



Press Release

For Immediate Release

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Azavea Awarded National Science Foundation SBIR Grant to Explore Use of Graphics Processing Units (GPUs) for Faster Geographic Data Processing

Project Aims to Make Complex Analyses of Large, Image-based Datasets Possible with-Real-Time Results in Web-Based Software

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Philadelphia, PA, June 10, 2010 - [Azavea](#) (formerly Avencia), an award-winning geospatial analysis (GIS) software development company was awarded a Phase I Small Business Innovation Research (SBIR) grant of \$150,000 by the [National Science Foundation](#) to test the feasibility of using graphics processing units ([GPUs](#)) to substantially increase the performance of raster-based geographic information systems (GIS) software operations.

Most contemporary work in GIS involves one or more of three major types of activity: a) database development; b) spatial analysis and map production; and c) web-based map display. Applications of GIS analysis technology are enormously diverse: land planning, climate change modeling, assessing the impact of sea level rise, natural hazard risk assessment, military scenario planning, cell phone tower placement, and business siting, and many more. Currently, these applications, which involve large amounts of geographic data-processing are usually tied to desktop workstations because of the significant amount of time, memory, and processing power required to execute the operations. Azavea's GPU project seeks to achieve substantial improvement-in the performance of operations on raster-based image data. The research team is optimistic about prospects for achieving processing speeds that are 10 to 20 times faster than current commercial technology and thereby enabling a whole new class of software for web and mobile devices.

In the past, GPUs have been used almost exclusively for video games and movies. In recent years, however, scientists and researchers have begun to apply the geometric calculation capabilities of GPUs in fields ranging from fluid dynamics to medical imaging and oil exploration. In this project, Azavea is using the [OpenCL language](#), originally developed by Apple and now managed by Khronos Group, the nonprofit technology consortium. With OpenCL™, Azavea hopes to create a geographic data-processing framework that can use GPUs from multiple manufacturers.

In this Phase I SBIR project, Azavea is focusing on new algorithms for several types of “Map Algebra” calculations. [Map Algebra](#) is a widely-used conceptual framework for raster-based geospatial analysis in all of the contemporary desktop GIS tools. It was originally developed by Dr. C. Dana Tomlin, who is also serving as a consultant on the GPU project. In 2006, Azavea began development of [DecisionTree@](#), a distributed geographic data processing system to accelerate one particular Map Algebraic operation. That work proved to be quite successful and has since been applied to problems in economic development, elections, public health, and sustainability. The GPU project is a natural outgrowth of that effort and one that builds on Azavea’s expertise in creating distributed software systems.

“This is one of the most promising efforts in which I’ve ever been involved in terms of both the fundamental algorithms being developed and their implications for real-world applications that will have a direct and profound impact on our use of geospatial data.” – Dr. C. Dana Tomlin, Professor and Co-director of the Cartographic Modeling Laboratory at the University of Pennsylvania

Azavea’s GPU-Based Raster Processing Algorithms project is supported by the [Small Business Innovation Research \(SBIR\) program of the National Science Foundation](#), Directorate for Engineering, Division of Industrial Innovations and Partnerships, Award Number (IIP-0945742).

This is the sixth time that Azavea has been awarded an SBIR grant. Previous awards were from the [U.S. Department of Education](#) (Phase I), the [U.S. Department of Agriculture](#) (Phase I for two projects), and the [National Science Foundation](#) (Phase I and Phase II to develop [HunchLab](#), Azavea’s geographic crime visualization, early warning and risk forecasting software).

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About Azavea (formerly Avencia)

[Azavea](#) is an award-winning geospatial analysis (GIS) software development firm specializing in the creation of location-based web and mobile solutions, as well as geospatial analysis services to enhance decision-making. Azavea is committed to working on projects with a strong social value component in order to promote the emergence of more [dynamic, vibrant, and sustainable communities](#). Each of Azavea’s projects, products and pro bono engagements showcases this commitment. Azavea is a certified [B Corporation](#). For more information, visit <http://www.azavea.com/>

If you would like more information about Azavea or to schedule an interview with Robert Cheetham, Azavea CEO and President, please contact Abby Fretz at (215) 701 – 7503 or e-mail afretz@azavea.com

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