**NeuroImaging Brain Chart: Individualized Imaging Biomarkers of Disease and Aging**

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Teaching Points

The NiChart suite, combines Machine Learning (ML) and neuroimaging, facilitating image processing and the calculation of personalized biomarkers for brain diseases and aging using neuroimaging data. This presentation showcases how NiChart aids clinicians and researchers by providing easy-to-use, cloud-based, and locally installable tools for analysis. Key features include automated extraction of multi-modal image descriptors, harmonization, supervised and unsupervised ML models for disease classification, subtyping, and heterogeneity analysis.

Outline

The NiChart suite is fundamentally a collection of interoperable tools designed to function both independently and as part of an integrated framework. While each module can be operated locally, we have also developed a cloud application, allowing users to register and utilize the online portal for data processing, harmonization, and analysis through an easy-to-use user interface. This suite includes specialized tools for sMRI, fMRI, and dMRI analysis. The sMRI pipeline is showcased through its application on our web portal using an open-source dataset. NiChart's goal is to allow users to apply advanced ML models on their images to generate a panel of imaging-derived phenotypes and disease-specific markers. Additionally, the platform offers tools for users to visualize and compare phenotypes against normative data or specific disease subgroups. The framework encourages active contribution from researchers and clinicians to foster a collaborative community.

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