Brain MoNoCle Version Notes

This file summarises the changes made in each version of Brain MoNoCle (Brain Morphology Normative modelling platform for abnormality and Centile estimation; https://cnnplab.shinyapps.io/BrainMoNoCle/).

Table of Contents

Version 1.0

Date deployed

07/05/2024

Associated publication

Little et al. 2025 (https://doi.org/10.1162/imag_a_00438)

Feature notes

Brain MoNoCle allows users to apply our normative modelling pipeline to their own neuroimaging data.

The app can handle the following data types:
- Freesurfer-generated measurements of cortical thickness (CT), cortical volume (CV), and surface area (SA); and
- Independent components of cortical morphology (K, I and S) at hemisphere-level.

The app produces:
- z-scores and centiles for each participant in the user dataset;
- summary statistics for each group in the user's data;
- scatterplots showing the user data plotted against the normative data for each structural metric and for each brain region;
- 'brain plots', showing the estimated abnormality (z-score for individual participants or Cohen's d for groups) for each brain region (for Freesurfer generated metrics only); and
- a downloadable html report summarising the outputs.

The normative models are generating using generalised additive models for location, scale and shape (gamlss) and account for biological and technical covariates (age, sex, and scanning site).

The normative dataset consists of n=3,276 healthy individuals (aged 5-95 years old) across 21 sites.

Other notes

The website url was changed to https://cnnplab.shinyapps.io/BrainMoNoCle/ on 04/07/2024. The original url (https://cnnplab.shinyapps.io/normativemodelshiny/) was made redundant.

A JISC mailing list was created on 01/08/2024.

Version 1.1

Date deployed

07/11/2024

Associated publication

n/a

Feature notes

Added normative models for independent components of cortical morphology at lobe-level (frontal, parietal, temporal, and occipital lobes).

Added 'brain plots' for lobe-level independent components of cortical morphology.

Added a 'Test Run' button, allowing users to easily test the app functionality without having to upload data.

Updated documentation (instructions, FAQs, report) accordingly.

Bug fixes

- summary stats not showing if user data contains only healthy controls (HC): now shows HC data

Other notes

n/a

Version 1.2 (in progress)

Date deployed

TBC - 2025

Associated publication

TBC

Feature notes

Added normative models generated with new normative dataset. Normative dataset consists of n=TBC healthy participants (aged TBC) from TBC sites.

Added subcortical volume data as an option for the Freesurfer stream and added option to generate a 'brain plot' for subcortical areas.

Updated documentation (instructions, FAQs, report) accordingly.

Bug fixes

- models expected 'eTIV' in user data: the model will now run if these columns are not present
- case-sensitive metadata column headers: the app is now more flexible and can handle changes in upper and lower cases in the column headers
- numeric Subject IDs: the app will now run if the SubjectIDs are numeric rather than characters

Other notes

n/a