Reproducible Exploration of Neuroimaging Data

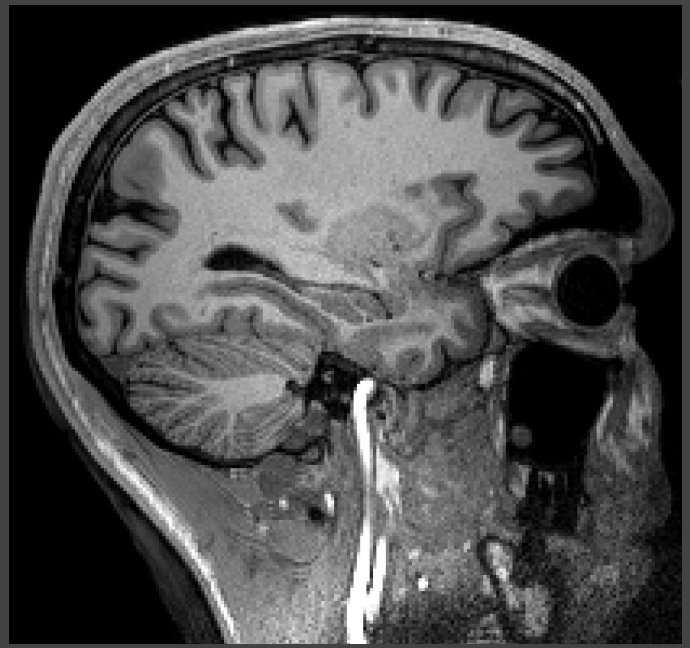
corticometrics/rend

Lee Tirrell and Paul Wighton
CorticoMetrics
JupyterCon 2020

AI in Neuroimaging

Improve patient care, reduce clinician workload

Brain MRI scan...



