

TACC develops visualization software for humanities researchers

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MostPixelsEver: Cluster Edition is an open source software tool that allows researchers, especially those in the humanities, to create interactive, multimedia visualizations on high resolution, tiled displays. The goal is to make visualization tools easier for humanities researchers to use. Credit: Texas Advanced Computing Center (TACC), The University of Texas at Austin

The Texas Advanced Computing Center (TACC) at The University of Texas at Austin has released MostPixelsEver: Cluster Edition, an open source software tool that allows researchers, especially those in the humanities, to create interactive, multimedia visualizations on high resolution, tiled displays like TACC's Stallion, one of the highest resolution tiled displays in the world at 328 million pixels.

"The goal is to make visualization tools easier for [humanities](#) researchers to use," said Rob Turknett, digital media, [arts and humanities](#) coordinator at TACC. "The proliferation of digitized textual, visual and aural resources is a great boon for the humanities, offering opportunities for new kinds of scholarship, but it also brings a new complexity."

Supported by a startup grant from the National Endowment for the Humanities titled "A Thousand Words: Advanced Visualization for the Humanities," the software is based on a language called Processing, a programming toolkit that makes it easier for people to create visualizations.

"As the amount of cultural data that scholars work with increases, it becomes crucial to visualize that data on a sufficiently high resolution display," Turknett continued.

"Conventional display resolutions simply aren't keeping pace with this explosion of online cultural data to be explored."

The work borrows ideas from a library called Most Pixels Ever by Daniel Shiffman at the Interactive Telecommunications Program at NYU's Tisch School of the Arts. However, Shiffman's version was not well-suited for tiled cluster displays, according to Brandt Westing, technical lead on the project and manager of the TACC/ACES Visualization Lab (Vislab).

"We re-wrote the software from scratch to work on any type of composite display from laptops to the highest-end visualization clusters and tiled displays."

Visualization clusters and tiled displays allow small groups of people to collaboratively explore large amounts of data and many types of visualizations, including: high resolution imagery (satellite, aerial photography, scientific instruments); high resolution movies (hi-res animations, time-series simulation results); 2D information display (maps, charts, graphs, data, text); and 3D visualization (complex geometries, interactive exploration of 3D datasets).

"Most of the tools that exist for these displays are developed by and for

scientists, yet there are many researchers from the humanities and arts who want to do visualization," Turknett said.

"The software that we've developed is part of an effort to make advanced visualization systems more accessible to people who may not have a deep technical background."

Jason Baldrige, an associate professor in the Linguistics Department at The University of Texas at Austin, researches a wide range of problems involving the connection among language, computation, geography and time. His research has the potential to improve a variety of applications based on natural language processing and text analytics that are widely used to analyze unstructured data.

"We're awash in very large collections of text and we simply cannot read through all of them," Baldrige said. "We need improved tools for exploring text collections so people can find interesting patterns, and this new software developed by TACC can help us accomplish this goal."

Baldrige's current project involves analyzing a collection of several hundred texts from the Civil War.

"Using the new software on TACC's Stallion, we're parallelizing the computations to do visualizations and view an enormous amount of data at once, both of which are incredibly useful in exploring the output from our models and applications." For example, Baldrige uses the software to identify text passages from memoirs that are connected to a particular city and time.

"And, because they connect language to the real world, they lend themselves to novel visualizations that illustrate the geographical and historical context of text collections and language use," Baldrige said.

Tanya Clement, an assistant professor at the School of Information, builds tools for scholars who analyze literary texts. "Humanities researchers have not had access to large data sets until recent decades. It's essential for humanities scholars to be involved in the creation of new [software](#) and tools so the concerns of the community are reflected," Clement said.

More information: Cluster edition is open source and available for download: [www.tacc.utexas.edu/tacc-softw ... ever-cluster-edition](http://www.tacc.utexas.edu/tacc-softw...ever-cluster-edition)

Provided by University of Texas at Austin

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