



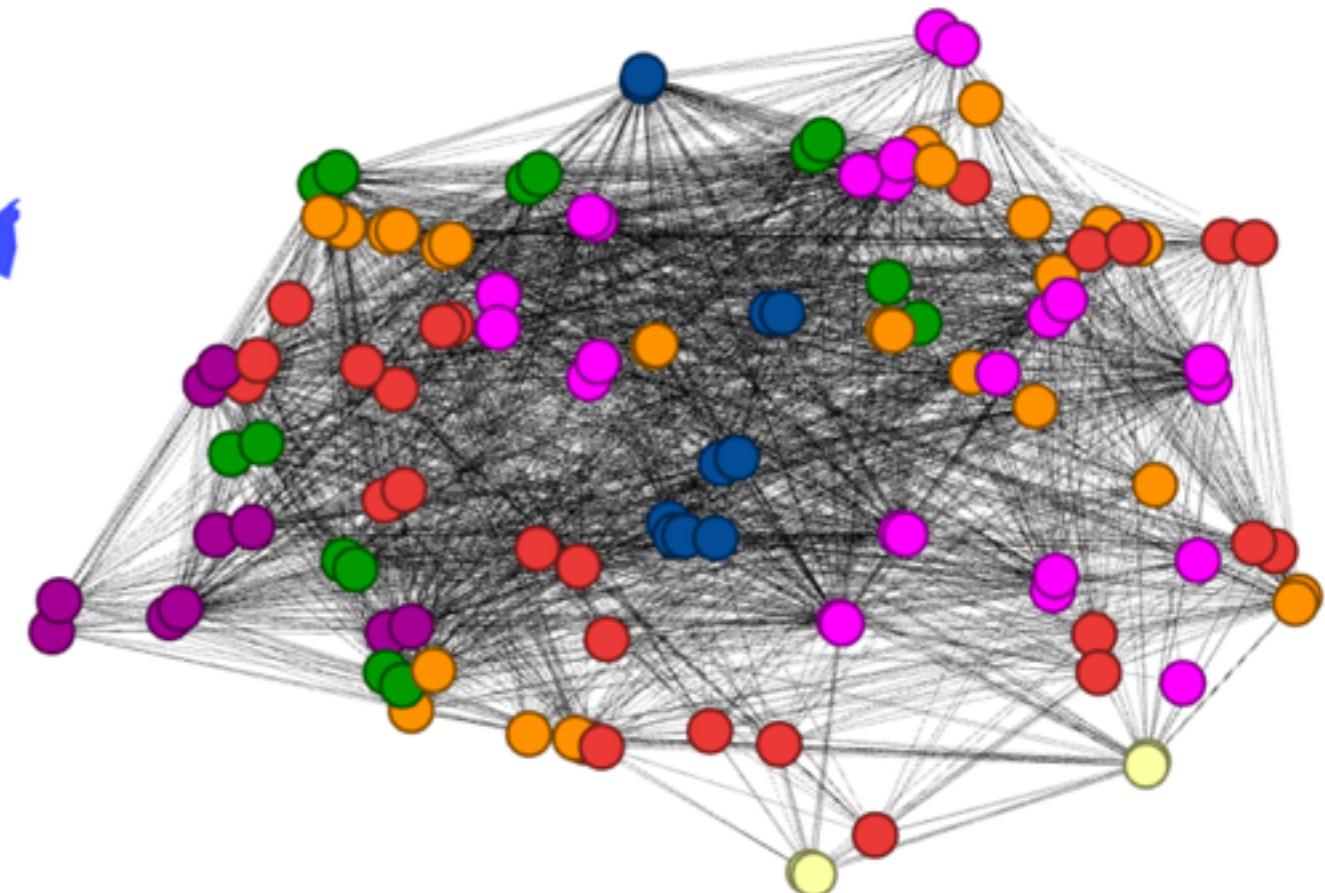
<https://github.com/zuoxinian/CoRR>



http://fcon_1000.projects.nitrc.org/indi/CoRR/html/index.html

Data Descriptor | [OPEN](#)

An open science resource for establishing reliability and reproducibility in functional connectomics



Author's corner: A testbed
for reproducible and
standardized human MRI
connectomics



国际信度与可重复性联盟现状

Consortium for Reliability and Reproducibility

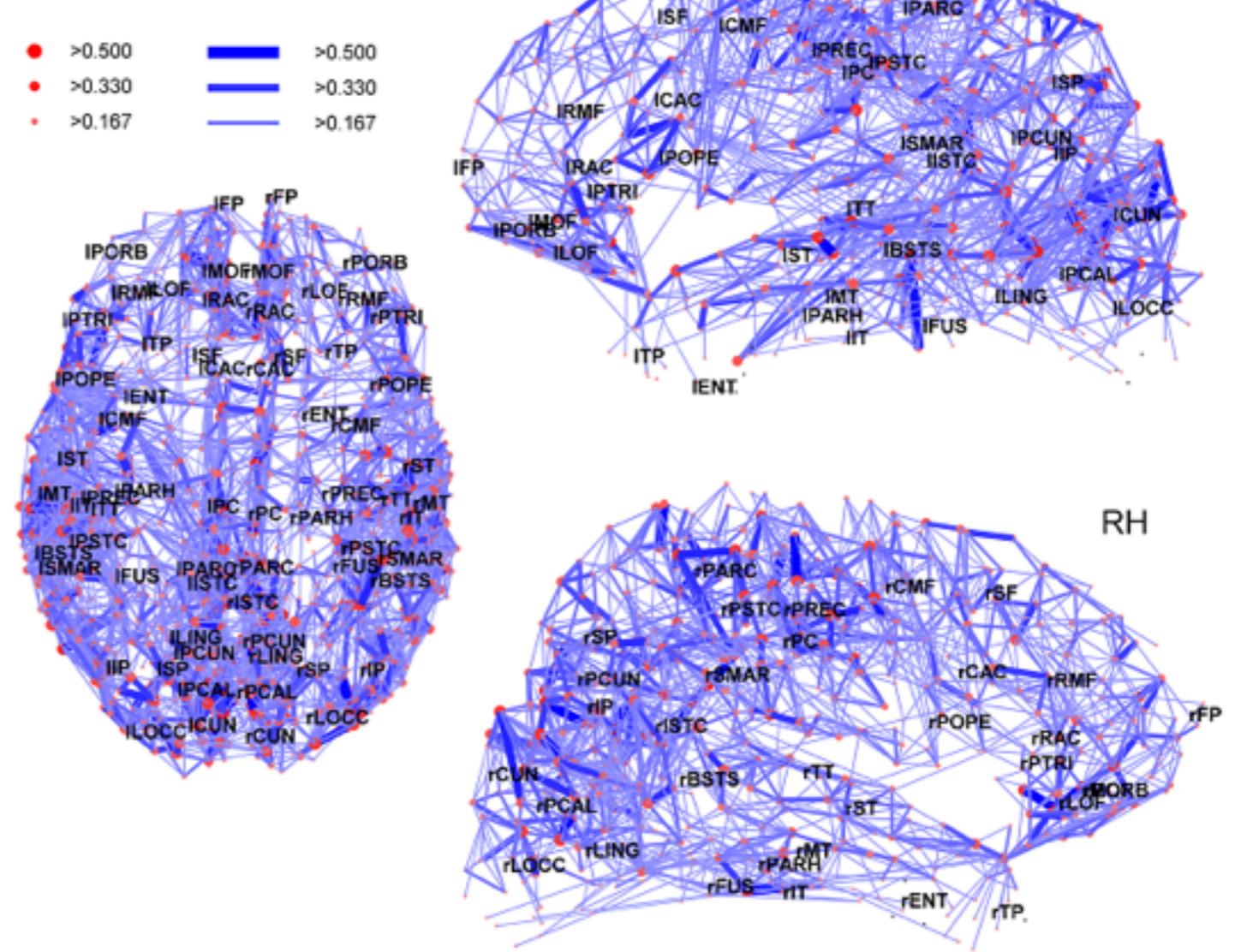
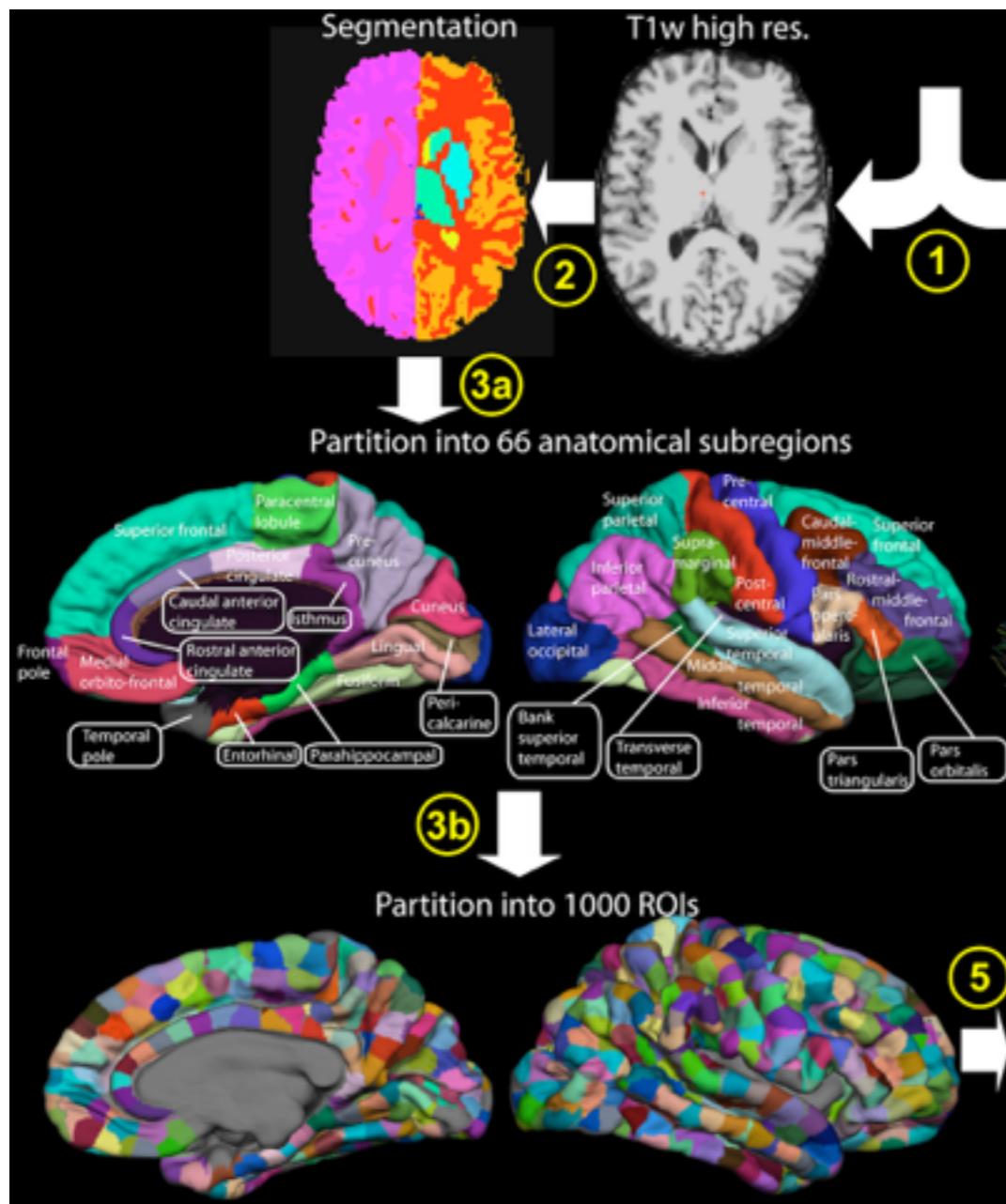
左西年