AI IN NEURO

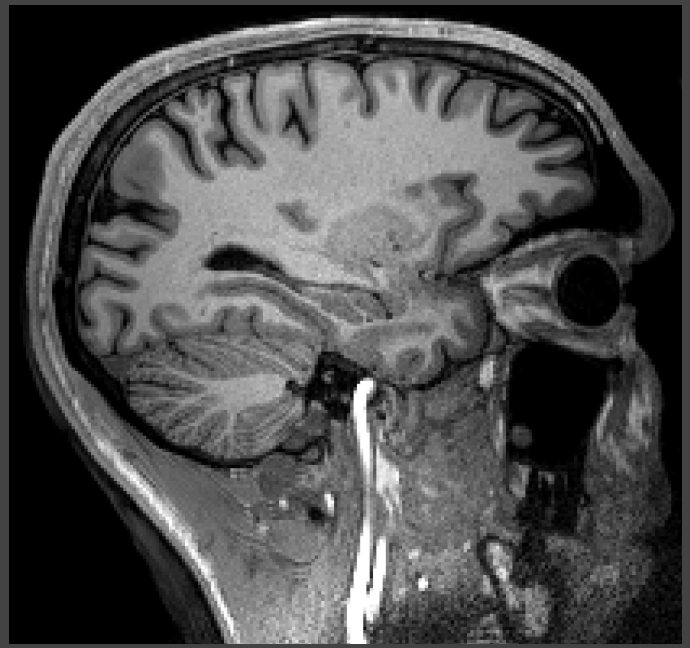
REPRO-DUCIBILITY

EXPLORE DATA

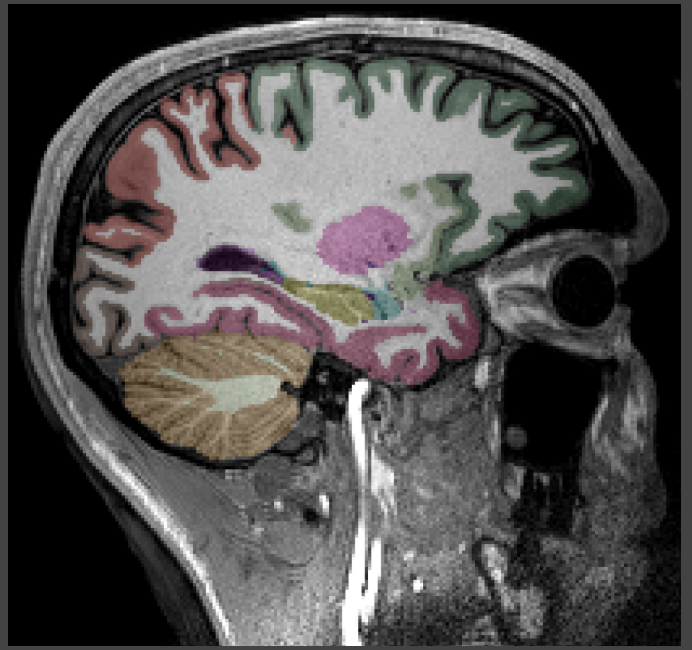
SUMMARY

DEMO

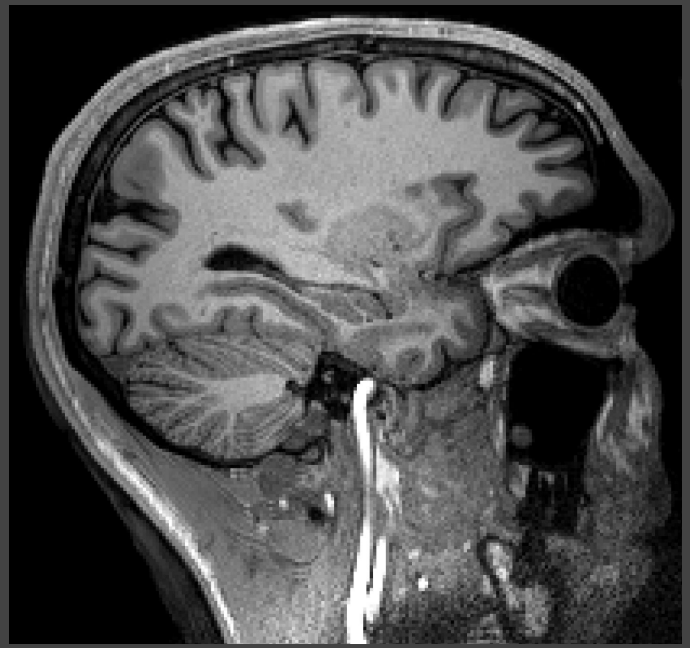
Brain MRI scan...



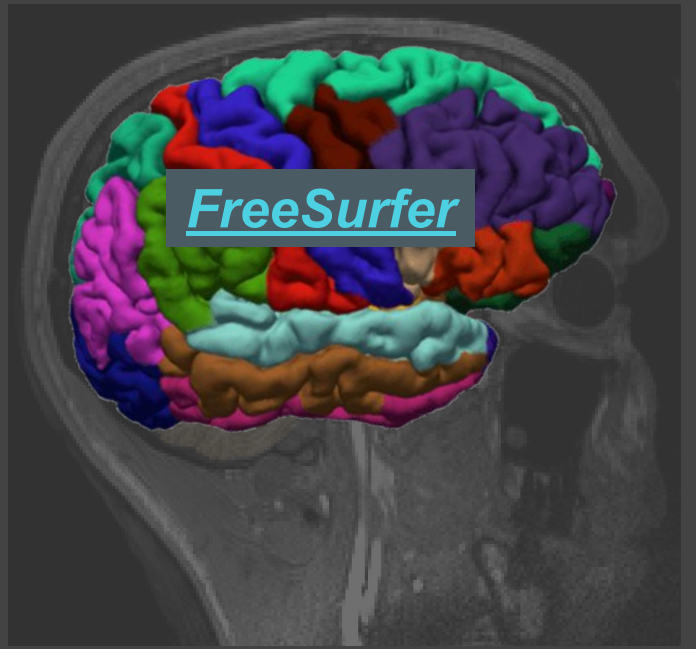
with anatomical labels



Brain MRI scan...



with anatomical labels



Reproducible, ***interactive*** data analysis and quality checking are ***essential*** for creating trusted and reliable tools

6

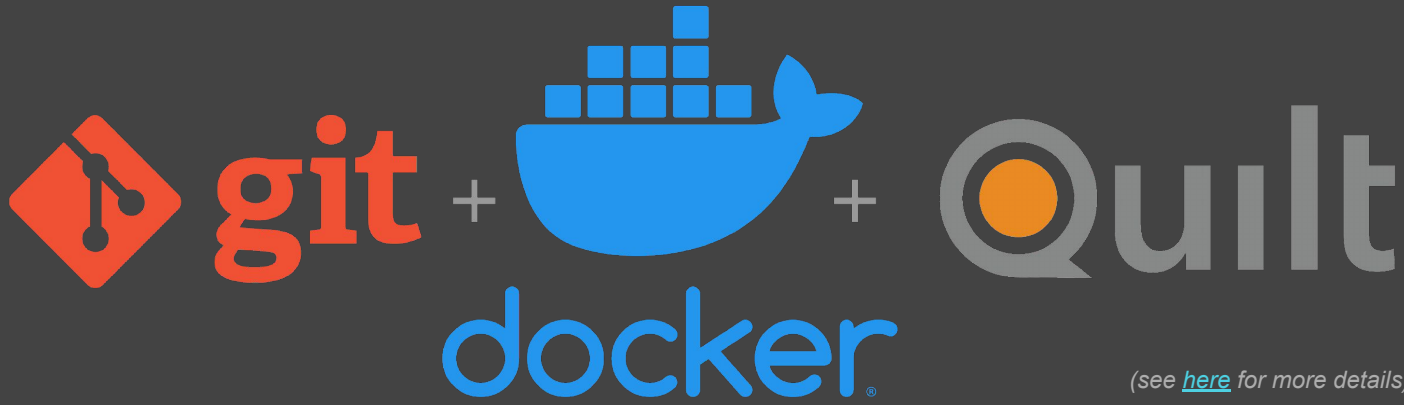
AI IN NEURO

REPRO-DUCIBILITY

EXPLORE DATA

SUMMARY

DEMO



(see here for more details)

