NOT-OD-21-094 AI-Readiness:
Closeout meeting

The Development of Individual Differences in Adolescent Brain Structure and Risk

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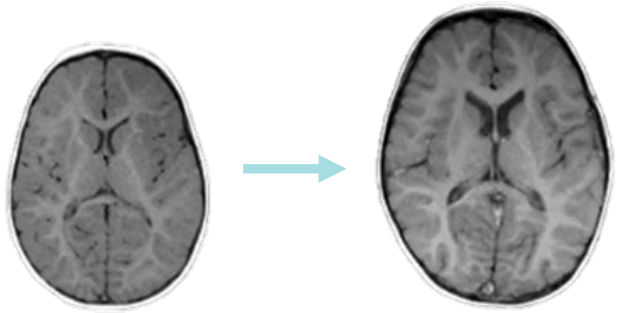
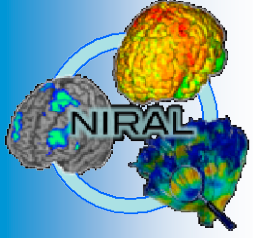
Summary/Project Goals

- Machine Learning works better on complete data
- EBDS: Longitudinal study of brain development with significant missing data
  - MRI & cognition/behavior at 1, 2, 4, 6 & 8 years of age
  - Includes set of subjects at risk for mood disorder
- Goals
  - Impute/rescue missing longitudinal data at image level
  - Make full dataset AI-ready for use by researchers (on NDA)
    - For predicting later cognitive performance
    - For classification of subjects at risk

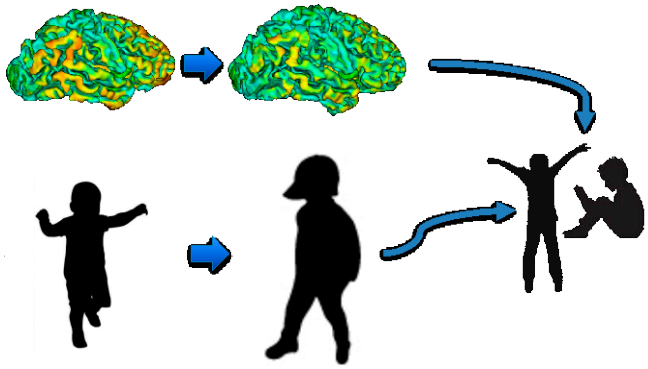




Results

- EBDS MRI data gathered and available in NDA
  - Resampled, skull stripped, pre-processed
  - 790 subjects - 1982 visits, timepoints
- Imputation models trained & applied
  - inter-modality at each age
  - inter-age for age pairs
  - 2758 visits/MRI imputed
- Code (soon with pretrained models): https://github.com/yoonmihong/DeepImputation

To Do's



- In next 6 months:
  - Combine imputation results
  - Automated processing of imputed data
  - Share imputed data with NDA
  - Generate example prediction scripts for NDA data
  - ML challenge proposal for MIDL 2023 in prep
- Challenges
  - Time frame, getting started
  - How to make subject data easily accessible, without needing to re-consent subjects
  - Unresolved training biases