人脑连接组学历史

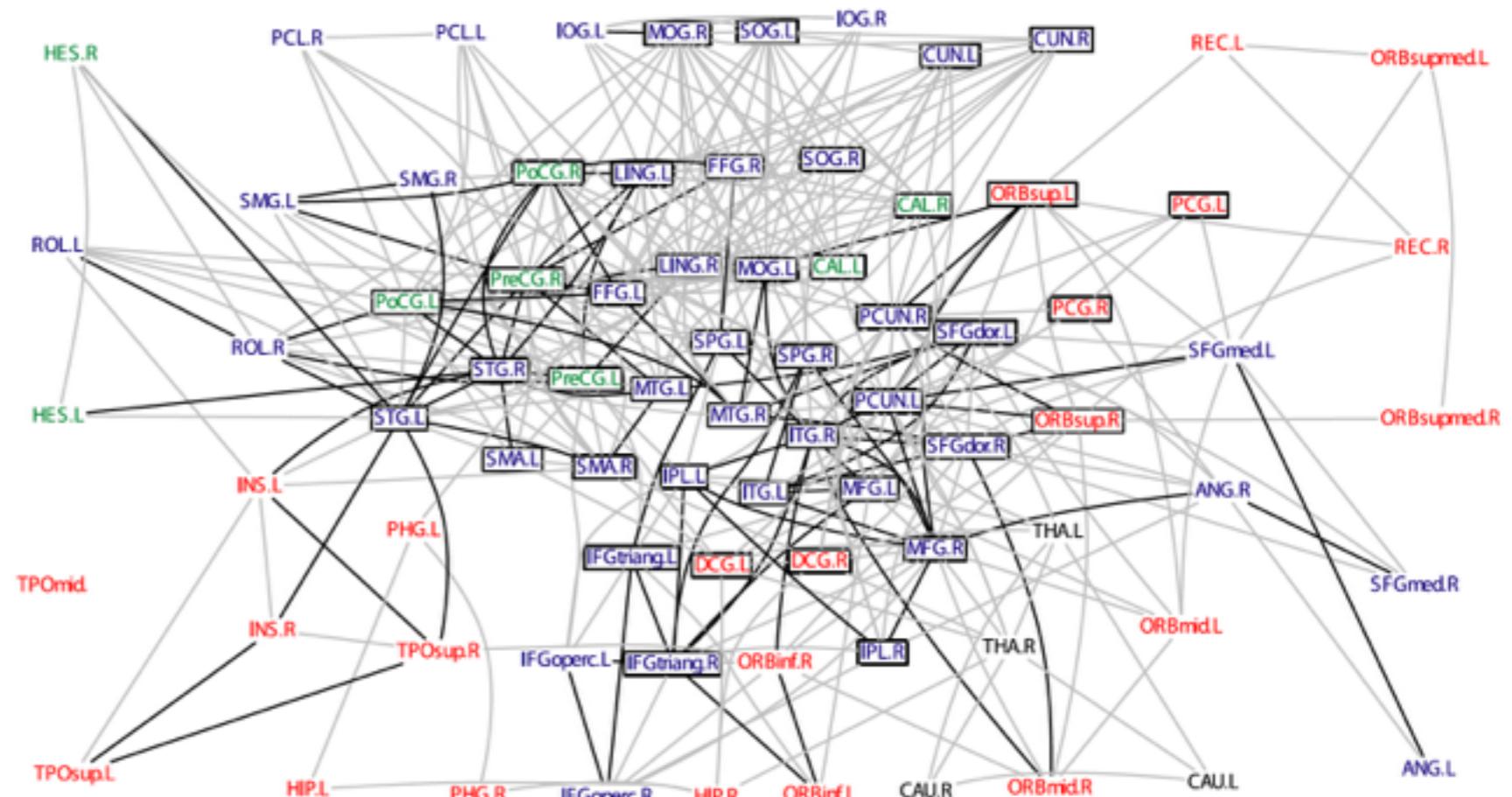
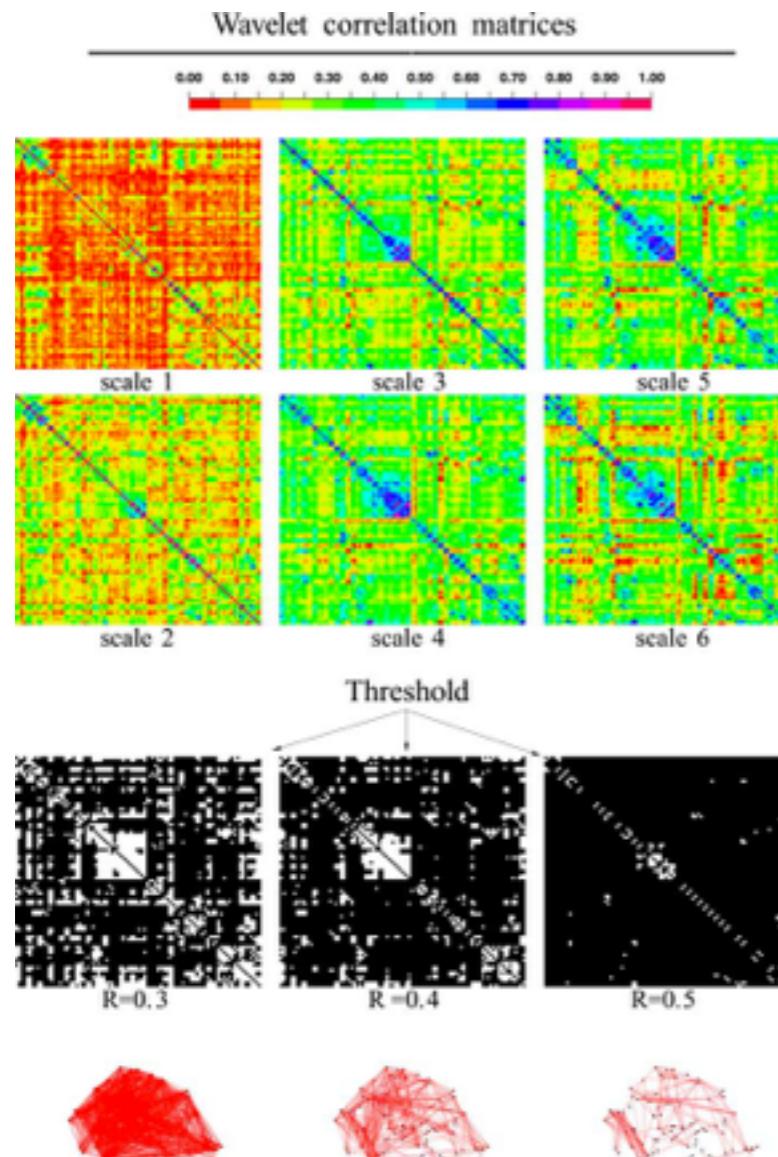
人脑连接组学提出：结构连接组

PLoS Computational Biology, 2005; PLoS Biology, 2008.



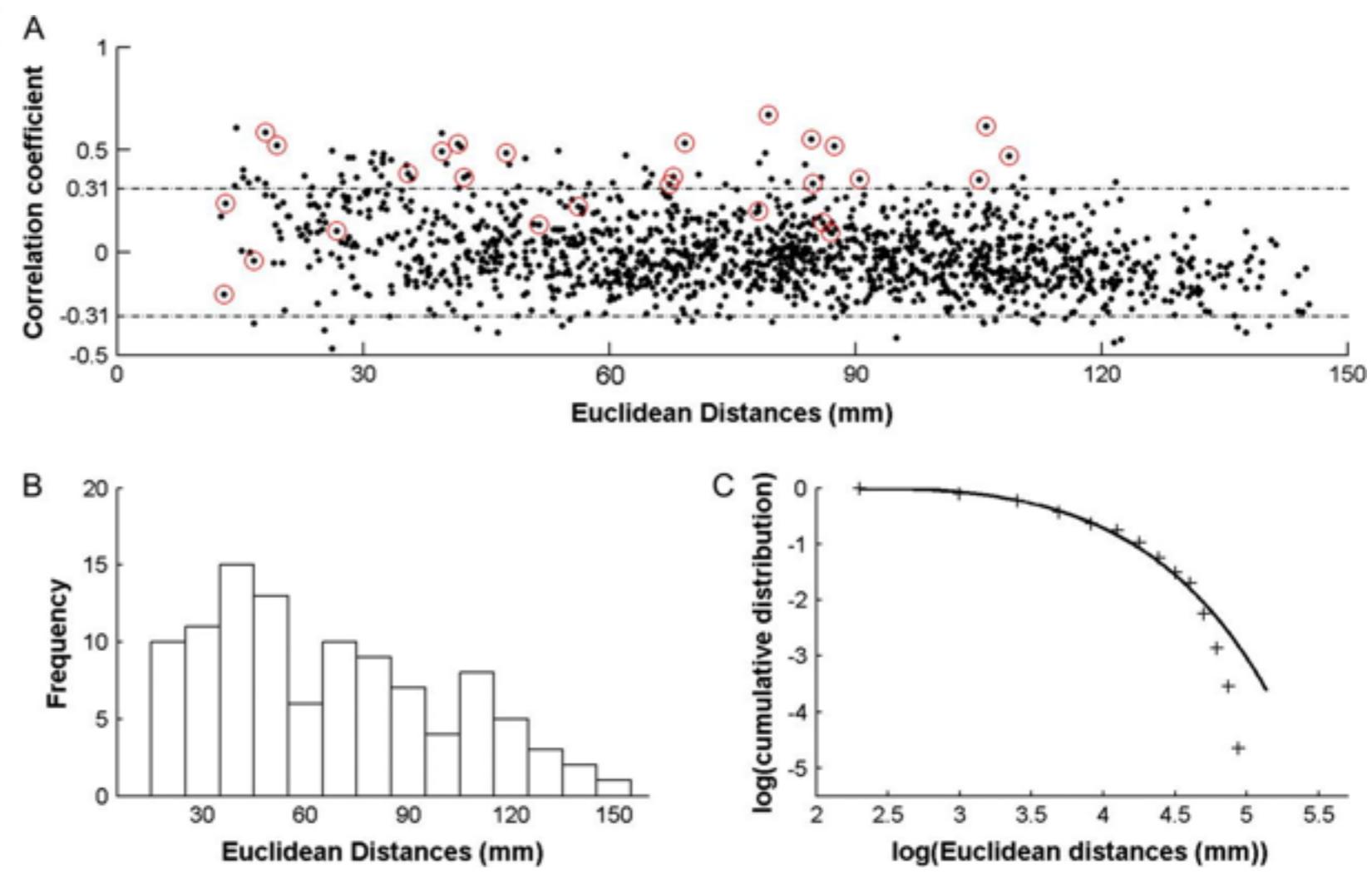
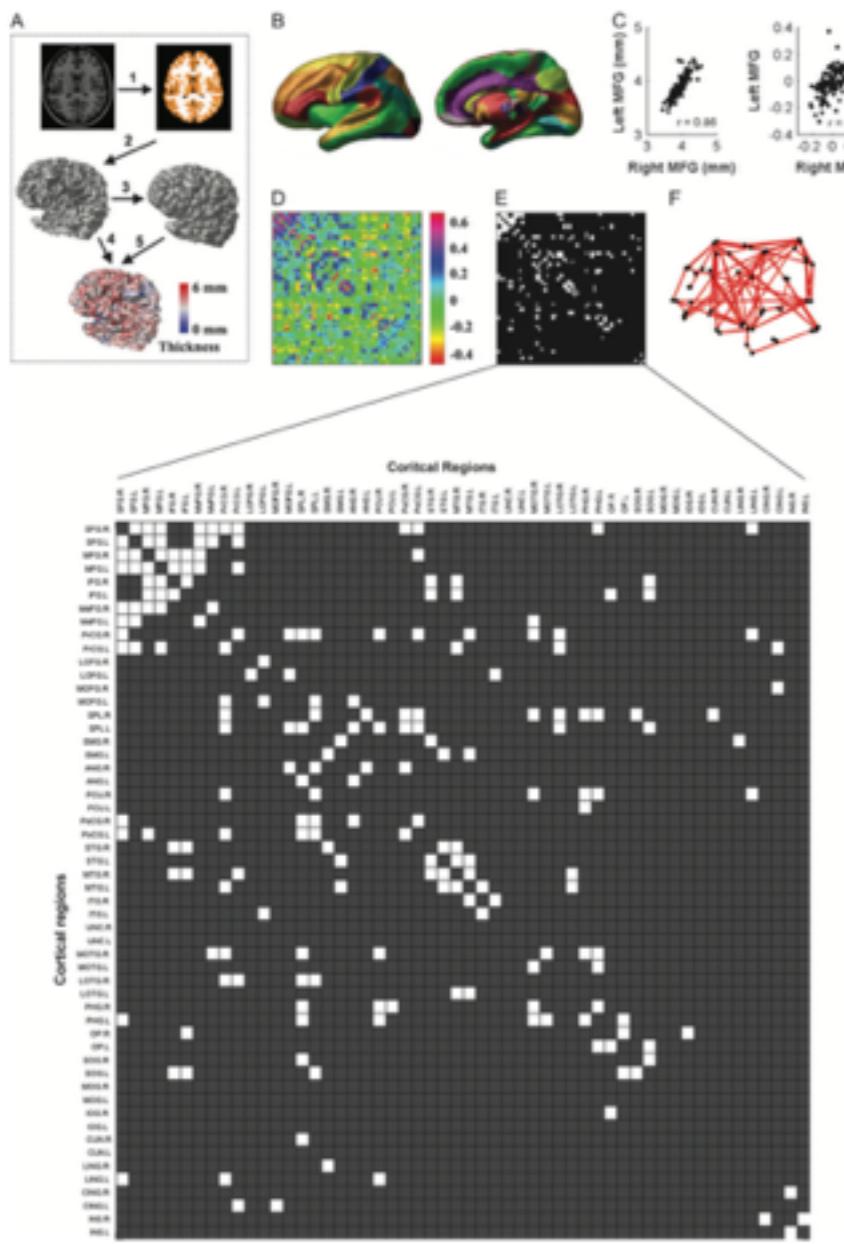
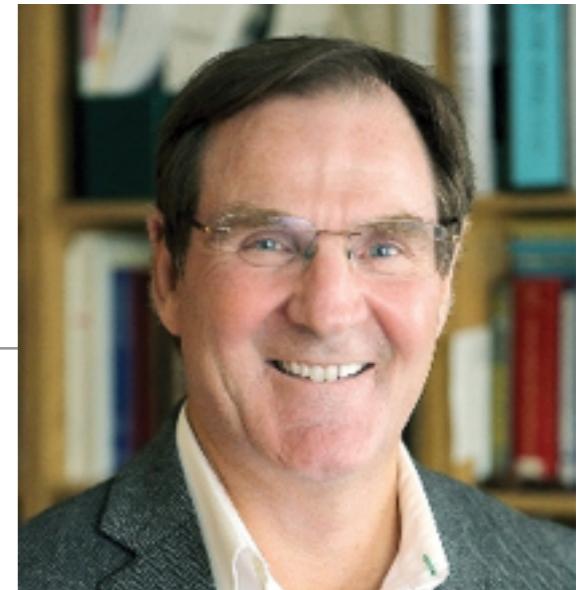
人脑功能连接组

