**Demo: NiChart - Neuro Imaging Chart of AI-based Imaging Biomarkers**

**Brief Topic Overview:** NiChart (NeuroImaging Computational Harmonization and ARtificial intelligence Toolbox) is a set of modular but integrated software tools for neuroimaging research, and a cloud-based web application to provide wide access to these tools. NiChart enables mapping of large-scale multi-modal brain MRI data into a dimensional system of neuroimaging derived measures, including signatures implemented by machine learning (ML) models. This demo will provide an overview of NiChart, detailing its components, demonstrating the sMRI pipeline on our web portal using an open-source dataset, and introducing other key packages for fMRI and dMRI processing and analysis. Attendees will learn how to use various components of NiChart, how to derive imaging derived phenotypes from their own data and how to visualize and compare their data to NiChart-based normative ranges or distributions from specific disease subgroups.

**Expected Learning Outcomes:** Attendees will gain insights into:

* The structure and components of the NiChart ecosystem.
* sMRI data analysis using NiChart cloud application.
* The scope of NiChart packages for processing different MRI modalities and their application in neuroimaging research.
* How to contribute to and benefit from the NiChart community.

**Relevance to ISBI Community:** NiChart aligns with ISBI's focus on biomedical imaging and innovation in neuroimaging analysis techniques. Its foundation on open science and ML applications in neuroimaging makes it a valuable tool for the ISBI audience, including those involved in neurodegeneration, brain aging, and neuropsychiatric disorders research. NiChart's relevance is underscored by its potential for cross-study analysis and harmonization, facilitating collaborations within the ISBI community.

**GitHub / Public Software URLs:**

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| * sMRI: [NiChart DLMUSE](https://github.com/CBICA/NiChart_DLMUSE) | * fMRI: [XCP-D Documentation](https://xcp-d.readthedocs.io/en/latest/) |
| * dMRI: [QSIPrep Documentation](https://qsiprep.readthedocs.io/) | * Functional Network: [pNet](https://github.com/YuncongMa/pNet) |
| * Harmonization: [ComBatFam Pipeline](https://github.com/Zheng206/ComBatFam_Pipeline) | * SPARE Score: [SPARE Score](https://github.com/CBICA/spare_score) |

**Target Audience:** This demo is designed for a broad range of participants, including students, researchers, and clinicians in neuroimaging and related fields. No specific prior knowledge is required, but familiarity with MRI data and basic concepts in machine learning and neuroimaging will be beneficial. The software involves Python and web technologies, catering to both technical and clinical audiences.

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