

Waitt Family Foundation Project Develops Whole Brain Catalog™

Free Online Resource Aims to Revolutionize Neuroscience Collaborations via a 3D High-resolution Virtual Catalog of the Brain

October 19, 2009

Doug Ramsey

At the year's biggest international meeting of neuroscientists, researchers from the University of California, San Diego will unveil a tool that could revolutionize the way scientists and students explore and map the mysteries of the brain. Beginning October 18, the team will demonstrate beta version 0.7 of the Whole Brain Catalog™ at *Neuroscience 2009*, the 39th annual meeting of the Society for Neuroscience, held this year in Chicago.

The Whole Brain Catalog™ is a ground-breaking, open-source, 3D virtual environment that connects members of the international neuroscience community. Researchers at UC San Diego's Center for Research in Biological Systems (CRBS) have been developing the Catalog since 2008 with support from the Waitt Family Foundation. The goal of the Whole Brain Project™: to pioneer brain research at the intersection of neuroscience, information technology, data management and scientific visualization. As the Project's flagship, the Whole Brain Catalog™ aims to accelerate resolving the mysteries of the brain while also facilitating solutions to today's intractable challenges in brain research through cooperation and "crowd-sourcing."

"Decades of neuroscience research have generated massive volumes of data far larger and more complicated than any developed in particle physics or astrophysics," said CRBS Director Mark Ellisman, lead scientist on the Project and a professor of neuroscience at UC San Diego. "When Ted Waitt first heard of our vision to develop a next-generation 3D virtual brain that integrates the torrent of public neuroscience data from around the world, he became fully engaged. The Catalog aligns well with the Waitt Family Foundation's commitment to social progress, scientific exploration, and gateways to knowledge. Support of the Whole Brain Catalog™ fosters collaborations around the grand challenge of brain structure and function."

"With the broadest engagement of the scientific community, the value of Whole Brain Catalog™ increases exponentially," noted Ted Waitt, founder of the Waitt Family Foundation. "In time, this resource may constitute the largest single gateway to brain science research data available anywhere. From that neuroscientists will gain valuable new insights, and important new understandings will follow."

The Whole Brain Catalog™ offers a powerful information integration tool to allow scientists to peer deep inside a virtual brain composed of hundreds of datasets -- all from their personal computer. The Catalog provides rich, multi-scale views for researchers to zoom in, out and around structures deep in the mouse brain, and to trace neural pathways exploring their *cellular* and subcellular details. An open-source, 3D graphics engine used in graphics-intensive computer gaming generates high-resolution visualizations that bring data to life through biological simulations and animations for researchers to clearly see details such as electrical storms across neurons.

Researchers can access and navigate this "brain information system" via the Internet, much as students and consumers currently navigate today's ubiquitous geographic information systems (GIS), including Google Earth™ and MapQuest™. With a few clicks of the mouse, researchers can increase the explanatory power of

their own scientific datasets by intermixing them with datasets contributed by others from around the world. Much as a motorist or homeowner might use Google Maps™ to get directions or find a house, scientists can zoom in for a "street-level view" perspective of their datasets uploaded to the Whole Brain Catalog™, allowing them to understand the broader context of their research, and even explore alternative routes to new insights by reusing data imported from other researchers.

Project neuroscientists and software engineers joined forces to establish the Whole Brain Catalog™ as an easy-to-access gateway to the world's largest, dynamic collection of neuroscience resources, including the Cell Centered Database and the Neuroscience Information Framework (NIF), both well-established scientific programs of the National Institutes of Health Blueprint for Neuroscience.

UC San Diego researchers will demonstrate the features of the Whole Brain Catalog™ October 18-21 at the McCormick Place Convention Center, booth #2106.

Future phases of this new tool will be released in the coming year, and the Whole Brain Project™ team plans to engage the scientific community in creating a strategic roadmap for the Catalog's continued development.

The Catalog is undertaken in cooperation with the International Neuroinformatics Coordinating Facility (INCF), an international consortium established by the OECD Global Science Forum. The Catalog accesses the INCF's Blue Gene supercomputer to rapidly simulate available brain models. The system also uses supercomputing resources available at UC San Diego. More information about the Catalog, including a downloadable copy of the tool, is available at <http://wholebraincatalog.org>.

Note to Editors: A gallery of high-resolution images from the Catalog is available at <http://www.wholebraincatalog.org/gallery.shtm>. Video clips for free use of television and online video producers are available at <http://video-jsoc.ucsd.edu/calit2/WBC/>. The clips include two sound-bites from Principal Investigator Mark Ellisman, one from project scientist Steve Larson, and three video-only b-roll clips of the Whole Brain Catalog in action, and all are available in AVI, MPEG2 HD, and MP4 formats.

About the Whole Brain Project™ The Whole Brain Project™ integrates neuroscience data, cyberinfrastructure, and next-generation software tools for the worldwide research enterprise. With it, connections are made and collaborations are born to explore the burgeoning new discoveries about brain structure and function. In collaboration with international teams of neuroscientists, CRBS software engineers are creating an open community resource to which all data collectors may contribute, finally unifying the disparate and heterogeneous products of modern neuroscience in a shared environment.

For more information, see www.wholebrainproject.org.

About The Waitt Family Foundation The Waitt Family Foundation is a charitable organization based in La Jolla, California. Since 1993, the Foundation has made over 2,000 grants to programs that help us understand our past, improve the present, and prepare for the future. The Foundation funds partnerships and projects that seek a deeper understanding of our collective history, expand the potential of the human mind, and improve knowledge and understanding through historical and scientific research and exploration.

For more information, see www.waittfoundation.org

About the Center for Research in Biological Systems The Center for Research in Biological Systems (CRBS) is a UC San Diego organized research unit devoted to fundamental research concerning cell structure and function relationships, especially those found in nervous systems. Established in 1996, CRBS is comprised of an interdisciplinary infrastructure in which scientists from biology, medicine, chemistry, mathematics, engineering and physics can work with leading researchers in computer science and information technologies. CRBS's multidisciplinary, multi-investigator collaborative research offers new and varied perspectives to neuroscience, leading to the development of new technologies and drugs as well as training the next generation of researchers

in biological systems. The Whole Brain Project™, the Cell Centered Database, and the Neuroscience Information Framework are projects of CRBS. For more information, see <http://crbs.ucsd.edu>.

Media Contact: Doug Ramsey, 858-822-5825 or dramsey@ucsd.edu