The Journal of Neuroscience, 2006; PNAS, 2010.



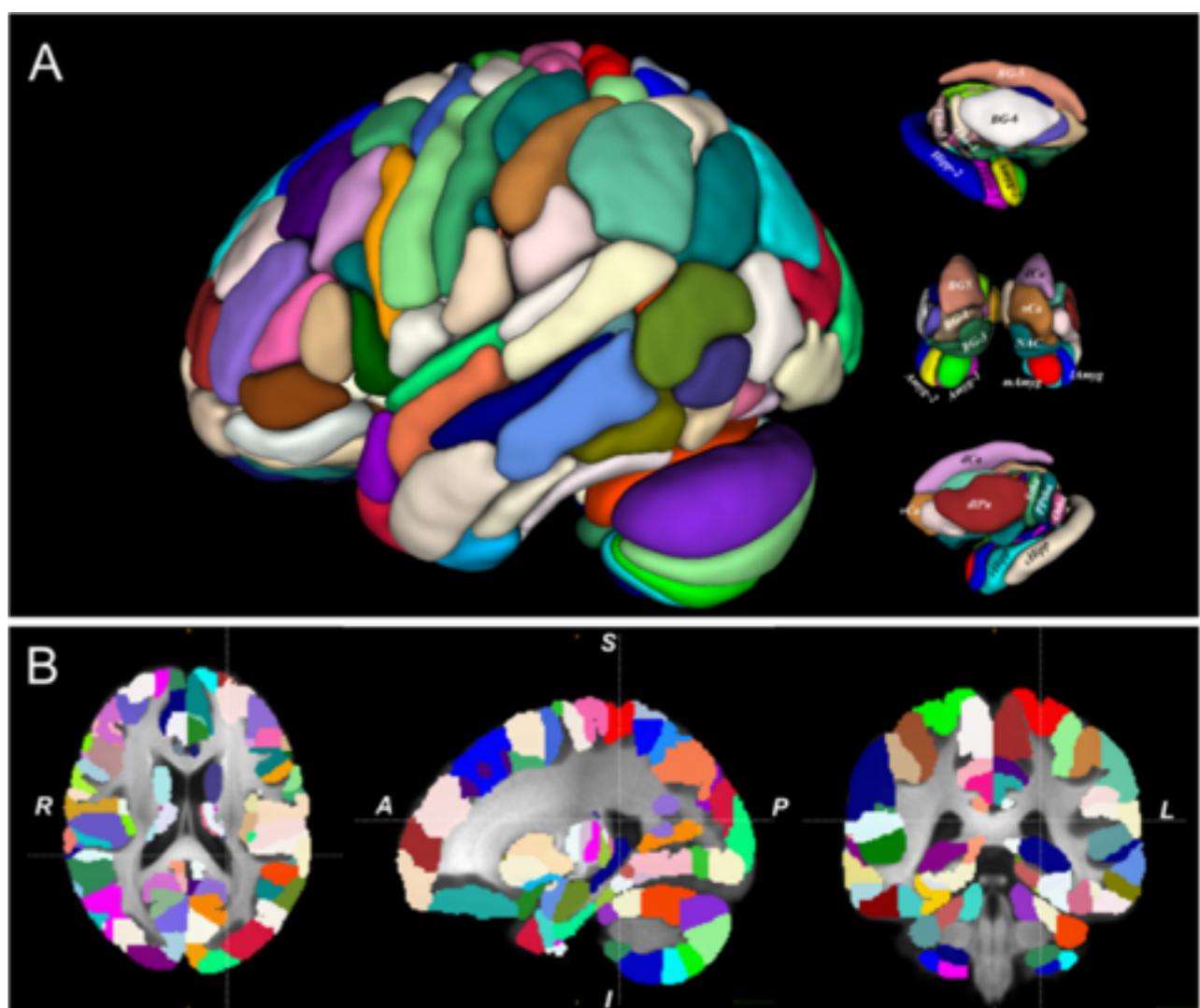
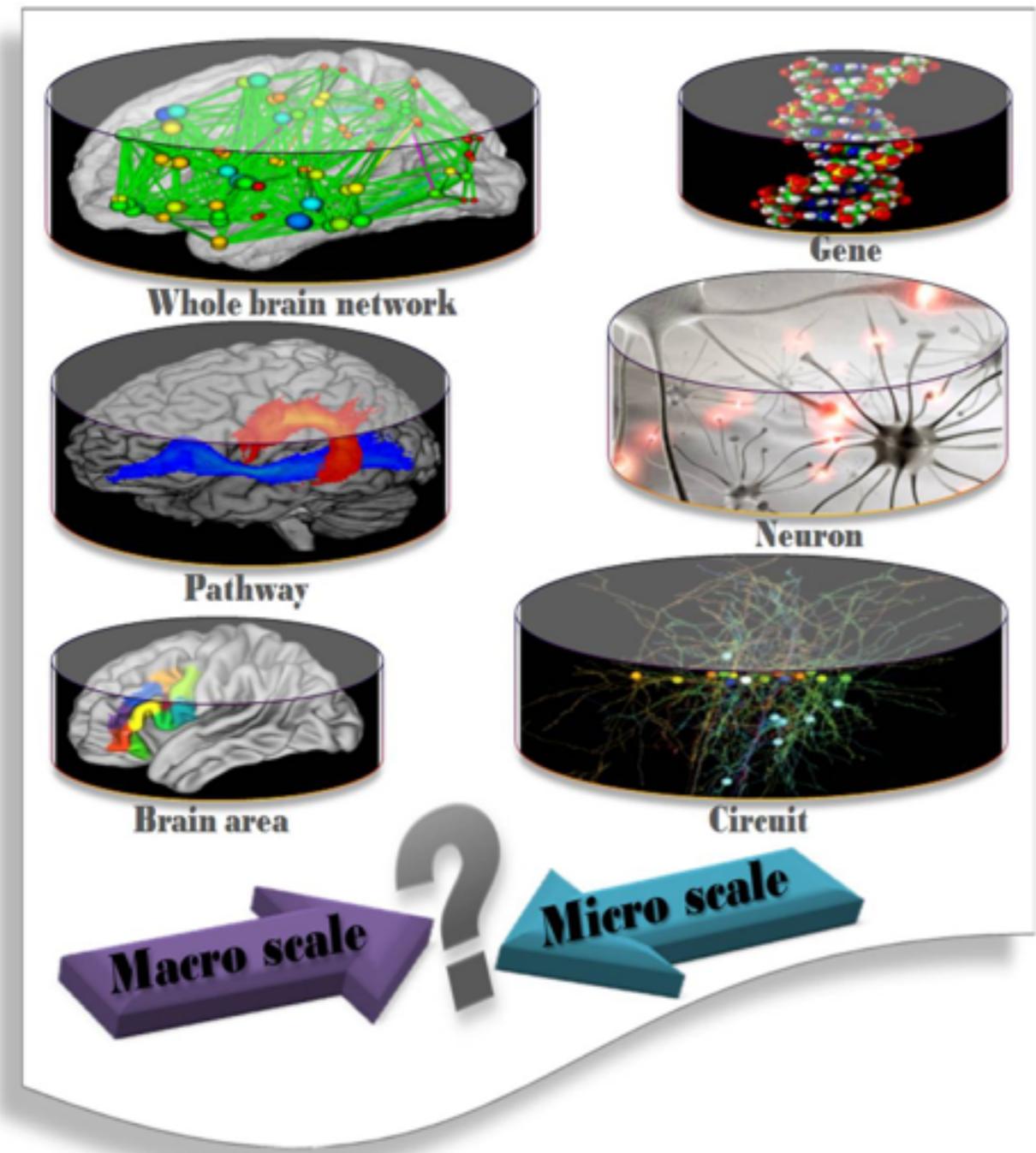
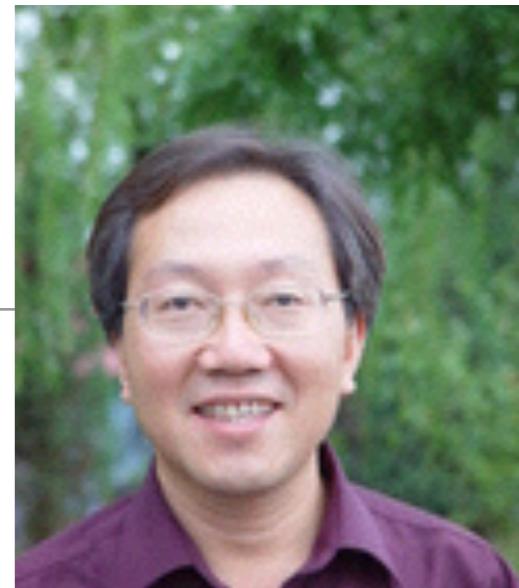
人脑形态连接组

Cerebral Cortex, 2007; NeuroImage 2013.



人脑网络组(Brainnetome)

PLoS Computational Biology, 2010; Cerebral Cortex 2016.



