia State's new Research Solutions Unit to support new research computing methods and high-performance computing. Working closely with Research Solutions, CURVE is now equipped with several scientific-grade GPUs that chemistry researchers are using to build and test molecular models. Through CURVE, the Library and Research Solutions are also collaborating on ways to better support research and data visualization needs on campus.

## selected research projects and demonstrations

### **3D Atlanta**

Brennan Collins, Associate Director, Center for Instructional Effectiveness  
Robert Bryant, M.A. student, Anthropology, and Student Innovation Fellow

### **3D Molecular Models Using VMD**

Neranjana Suranga Edirisinghe, Scientific Computing Specialist, Research Solutions

### **3D Phoenix Project: Identifying and Scanning Artifacts Unearthed During MARTA Construction**

Robin Wharton, Lecturer, English  
Jeffery Glover, Associate Professor, Anthropology  
Robert Bryant, M.A. student, Anthropology, and Student Innovation Fellow

### **3D Visualizations in Archaeology: Exploring Mayan Ruins**

Jeffery Glover, Associate Professor, Anthropology  
Andrew Vaughan, M.A. student, Anthropology, and Student Innovation Fellow  
Robert Bryant, M.A. student, Anthropology, and Student Innovation Fellow

### **BioDigital Human**

LaShondra Arnold, M.S., Biology, and Bio-Bus Fellow

### **DNA Damage on the Molecular Level: How Ribonucleotide Intrusions Impact Duplex Structure**

Alexander Spring, Postdoctoral Fellow, Biology and Chemistry  
Marina Evich, Ph.D student in Professor of Chemistry  
Markus W. Germann's Lab

### **Fluorescence Microscopy to Explore Molecular Biology**

Ercan Cacan, Nagini Maganti, and Tomika Moody, Ph.D students from Associate Professor of Biology  
Susanna Greer's Lab, and Alexander Spring, Postdoctoral Fellow, Biology and Chemistry

### **H2O Tech Water Innovation Cluster**

Founding research meeting with representatives from the U.S. Environmental Protection Agency.

### **Hominin Sites Paleolakes Drilling Project (NSF funded project)**

Dan Deocampo, Chair and Associate Professor, Geosciences  
Lawrence Kiage, Associate Professor, Geosciences  
Nathan Michael Rabideaux, Ph.D student, Chemistry

### **Hotel Management Software Application Development**

Chris Fasciano, B.S. Student, Computer Science  
Daniel Delliara, B.S. Student, Computer Science  
Tracy Robbins, B.S. Student, Computer Science

### **Individual and Community Health in Low Income Neighborhoods: An Evaluation of Atlanta's Beltline Project (GSU and CDC Collaborative Seed Grant)**

Mathew Gayman, Assistant Professor, Sociology  
Holley Wilkin, Associate Professor, Communication  
Candace Rutt, Centers for Disease Control and Prevention (CDC)  
John Steward, Academic Professional, Public Health  
Chivon Mingo, Assistant Professor, Gerontology  
Scott Weaver, Assistant Professor, Public Health  
Isabel Garcia de Quevedo Landa, Centers for Disease Control and Prevention (CDC)

### **NVivo Software for Analyzing Qualitative and Unstructured Data**

Mandy Swygart-Hobaugh, Data Services and Social Sciences Librarian

### **REU Site: Addressing Social and Environmental Disparities through Community Geography and Geographic Information Systems (NSF-REU)**

Timothy Hawthorne, Assistant Professor, Geosciences  
Katherine Hankins, Associate Professor, Geosciences

### **Robinson Country Intelligence Index Research and Teaching Project**

Christopher Brown, Vice President for Research and Analysis, World Affairs Council of Atlanta

### **Tracing a History of Atlanta's Public Transit**

Shakib Ahmed, B.S. student, Computer Science  
Wasfi Momen, B.S. student, Computer Science  
Alexandra Orrego, B.S. student, Geosciences, with a minor in Computer Science  
Nicole Ryerson, M.A. student, Geosciences  
Amber J Boll, M.S. student, Geosciences  
Joseph Hurley, Interim Director, CURVE

### **Turner Field Neighborhoods Interactive Documentary Project "Stadiumville" (NEH proposal)**

Brennan Collins, Associate Director, Center for Instructional Effectiveness  
Timothy J. Crimmins, Director, Center for Neighborhood and Metropolitan Studies

### **Urban Gardening, Food Deserts and Mapping**

Nicole Ryerson, M.A. student, Geosciences, and Student Innovation Fellow  
Amber Boll, M.S. student, Geosciences, and Student Innovation Fellow

### **Using Tableau as a Data Visualization Tool to Explore Reoccurring Cancer Trends (2nd Place, Oral Presentation, 2015 Georgia State Undergraduate Research Conference)**

Charbel Aoun, First-year Honors student and Student Innovation Fellow

### **Visualizing Spatial and Temporal Data**

Ayush Shrestha, Computer Science Ph.D. candidate

### **Zoukis Summer Research Institute: Crime, Punishment and Policing in the South**

3-day institute sponsored by the Department of Political Science.