With version controlled ***code***, computational ***environment*** and ***data***, analyses can be easily replicated, even during experimentation

AI IN NEURO

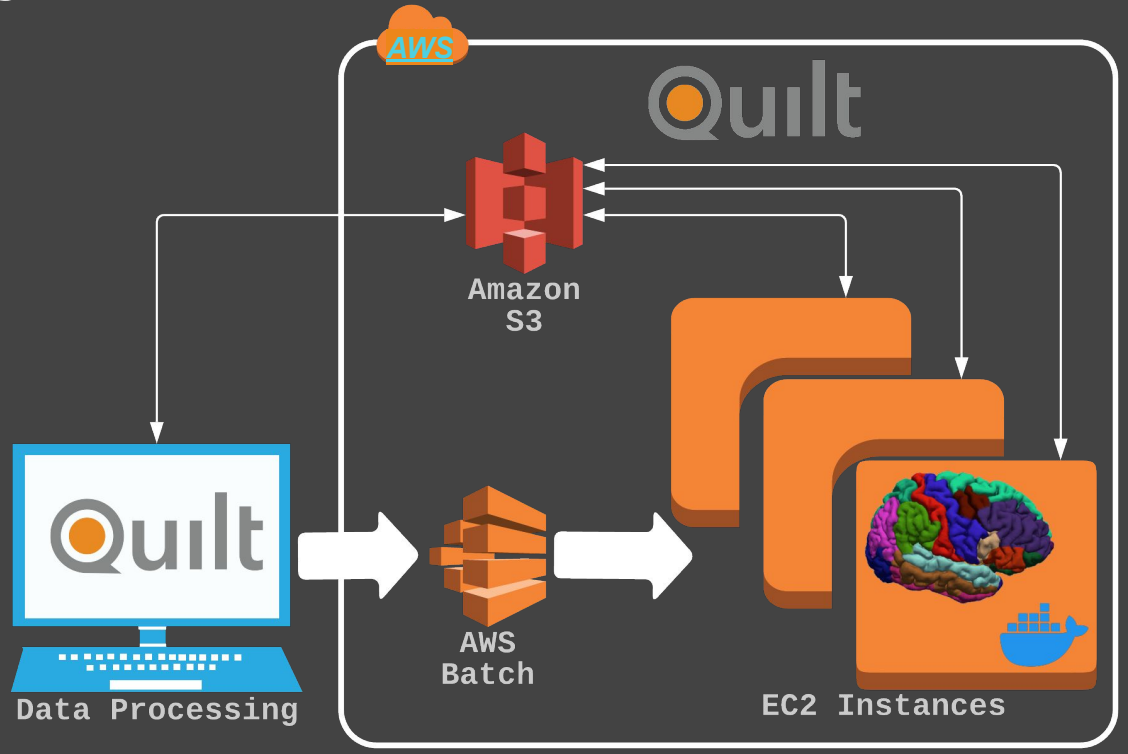
REPRO-DUCIBILITY

EXPLORE DATA

SUMMARY

DEMO

Exact analyses against fast moving targets



AI IN NEURO

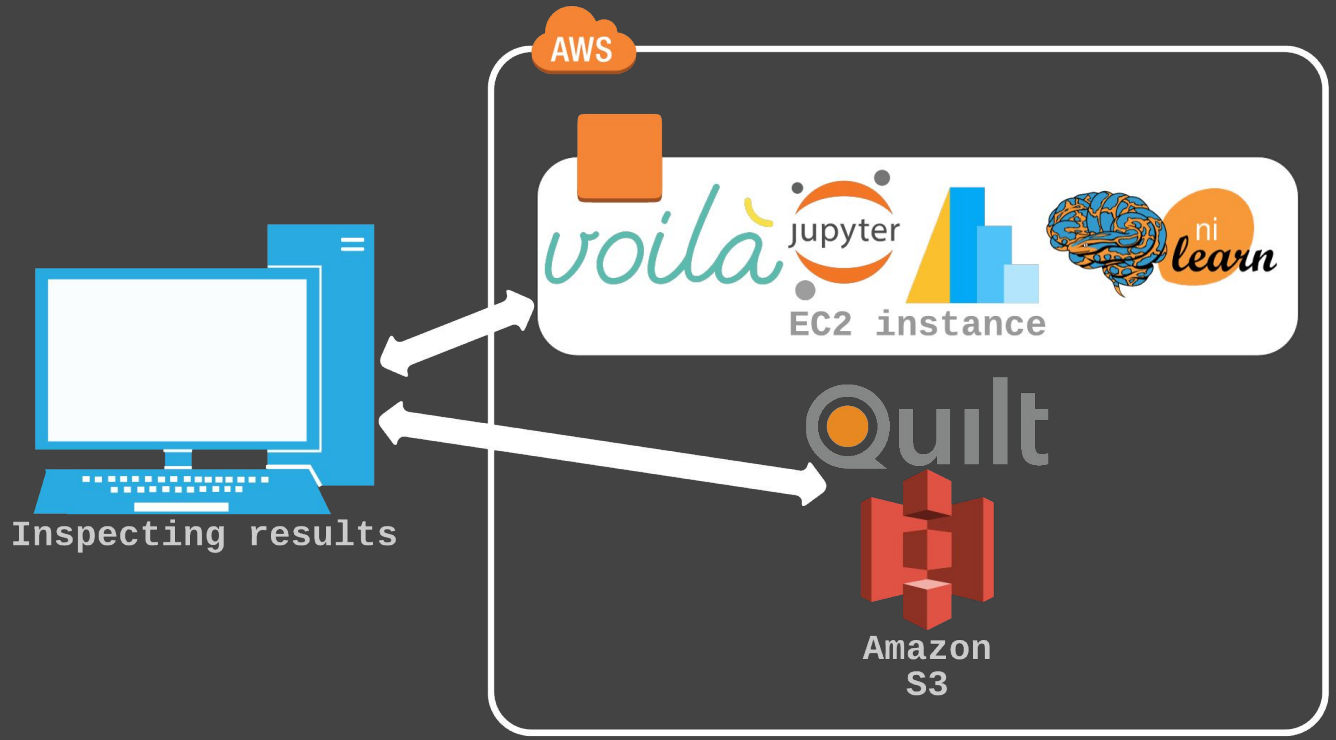
REPRO-DUCIBILITY

EXPLORE DATA

SUMMARY

DEMO

Cloud friendly ***Jupyter***-based ***ecosystem*** for exploring results



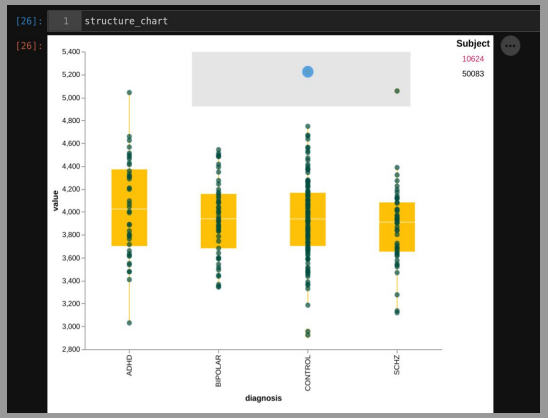
AI IN NEURO

REPRO-DUCIBILITY

EXPLORE DATA

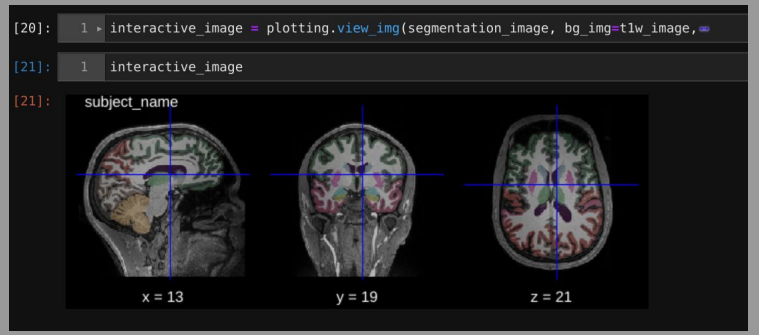
SUMMARY

DEMO



Altair

ni learn



Visual pattern mining and ***brain imaging inspection*** in the notebook, without moving large amounts of data

Establish ***best practices*** where exact version of ***data, code and environment*** are published along with specific ***documentation***

Bring you code and visualization tools to your data, not the other way around

Available now on GitHub! corticometrics/rend

11

AI IN NEURO

REPRO-DUCIBILITY

EXPLORE DATA

SUMMARY

DEMO

Acknowledgments

- Anne Devan-Song (@amphibianne) for editing and design
- Kevin Moore and Aneesh Karve from Quilt for feedback
- Nick Schmansky from CorticoMetrics for review
- Funding: NIH NIA (R42AG062026)

Demo

Using a Quilt catalog as landing page for an interactive brain image inspection dashboard