人脑连接组学局限与挑战

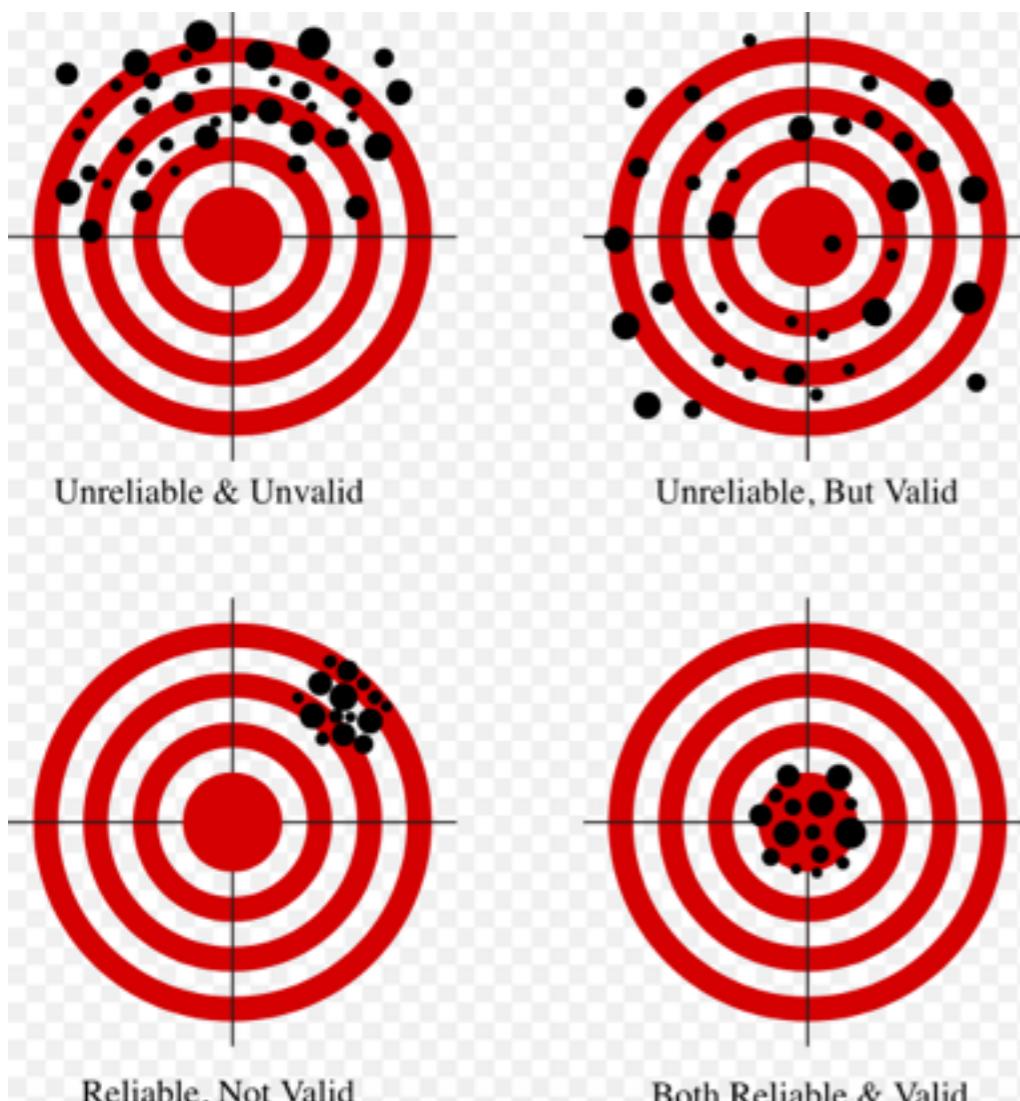
1. 缺乏金标准
2. 多学科交叉
3. 大数据挖掘
4. 无基础理论



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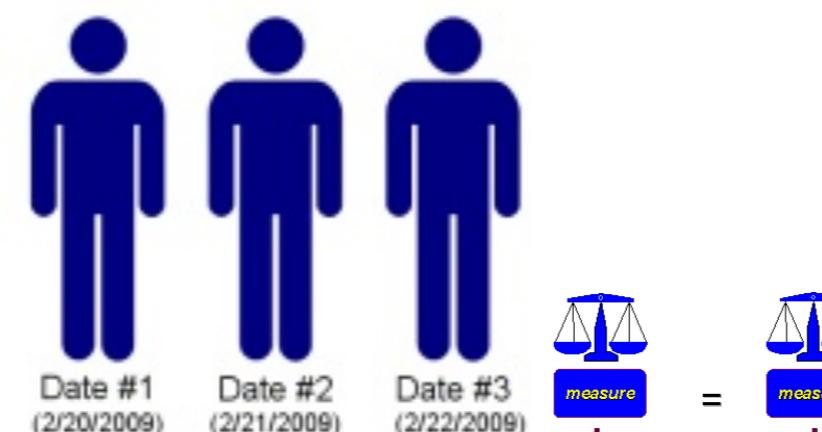


The Reliability of Clinical Diagnoses: State of the Art

Helena Chmura Kraemer

Department of Psychiatry and Behavioral Sciences, Stanford University (Emerita), Palo Alto, California 94301; and Department of Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania 15213; email: hckhome@pacbell.net

