

PHILANTHROPIC OPPORTUNITIES AT AIM

The Artificial Intelligence in Medicine Program at the USC Mark and Mary Stevens Neuroimaging and Informatics Institute

To change the trajectory of diagnosis, treatment, and prevention options for neurological disease, we must answer urgent questions about the human brain across the lifespan. **AIM: The Artificial Intelligence in Medicine Program** is advancing the use of artificial intelligence and machine learning to examine how Alzheimer's disease progresses, how exposure to toxins in the environment can affect brain health and development, what causes epileptic seizures, and more.

Philanthropic support will bolster and accelerate our pioneering research as well as our training programs that are working to further incorporate new innovations into clinical practice. There are multiple areas where your gift can have an immediate and profound impact.

REVOLUTIONIZING MEDICAL IMAGING:

Your gift can advance the role of AI and machine learning in medical imaging protocols and help to rapidly transition new AI tools into the clinic. We curate the world's largest collection of training data for machine learning of neuroimaging data and are creating resources that can streamline disease diagnosis and progression modeling, surgical outcome prediction, and more.

FORECASTING CLINICAL OUTCOMES:

Philanthropy will help AIM to use our massive collection of imaging, genetic, and clinical data to build forecasting algorithms that predict disease and treatment outcomes. For example, we created one of the world's largest open-source datasets of MRI scans from stroke patients, then used machine learning to identify lesions and forecast which patients are likely to respond to various rehabilitation therapies for stroke.

FUNCTIONAL MRI TECHNOLOGY (FMRI):

You can support the development of AI and deep-learning algorithms for assessing the structure, function, and connectivity of the living human brain—creating tools that are directly applicable to challenges in basic research, translational research, and clinical assessment.

ALZHEIMER'S DISEASE NEUROIMAGING INITIATIVE (ADNI):

We host all data for ADNI, a global data sharing and collaboration effort that has fueled hundreds of studies. Your gift can support current large scale Alzheimer's disease studies at USC including an investigation on why twice as many women as men develop the disease; a large-scale analysis of Alzheimer's disease in Mexican Americans; and a five-year study of connectivity in the brainstem to assess its role in disease development and progression.

IMAGE ABOVE: DTI fiber bundle representation of the brain. Researchers at the USC Stevens Neuroimaging and Informatics Institute have been developing scalable tools for modeling fiber bundles using diffusion MRI and applying them to better understand how the structure of the human brain changes in health and disease.

THE PARKINSON'S PROGRESSION MARKETS INITIATIVE (PPMI):

We host all data for the worldwide, flagship study of the Michael J. Fox Foundation. You can support research at AIM that has contributed to several recent breakthroughs, including the development of machine learning models to aid in the early diagnosis of Parkinson's disease.

ENHANCING NEURO IMAGING GENETICS THROUGH META-ANALYSIS (ENGIMA):

We are home to the ENIGMA Consortium, which unites more than 1,000 scientists in over 40 countries and has produced indispensable new knowledge through creation of detailed maps of how neurological diseases and disorders affect the brain. Through this research, your support can help lead to a better understanding of the underlying biology of the brain.

DATA ARCHIVE FOR THE BRAIN INITIATIVE (DABI):

Your support can help to design and build the data archive for the NIH's prestigious BRAIN Initiative.

This shared repository ingests, harmonizes, aggregates, stores, visualizes, and disseminates invasive human neurophysiology data collected by investigators—allowing researchers to organize, store, disseminate, analyze, and visualize vast stores of data.

GLOBAL ALZHEIMER'S ASSOCIATION INTERACTIVE NETWORK (GAAIN):

We designed, built, and continue to manage the Alzheimer's Association's premier data-sharing platform.

Support for this unique federated model will help to connect researchers around the globe investigating causes, prevention, and treatment of Alzheimer's disease. GAAIN currently maintains data from more than 525,660 subjects from 58 Data Partners.

PREDICTING BRAIN AGE:

A gift to help predict brain age—which can differ from chronological age—can help us better understand the factors associated with neurodegeneration and Alzheimer's disease. Our team used a convolutional neural network (CNN) model, a new, more accurate mathematical model, to better predict brain age, which led to the discovery of new genetic markers. Another INI team published a new deep learning model for predicting brain age using MRI scans, providing novel insight on aging patterns within the brain.

ULTRASCALE MACHINE LEARNING TO EMPOWER DISCOVERY IN ALZHEIMER'S DISEASE BIOBANKS:

As part of AI4AD, a five-year, NIH-funded effort, we are creating algorithms that analyze data at a previously impossible scale. Your gift will help to enable discovery of new features in the genome that influence the biological processes involved in Alzheimer's disease.

Thank you for your interest in this transformational research that is uniting researchers and data from across the world.

Watch this video to learn more about AI at the Stevens INI:



TO MAKE A GIFT, OR FOR MORE INFORMATION, PLEASE CONTACT:

Gina Weitzel

Senior Associate Vice President

Health Sciences Advancement

Keck Medicine of USC

213-713-1251

gweitzel@usc.edu

Keck
Medicine
of USC