## **awards and honors**

### **Georgia State University Library**

2015 *Campus Technology Magazine* Innovators Award, Education Futurists category.

### **Collins Cooper Carusi Architects**

Selection of CURVE, 2015 AIA Atlanta Architects Tour.

### **New South Construction**

First Place for CURVE, 2015 Associated General Contractors Build Georgia Awards.

## **national recognition**

**CURVE** continues to receive national attention from other notable research universities. As a result, we are quickly gaining a reputation as a leader in data visualization and digital scholarship innovation and support. We have welcomed numerous site visits and are involved in ongoing conversations and collaborations with the following:

### **Association of Southeastern Research Libraries (ASERL)**

#### **College of William & Mary**

Arts and Sciences, Libraries

#### **Georgia Institute of Technology**

Library, Office of Information Technology, College of Architecture

#### **Stanford University Libraries**

David Rumsey Map Center

#### **University of Chicago**

Research Computing Office, Research and National Laboratories

#### **University of Cincinnati Libraries**

#### **University of Colorado – Boulder Libraries**

#### **University of Illinois**

Grainger Engineering Library Information Center

#### **University of Michigan Libraries**

#### **University of New Mexico Libraries**

#### **University of North Carolina at Chapel Hill Libraries**

#### **University of North Carolina at Charlotte Library**

#### **University of Pennsylvania**

School of Medicine, Institute for Biomedical Informatics

#### **University of South Carolina Libraries**



## workshops

### Selected workshops offered through CURVE

3D Modeling with Agisoft  
Bloomberg Terminal  
Cleaning Data with OpenRefine  
Demographic Maps and Data Made Easy: SimplyMap  
Demographic Maps and Data Made Easy: Social Explorer  
Spatial Symposium: An Introduction

### Selected workshops hosted in CURVE

Digital Humanities Series  
Entrepreneurial Startup Exchange  
Georgia Geographic Alliance Digital Mapping Workshop  
(National Geographic Foundation/Geosciences funded)  
Helping Your Students Visualize Data  
MATLAB  
R User Group (weekly gathering)  
Tableau Day

## selected class projects and presentations

CURVE technology, including the interactWall and collaborative workstations, have been widely used by instructors across a broad array of disciplines. These resources allow instructors to explore innovative ways of teaching and offer new learning experiences for Georgia State students.

### Architecture Seminar

Professor of the Practice Stuart Romm, Georgia Tech School of Architecture  
Students made CURVE their laboratory, an example of the library of the future.

### Honors Visualization Seminar

Associate Professor Stewart Ziff, Art and Design  
Students collaborated on final presentations using CURVE's unique technology.

### Illustration: Concepts through Images

Lecturer Jason Snape, Art and Design  
Students offered critical feedback of each other's artwork using the interactWall.

### Psychology of Instruction

Professor Nannette Commander, College of Education & Human Development  
Students collaborated on research projects and small-group interactive presentations.

### Urban Health

Academic professional John Steward, School of Public Health  
Graduate students engaged with members of the downtown community with maps and visualizations.

### Women in Science Honors Seminar

Assistant Professor Nadine Kabengi, Geosciences  
Students designed multimedia presentations for the interactWall.

### Writing on Material Culture

Lecturer Robin Wharton, English  
Students created 3D models using Agisoft 3D modeling software available in CURVE.

## open houses for departments and colleges

Numerous colleges and departments scheduled tours and orientation sessions in CURVE, including:

Andrew Young School of Policy Studies  
Center for Latin American & Latino/a Studies Faculty Affiliates  
College of Education & Human Development  
Department of Computer Science  
Department of Geosciences  
Department of History  
Department of Psychology  
Department of Sociology  
Institute for Women's, Gender, and Sexuality Studies  
J. Mack Robinson College of Business  
Byrdine F. Lewis School of Nursing and Health Professions  
School of Public Health



Clockwise from top:

Anthropology faculty member Jeffrey Glover gives students a virtual 360° tour of Mayan archaeological sites.