Concept: Reliability and Validity



$$A' = A + n(A)$$

$$B' = B + n(B)$$

$$r(A', B') = r(A, B) \sqrt{ICC(A)ICC(B)}$$

ICC

Slight

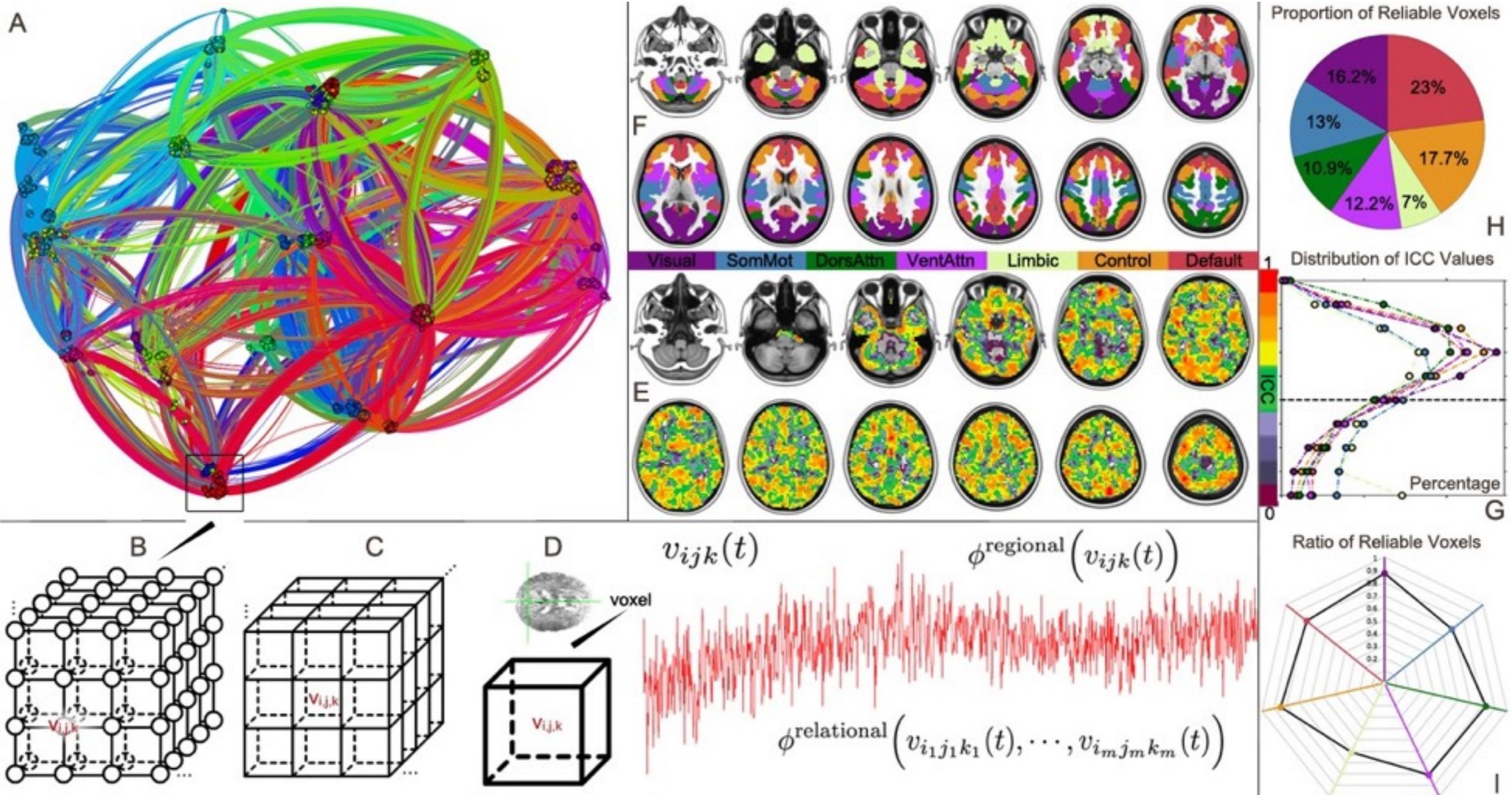
Fair

Moderate

Substantial

Almost Perfect

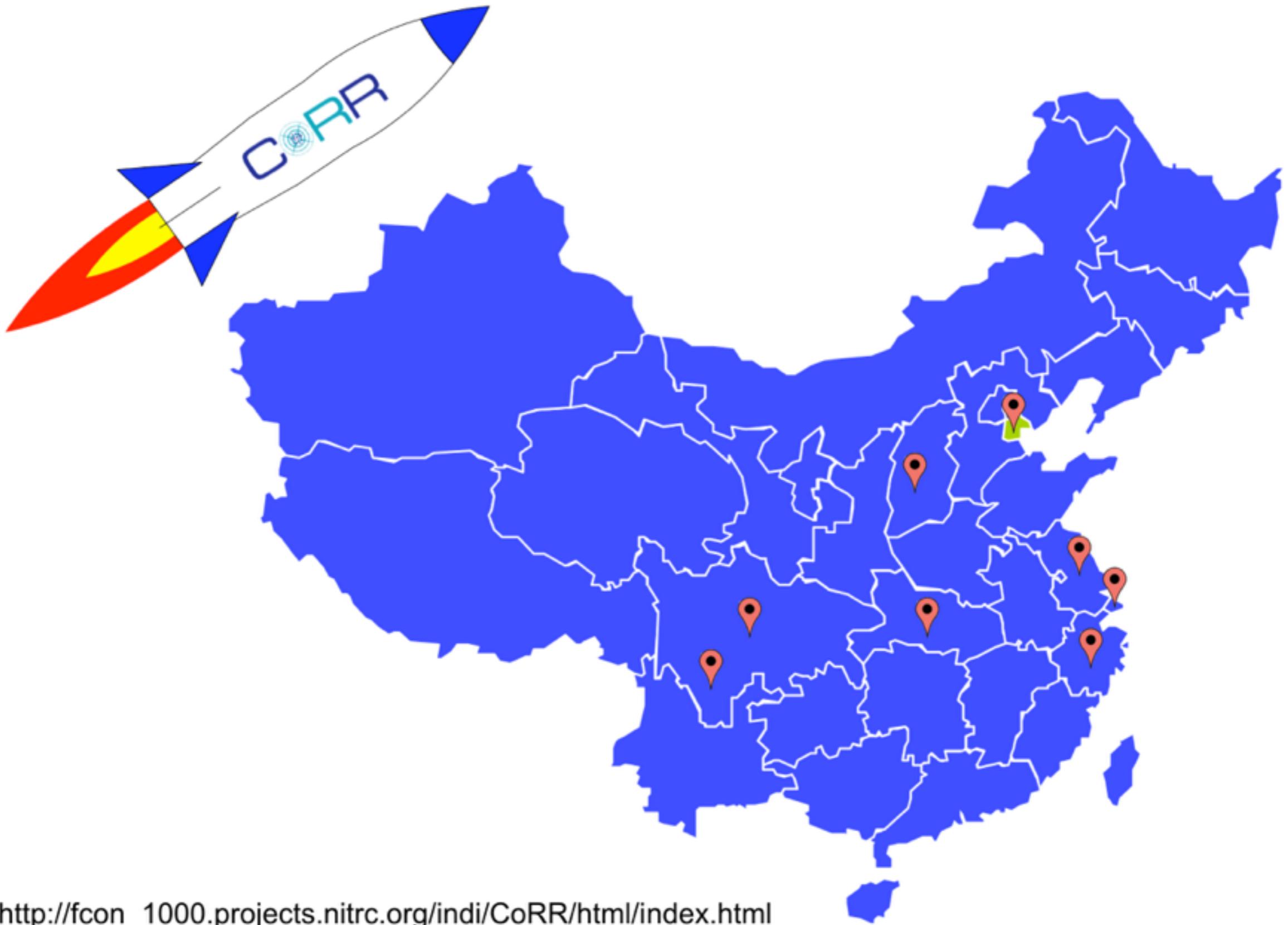
人脑功能连接组: A Meta-Reliability Analysis



CoRR: Consortium for Reliability and Reproducibility

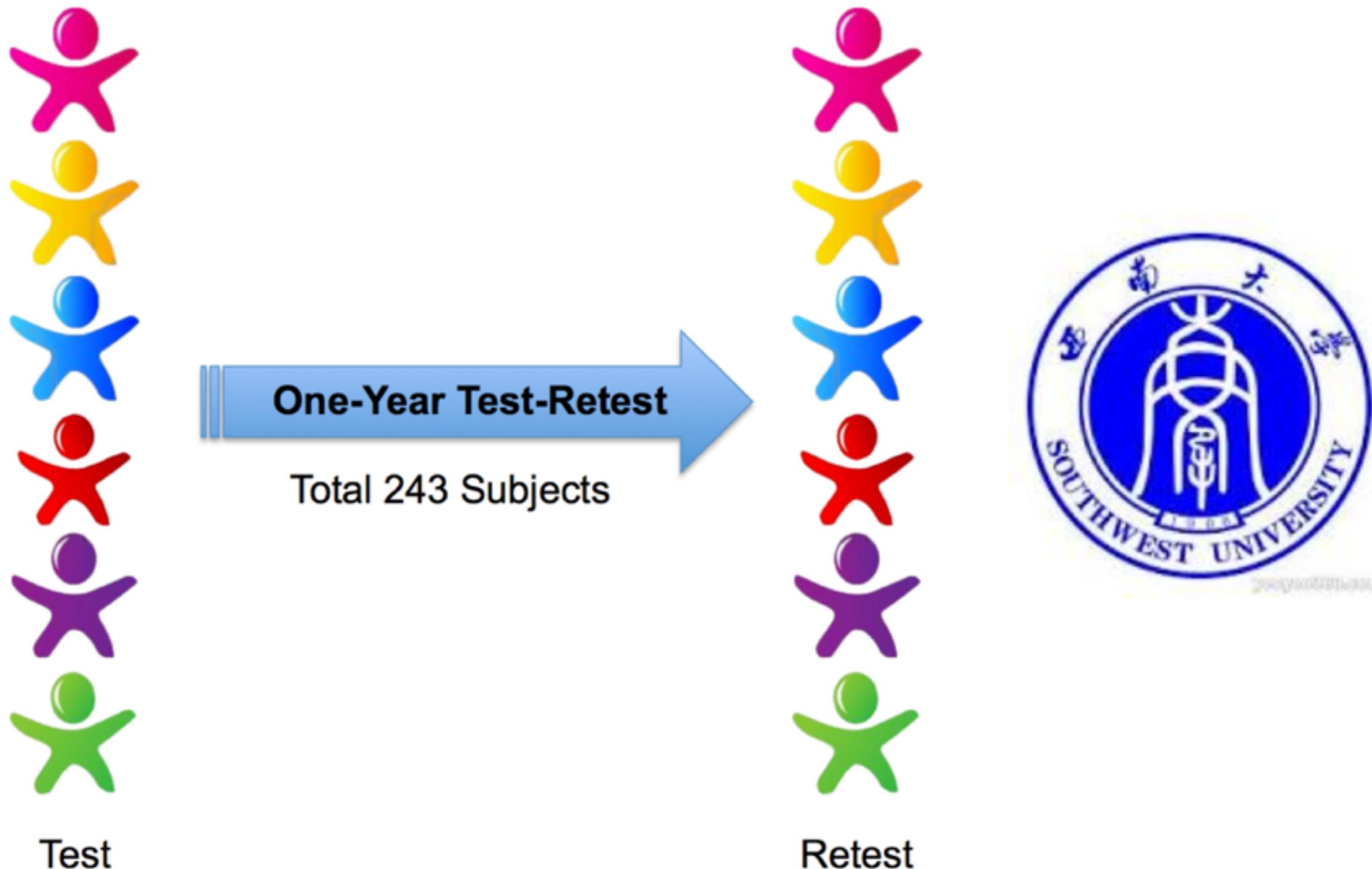


CoRR: Consortium for Reliability and Reproducibility

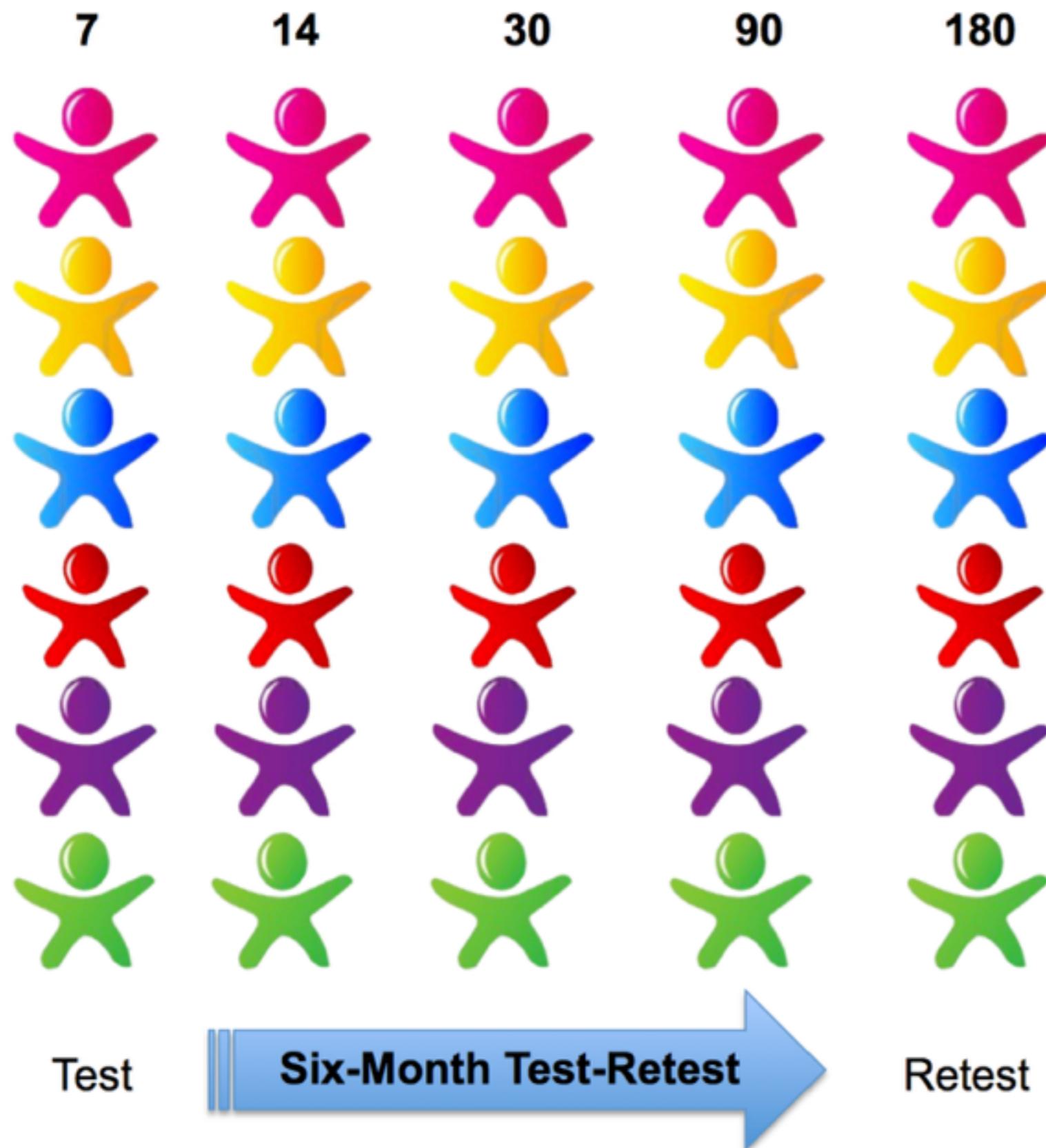


http://fcon_1000.projects.nitrc.org/indi/CoRR/html/index.html

