

## **ADSP Phenotype Harmonization Consortium: Neuroimaging Harmonization and Application**

Friday, July 26, 2024 | 1-5 p.m.

Marriott (Grand Ballroom I) — Philadelphia, USA

All times are in Eastern Standard Time

In-person attendance only

### **Overview**

The Alzheimer's Disease Phenotype Harmonization (ADSP-PHC) was established to provide large-scale data harmonization across all the cohort studies in the ADSP to facilitate joint analysis of cognitive, neuroimaging, biomarker, risk factor, and neuroimaging outcomes. Our first data release included longitudinal cognitive data from thousands of participants, and we held an immersive workshop at AAIC 2023 to introduce the dataset and provide hands-on training in both the harmonization approaches themselves and in statistical applications of these resources to answer important questions in the field. Our second data release includes longitudinal neuroimaging data for the first time.

This workshop will provide a detailed overview of the image processing and statistical harmonization approaches that our expert neuroimaging data harmonization teams applied to calculate regional brain volumes across cohorts while dealing with the many differences in data acquisition hardware and software across sites. To further enhance the reproducible implementation and accessibility of these tools, a comprehensive NeuroImaging Chart (NiChart) ecosystem was designed, enabling constructive integration, statistical harmonization, and machine learning-centric data analyses across studies. This workshop will include a live demonstration of NiChart software suites with a hands-on opportunity to access, analyze, and even apply these harmonization approaches in attendees' own datasets. NiCHART allows for integration of machine learning models derived by the research community. As the ADSP-PHC and AI4AD Machine Learning models are constructed, they will become accessible via niCHART, among other platforms.

While the workshop will have a particular focus on individuals who are already leveraging neuroimaging data in their own research, it will also be approachable for researchers who have not worked with neuroimaging data in the past.

## **Organizing Committee**

- Timothy Hohman, Vanderbilt Memory & Alzheimer's Center
- Michael Cuccaro, University of Miami
- Arthur Toga, Laboratory of Neuro Imaging (LONI)
- Christos Davatzikos, University of Pennsylvania
- Shannon Risacher, Indiana University School of Medicine
- Guray Erus, University of Pennsylvania
- Sindhuja Tirumalai Govindarajan, University of Pennsylvania
- Haochang Shou, University of Pennsylvania

## **Target Audience**

This ISTAART Immersive workshop is targeted to attendees who are involved in research and is pitched at a beginner-intermediate-advanced level.

## **Learning Objectives**

1. Explain ADSP-PHC neuroimaging harmonization methods and applications
2. Apply harmonization approaches to own data challenges
3. Examine novel research questions leveraging the harmonized resources from the ADSP-PHC

## **Registration**

Educational workshops are offered for in-person attendance only. Workshops require a separate registration fee in addition to AAIC full conference registration, or they may be purchased as stand-alone events.

## Agenda

Time	Session Details	Speakers and Moderator
Noon - 1:00 p.m.	<b>Lunch</b>	
1:00 p.m. - 2:00 p.m.	<b>Didactics:</b> Introduction to Harmonization <ul style="list-style-type: none"> <li>• Neuroimaging Chart (NiChart)</li> <li>• Neuroimaging Harmonization</li> <li>• Freesurfer Harmonization</li> </ul>	Speakers: Guray Erus, PhD Haochang Shou, PhD Shannon Risacher, PhD  Moderator: Timothy J. Hohman, PhD
2:00 p.m. - 2:15 p.m.	<b>Break</b>	
2:15 p.m. - 4:15 p.m.	<b>Breakout Sessions:</b> Two 60-Minute Rotations <ul style="list-style-type: none"> <li>• Hands-on Application of NiChart</li> <li>• Deep Dive into ComBatFamily Pipeline</li> <li>• Freesurfer Applications</li> <li>• ADSP Data Access</li> </ul>	Guray Erus, PhD Haochang Shou, PhD Shannon Risacher, PhD Timothy J. Hohman, PhD
4:15 p.m. - 4:25 p.m.	<b>Break</b>	
4:25 p.m. - 5:00 p.m.	<b>Panel Discussion</b>	Moderator: Timothy J. Hohman, PhD  Panelists: Guray Erus, PhD Haochang Shou, PhD Shannon Risacher, PhD Sindhuja Tirumalai Govindarajan, PhD