Student Innovation Fellow and M.S., Geosciences student Amber Boll offers an impromptu session using Google Earth.

Instructors engage students in new ways in CURVE's multiple collaborative spaces.

Students work in groups at CURVE collaborative workstations to analyze visual data.



## selected guest speakers

### **Georgia's Congressional Staffers from Washington, D.C.**

August 29, 2014

Visited CURVE to learn about research projects and innovations happening at Georgia State. Visitors included staff from the offices of Senators Saxby Chambliss and Johnny Isakson and Congressmen Sanford Bishop, Phil Gingrey, Tom Graves, Jack Kingston, John Lewis, Tom Price, Austin Scott, and David Scott. Faculty presentations included:

Susanna Greer, Associate Professor of Biology, on "Turning Immune Cells on to Cancer"

Rich Muller, Senior BioSafety Officer, on lab security on campus

John McMillian, Assistant Professor of History and author of the recent book, *Beatles vs. Stones*

### **Seven Technological Changes that are Reshaping Teaching and Learning (Sponsored by the Center for Instructional Innovation)**

October 21, 2014

Richard Halverson, Associate Professor of Educational Leadership and Policy Analysis in the University of Wisconsin-Madison School of Education

### **Technologies for Education vs. Technologies for Learners: How Technologies Have, Haven't and Might Change Schooling (Sponsored by the Center for Instructional Innovation)**

October 22, 2014

Richard Halverson, Associate Professor of Educational Leadership and Policy Analysis in the University of Wisconsin-Madison School of Education

### **World Community Grid**

November 12, 2014

Art Vandenberg, retired GSU Information Systems & Technology Data Administrator and Director of Advanced Campus Services

## scholarship about CURVE

### **Article**

Bryan Sinclair, "The University Library as Incubator for Digital Scholarship," *EDUCAUSE Review*, June 30, 2014.

### **Conference Presentations**

Krista Graham, Khyle Hannan, Joseph Hurley, and Bryan Sinclair, "Interactive Visualization: Video Walls for Collaborative Research and Discovery (Snapshot of CURVE), DLF Forum (Digital Library Federation), Georgia Tech, October 29, 2014.

Bryan Sinclair, Jill Sexton (UNC-Chapel Hill), and Joseph Hurley, "Visualization on the Big Screen: Hands-on Immersive Environments Designed for Student and Faculty Collaboration," CNI Spring Meeting (Coalition for Networked Information), Seattle, WA, April 13, 2015.

(Invited) Krista Graham, Panel Discussion, Re-think it: Libraries for a New Age, Grand Valley State University, Michigan, August 10-12, 2015.

(Invited) Bryan Sinclair, CURVE and technology-rich learning and research spaces, 4th Annual Designing Libraries for the 21st Century conference, James B. Hunt Jr. Library, Raleigh, NC, September 20-22, 2015.

## promotion and media

### **Feature**

"Ahead of the CURVE: Exploring High-End Visualization for Research and Education," *Campus Technology*, July 2015. Spotlight on 2015 Campus Technology Innovators Award for CURVE, Education Futurists category.

### **Georgia Library Association Website**

CURVE: Collaborative University Research & Visualization Environment in the Spotlight!, Spring 2015.

### **Georgia Public Broadcasting**

GPB filmed Geosciences researcher Brian Meyer's work on Georgia coastline erosion in CURVE. Aired Spring 2015.

## Campus Publications

“From the President” column, *Georgia State University Magazine*, Winter 2014.

“In the City: Ahead of the CURVE, New visualization technology enhances interactive learning experiences,” *Georgia State University Magazine*, Fall 2014.

“Library South welcomes the CURVE,” *the Signal*, March 1, 2014.

## GSU Home Page Feature

Archeologist Reveals Secrets Of Maya Site, Fall 2014, discussing CURVE and some of its unique technology for visualization.

## Video

Innovation in Action: CURVE. Produced by Georgia State University Student Innovation Fellows, Spring 2015.



## acknowledgments

Thanks to all our campus partners who provided support and expertise that led to the creation of this unique facility at Georgia State University Library. Because of you, and the many dedicated students, faculty, and staff included in these pages, CURVE had an overwhelmingly successful first year.



Top: Student Innovation Fellow and M.A., Anthropology student Robert Bryant instructs students on photographing artifacts in order to generate 3D models in Robin Wharton's writing on material culture class (English 3090).

Right: Student Innovation Fellows and faculty from multiple departments showcase visual projects at a special end-of-academic-year event, April 27, 2015.

# CURVE

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