CoRR: Consortium for Reliability and Reproducibility

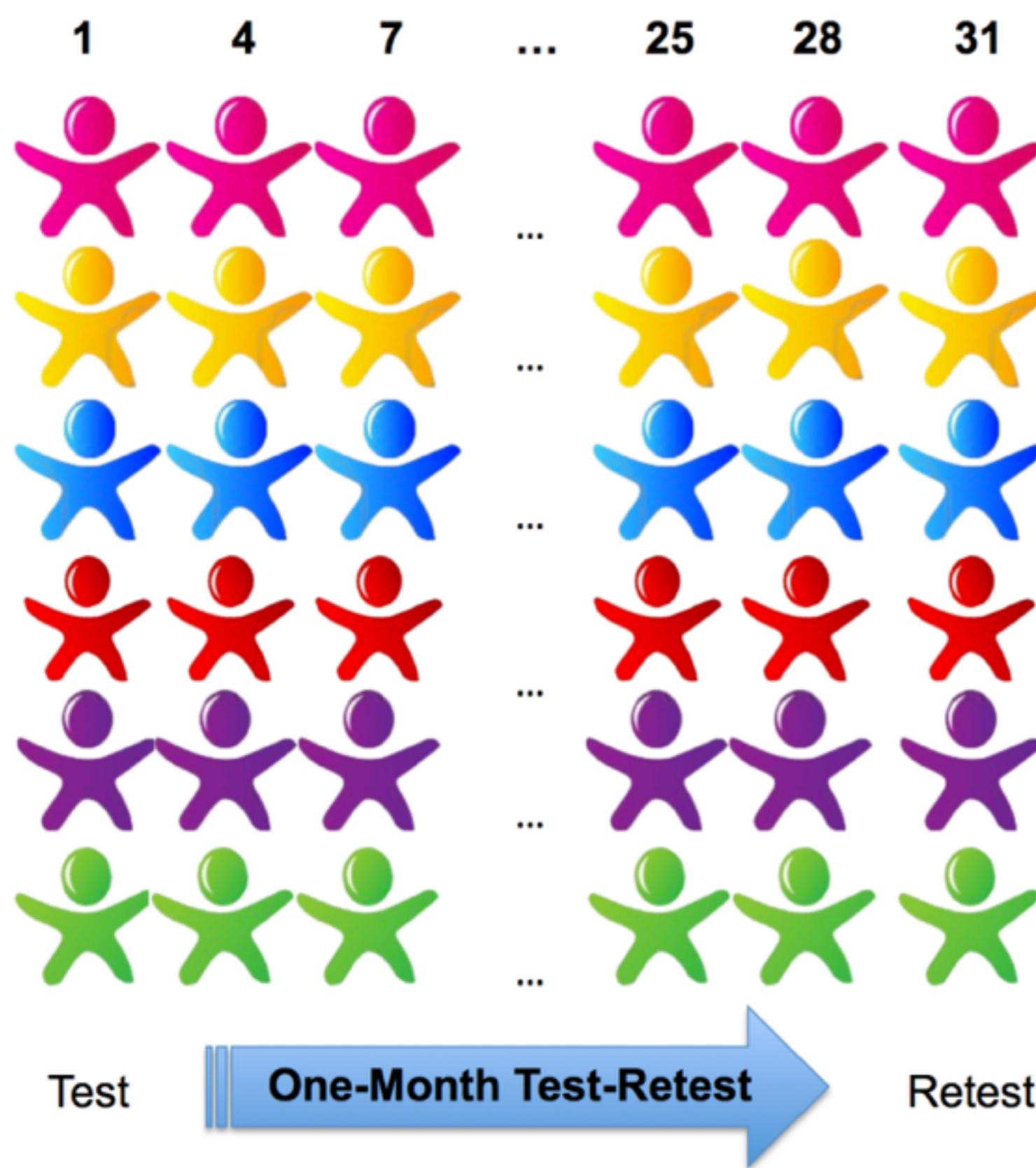


CoRR: Consortium for Reliability and Reproducibility



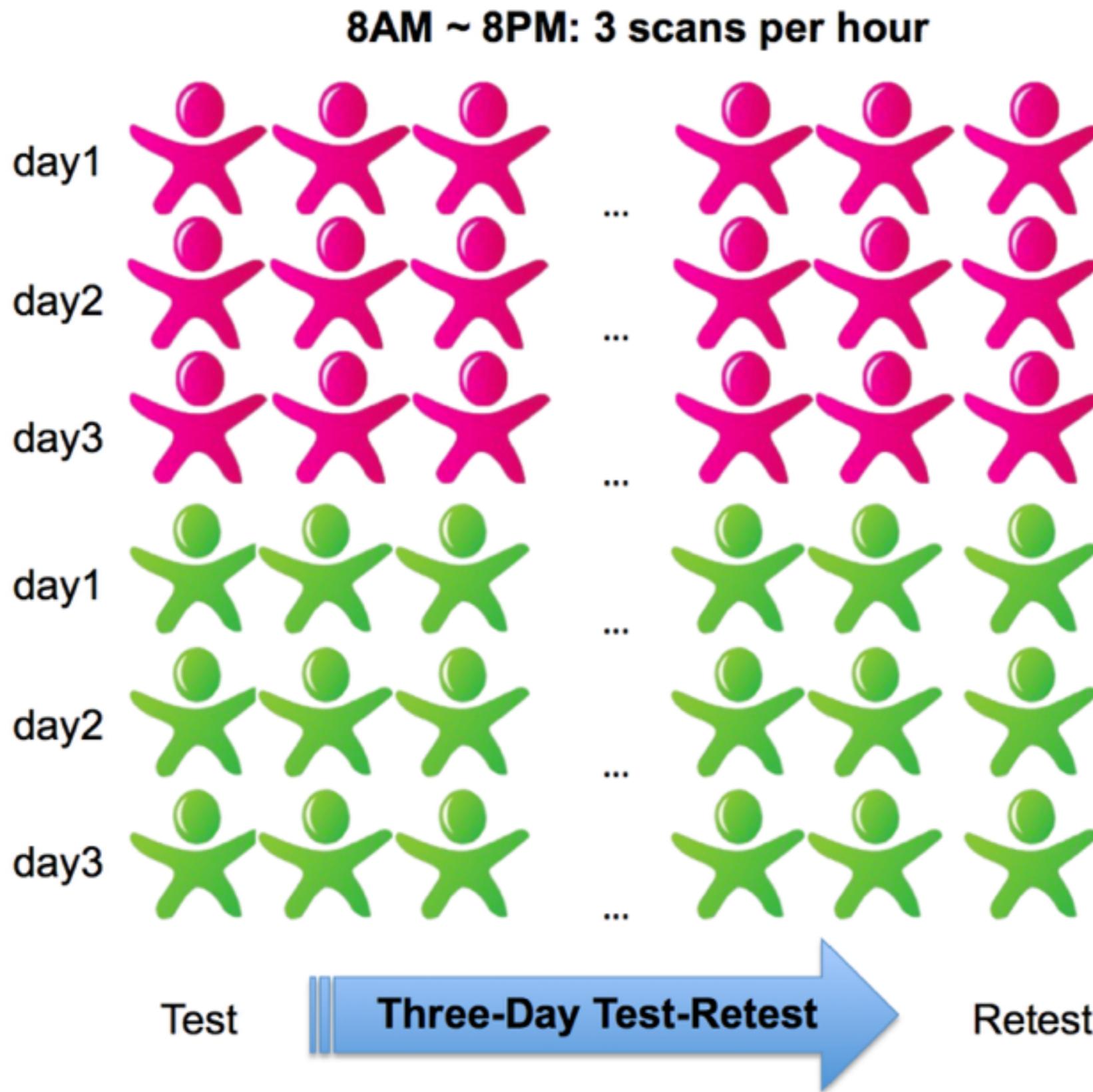
Xuanwu Hospital
Capital Medical University

CoRR: Consortium for Reliability and Reproducibility

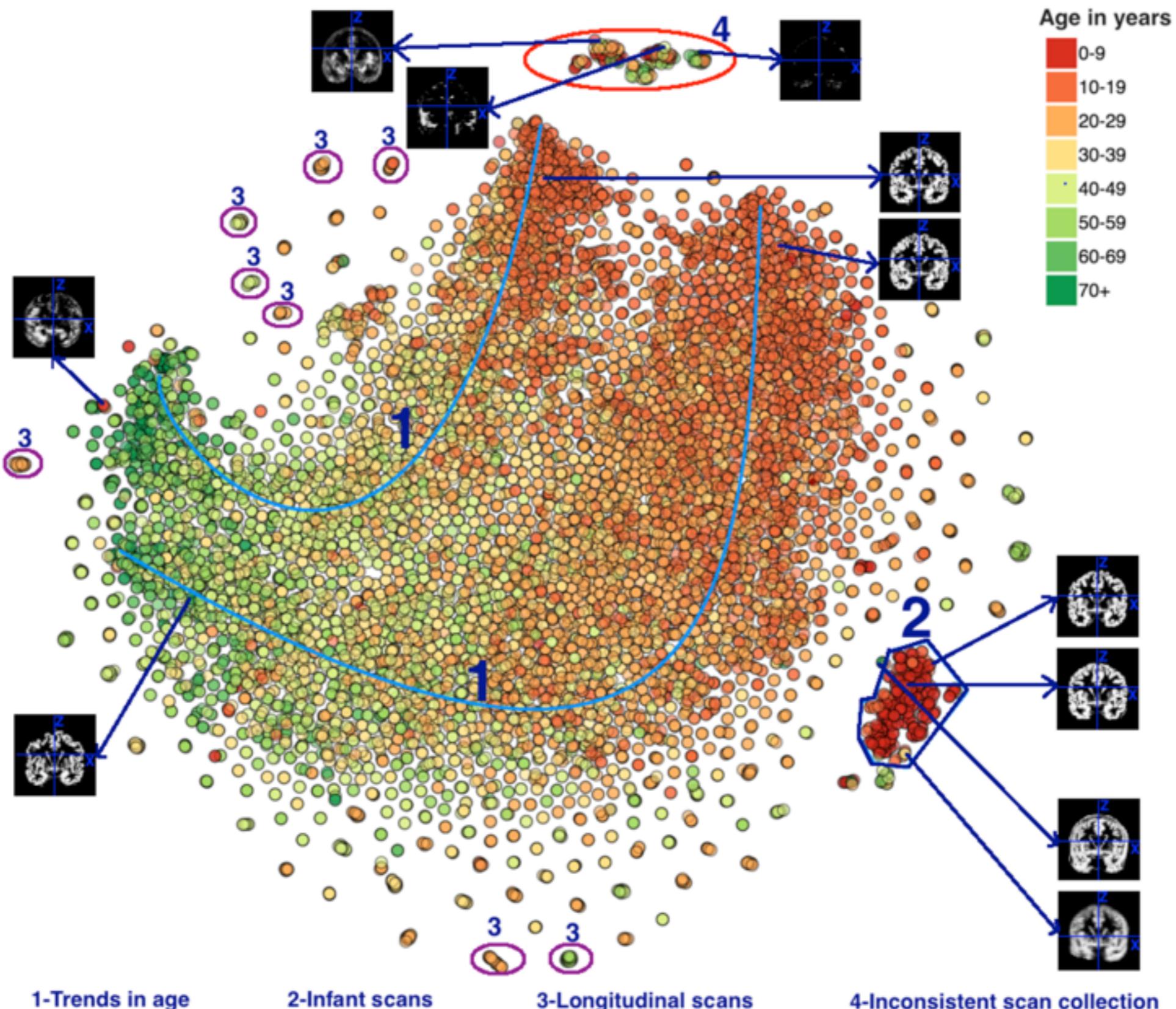


杭州师范大学
认知与脑疾病研究中心
Center for Cognition and Brain Disorders

CoRR: Consortium for Reliability and Reproducibility



CoRR Data Discovery: Spectrum



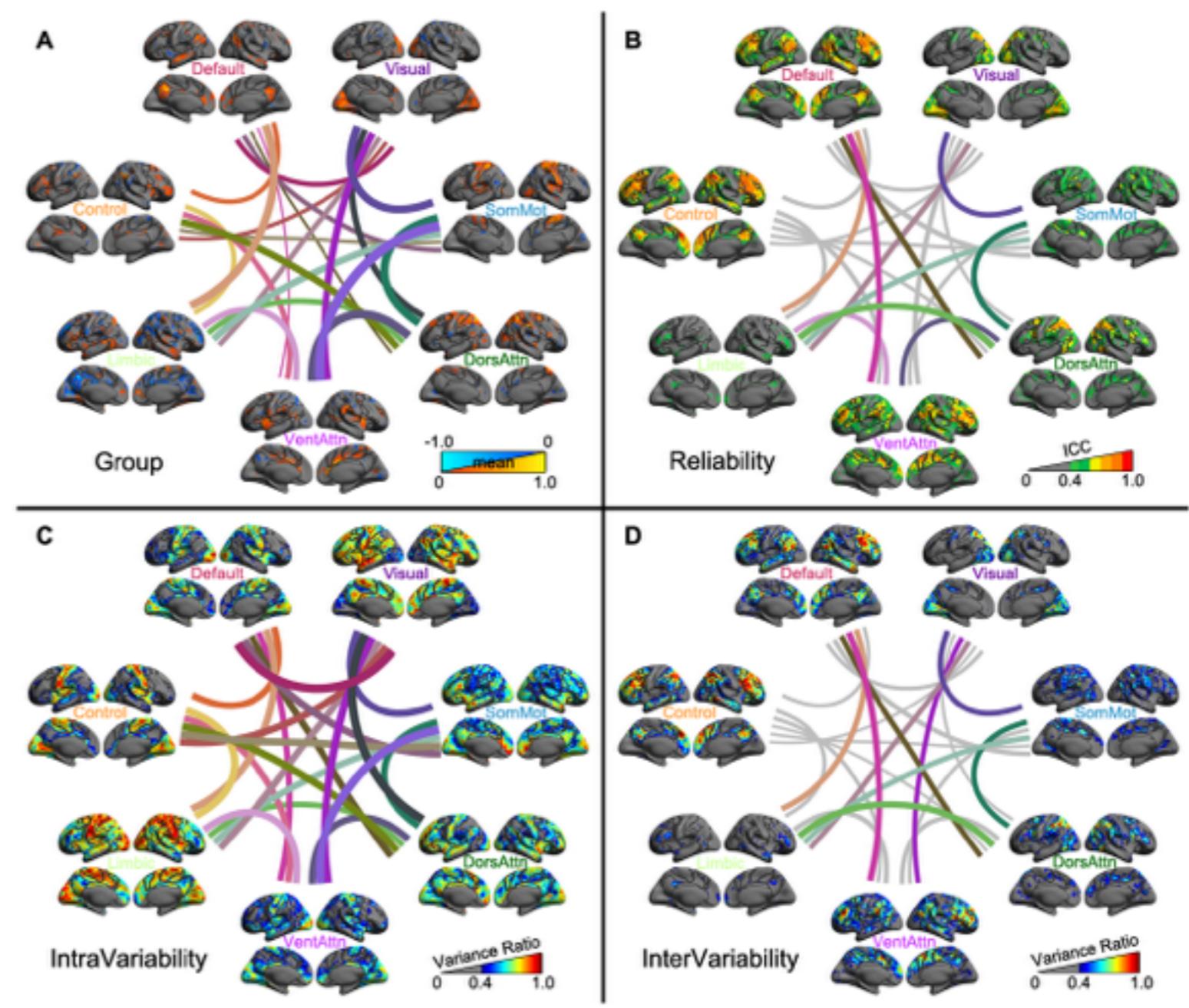
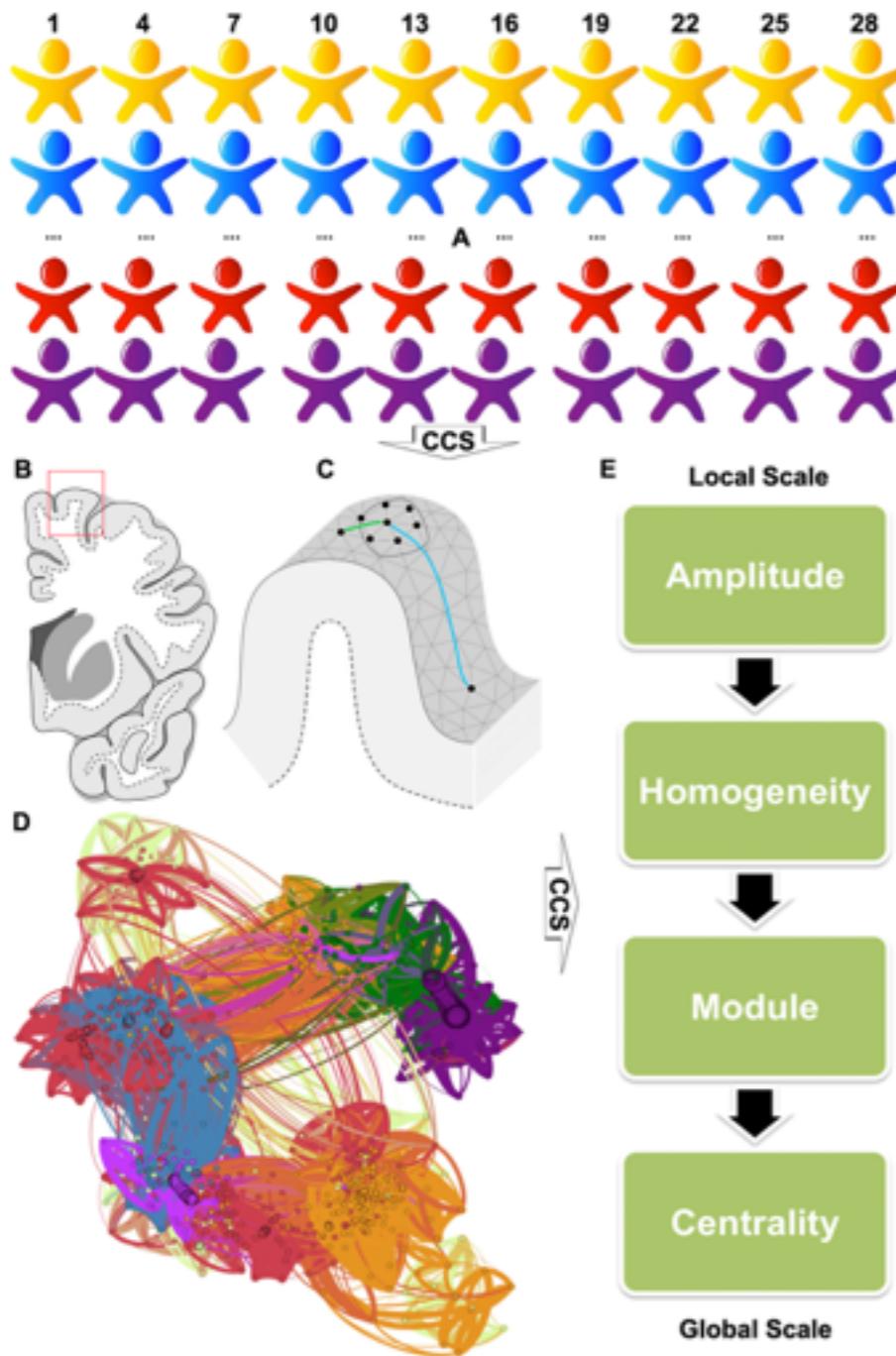
CoRR Data Discovery: Reproducibility

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Individual Variability and Test-Retest Reliability Revealed by Ten Repeated Resting-State Brain Scans over One Month

Bing Chen , Ting Xu , Changle Zhou, Luoyu Wang, Ning Yang, Ze Wang, Hao-Ming Dong, Zhi Yang, Yu-Feng Zang, Xi-Nian Zuo , Xu-Chu Weng 

Published: December 29, 2015 • <http://dx.doi.org/10.1371/journal.pone.0144963>



CoRR Data Discovery: Continuous WM Connectivity

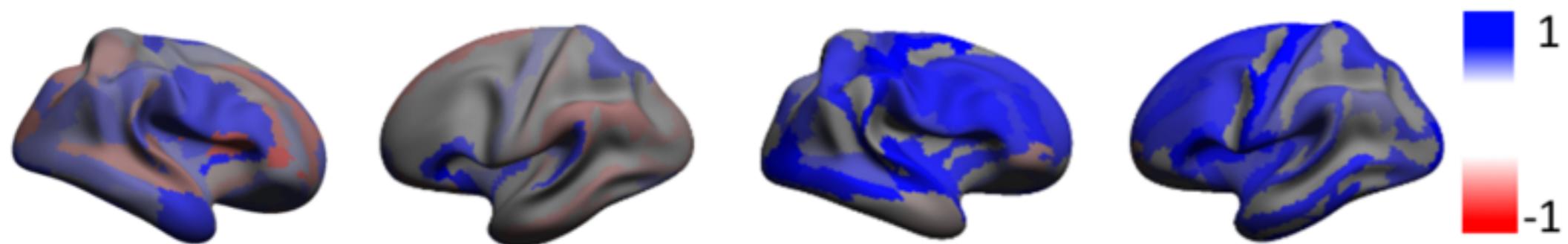


Fig. 1. A visualization of the ICC scores for connectivity to Brodmann Area 45 (Destrieux region 14) for the Count connectomes (**left**) and the proposed Integrated Intensity connectomes (**right**). **Blue** denotes a higher score.

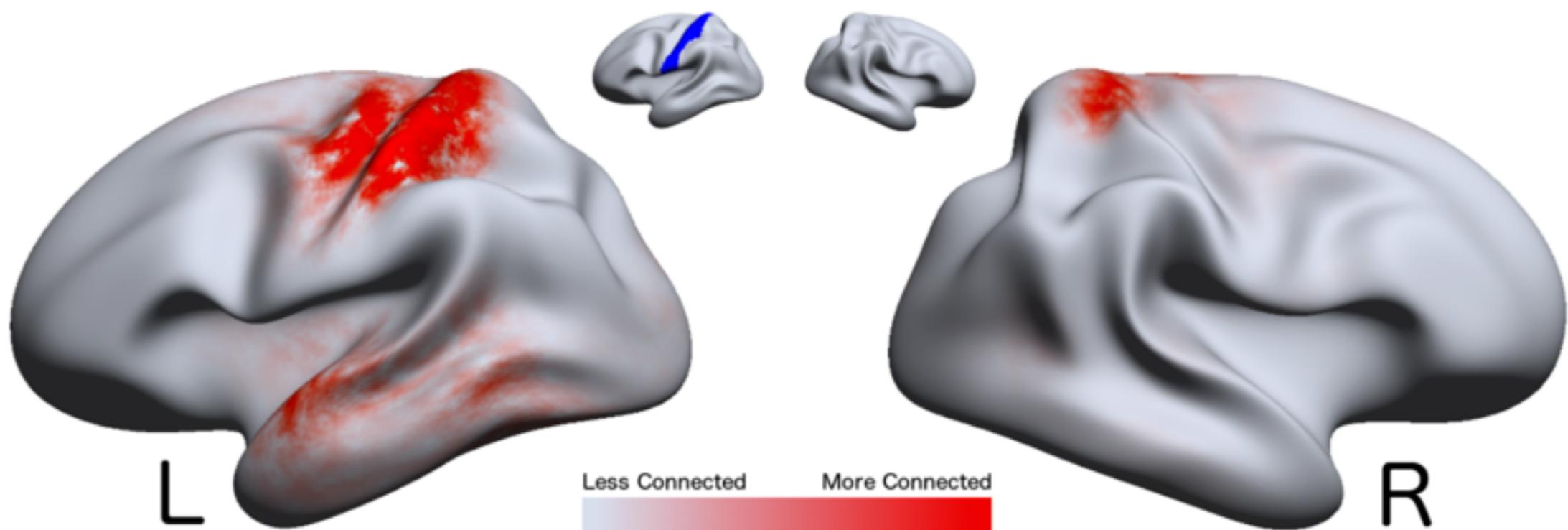
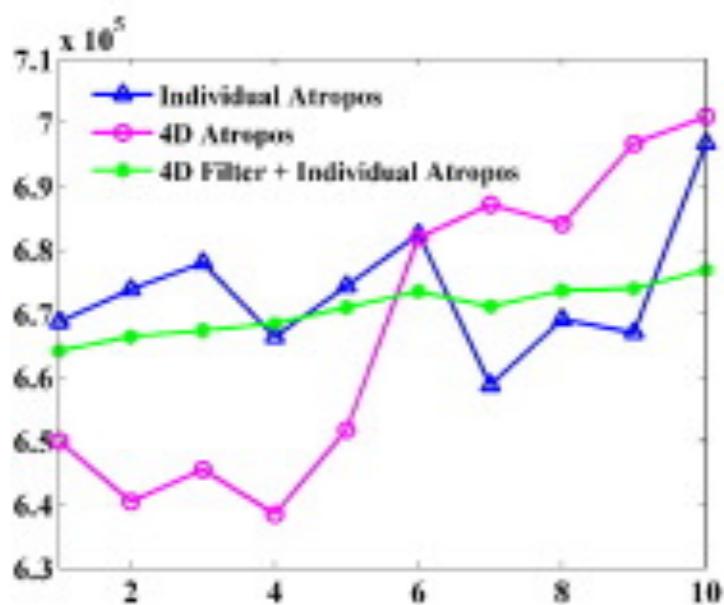


Fig. 2. A visualization of the marginal connectivity $M(x) = \int_{E_i} \hat{\lambda}(x, y) dy$ for the Left Post-central Gyrus region of the DK atlas (Region 57). The region is shown in **blue** on the inset. **Red** denotes higher connectivity regions with the **blue** region.

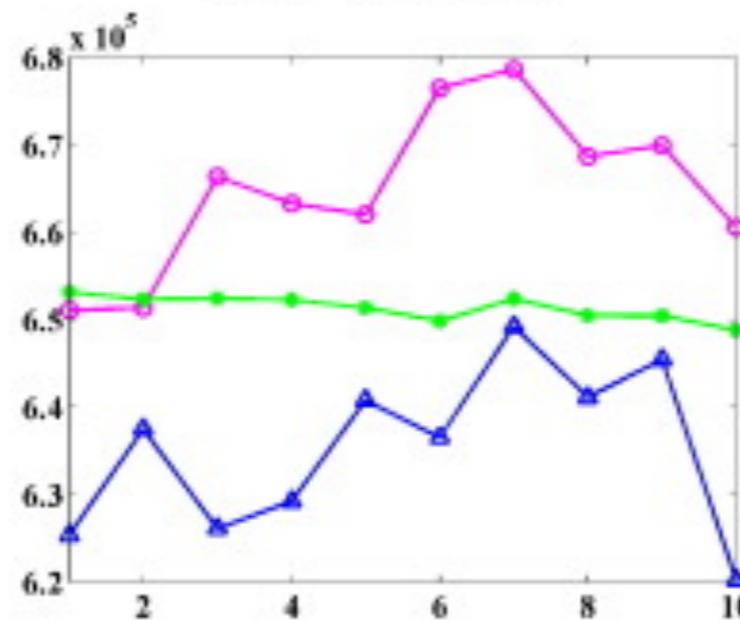
CoRR Data Discovery: 4D Image Segmentation



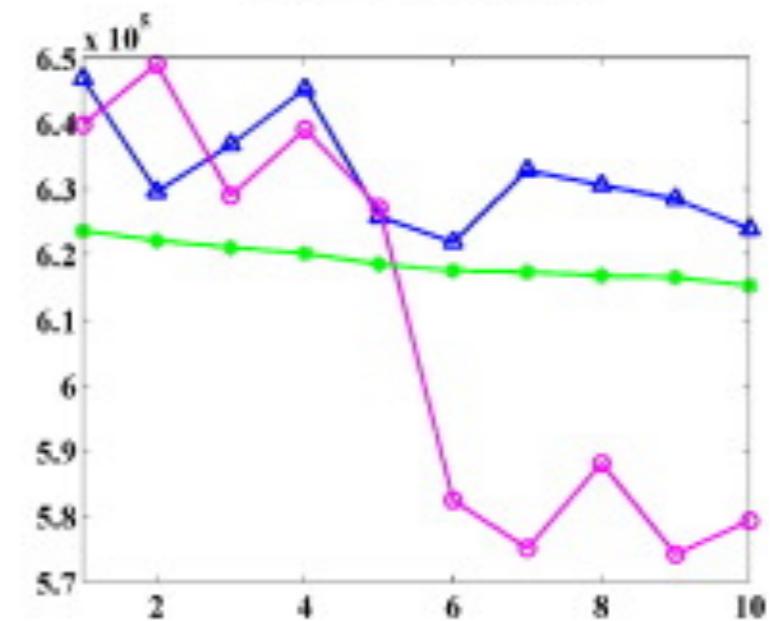
CSF VOLUME



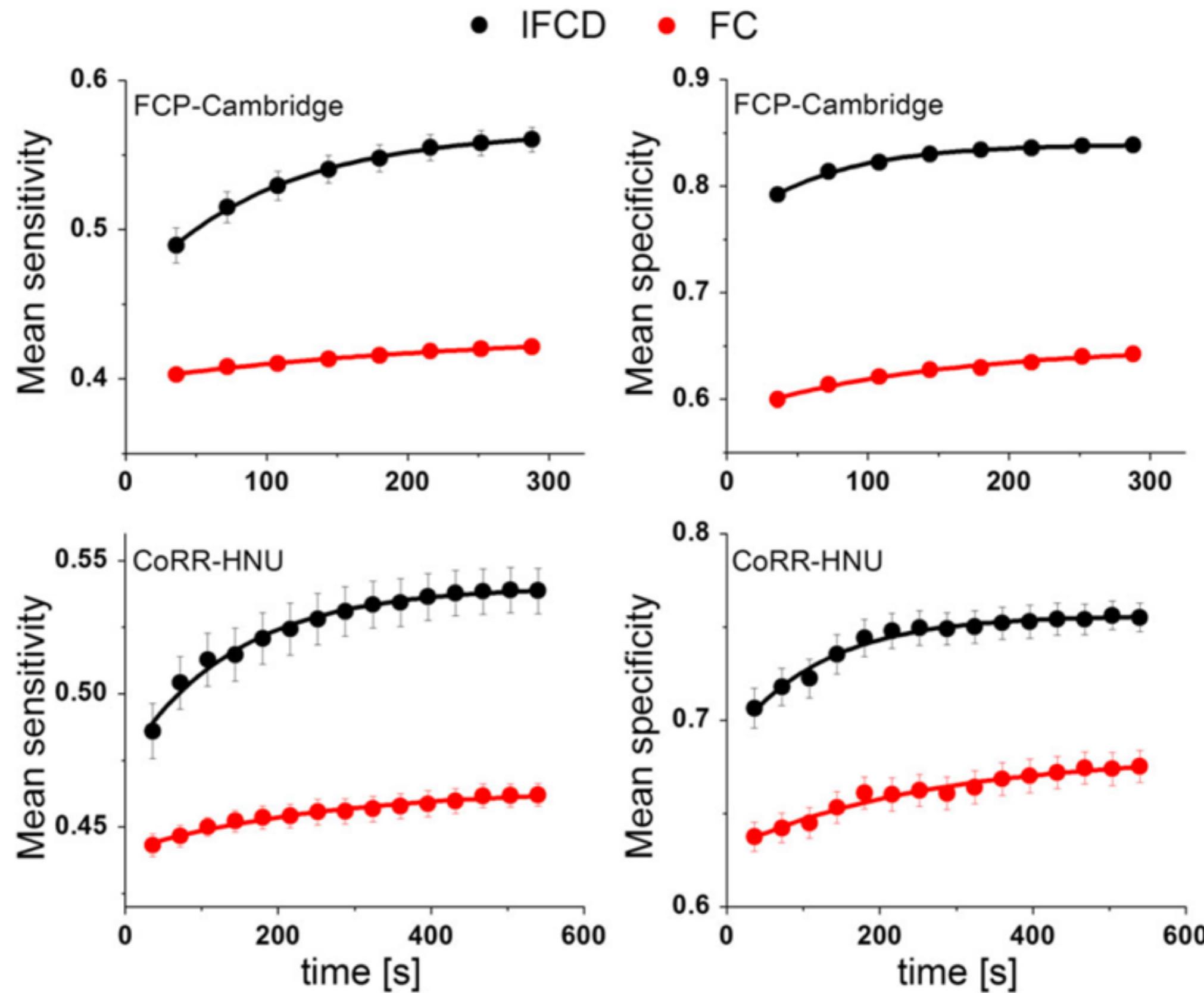
GM VOLUME



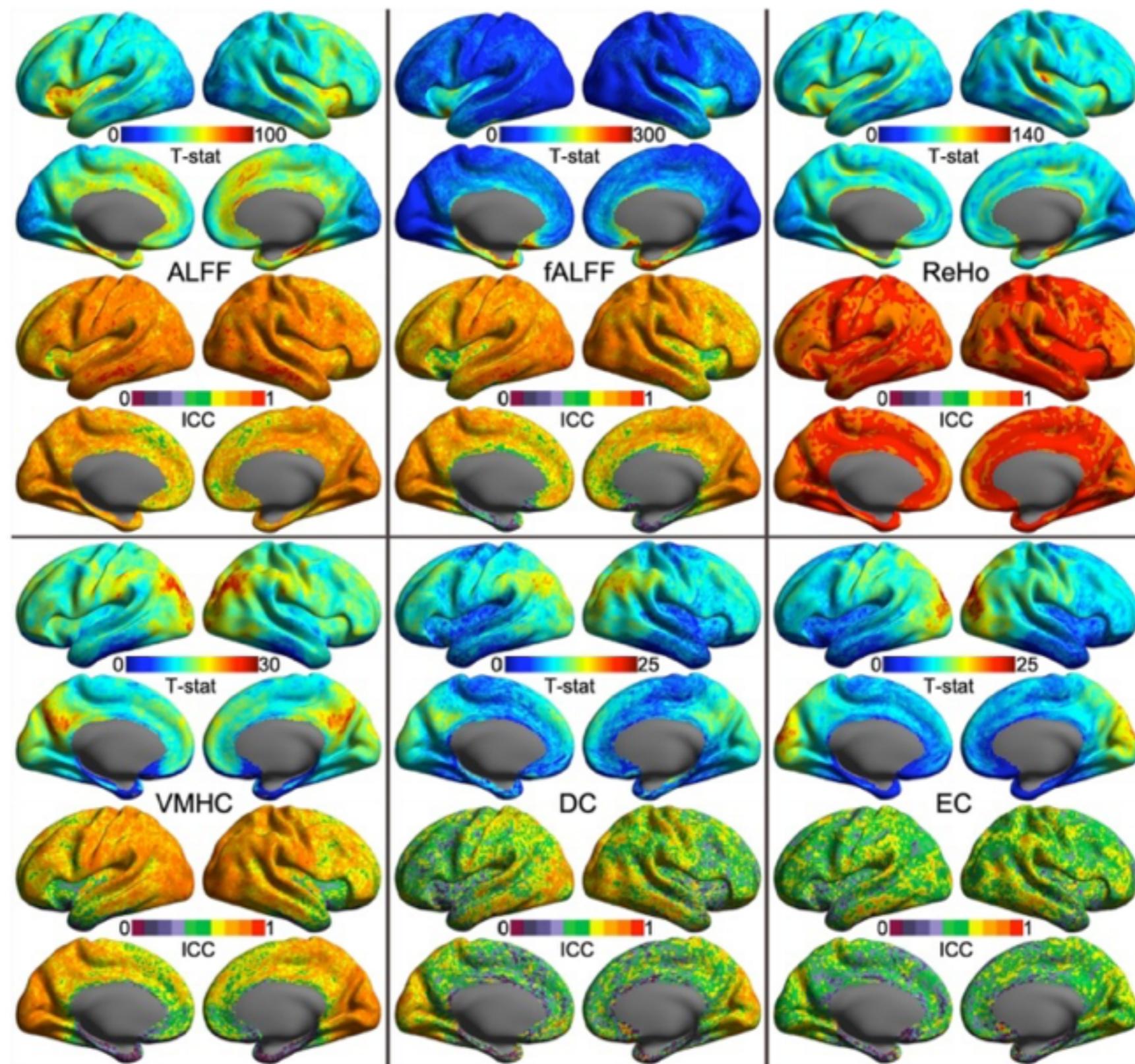
WM VOLUME



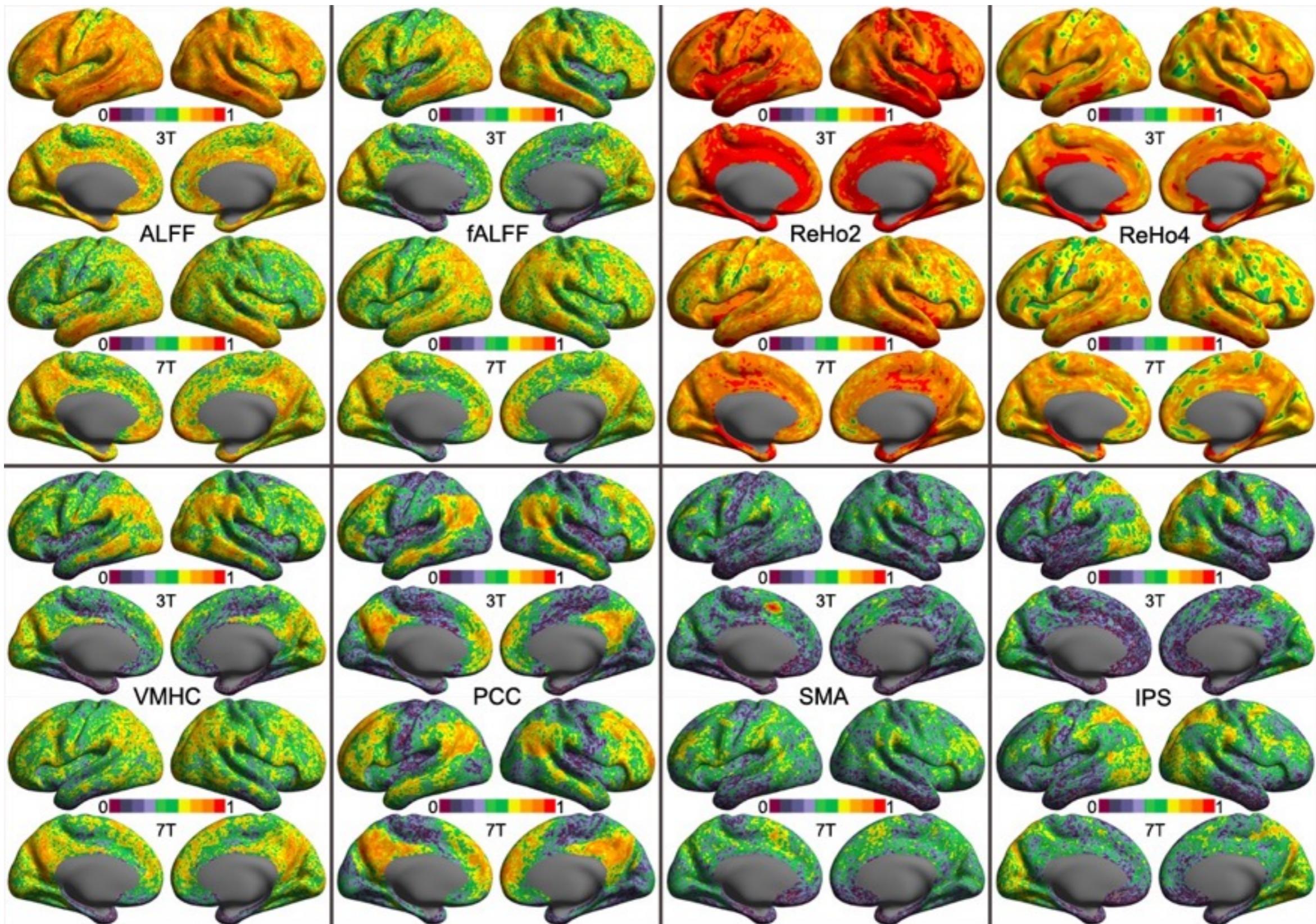
CoRR Data Discovery: Duration of rfMRI Scanning



HCP Test-Retest Reliability

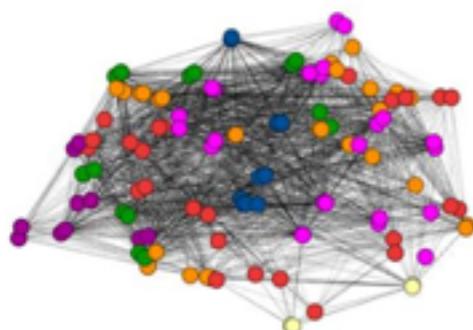


Replication of HCP Test-Retest Reliability



In Preparation

You Can Contribute: Use Open Data Resources



Research Topic

Reliability and Reproducibility in Functional Connectomics

About this Research Topic

Functional connectomics enables researchers to monitor interactions among thousands of units within the whole brain simultaneously by using various *vivo* imaging technologies. For example, resting-state functional magnetic resonance imaging (rfMRI) can image low-frequency fluctuations in the spontaneous brain activities, representing a popular tool for macro-scale functional connectomics to characterize inter-individual differences in normal brain function, mind-brain associations, and the various disorders. This suggests reliability and reproducibility for commonly used rfMRI-derived measures of the human brain functional connectomics. Unfortunately, lacking a data platform for researchers to rigorously explore the reliability and reproducibility of the functional connectome indices has been a bottleneck of further development of clinically oriented imaging markers in the field. With recent efforts on data sharing, such as Consortium for Reliability and Reproducibility (CoRR: <http://www.nature.com/sdata/collections/mri-reproducibility>), Human Connectome Project (HCP: <http://www.humanconnectome.org>) and OpenFMRI (<https://openfmri.org>), the data platform is increasingly available for the field to refine and evaluate reliability and reproducibility of novel methods as well as those that have gained widespread usage without sufficient consideration of reliability.

To promote the many possible uses of these data repositories, we call the field to: (1) establish test-retest reliability and reproducibility for commonly used MR-based connectome metrics, (2) determine the range of variation in the reliability and reproducibility of these metrics across imaging sites and retest study designs, (3) develop novel metrics with respect to improved reliability and reproducibility. This Frontiers Research Topic aims at bringing together contributions from researchers in brain imaging, neuroscience, computer sciences, applied mathematics, psychology and related fields from an interdisciplinary perspective.

Topic Editors

**Xi-Nian Zuo**

Chinese Academy
of Sciences (CAS)
Beijing, China



27,604 views 95 publications

**Bharat B Biswal**

UMDNJ
Newark, USA



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**Russell A Poldrack**

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Submission Deadlines

31 October 2016 Abstract

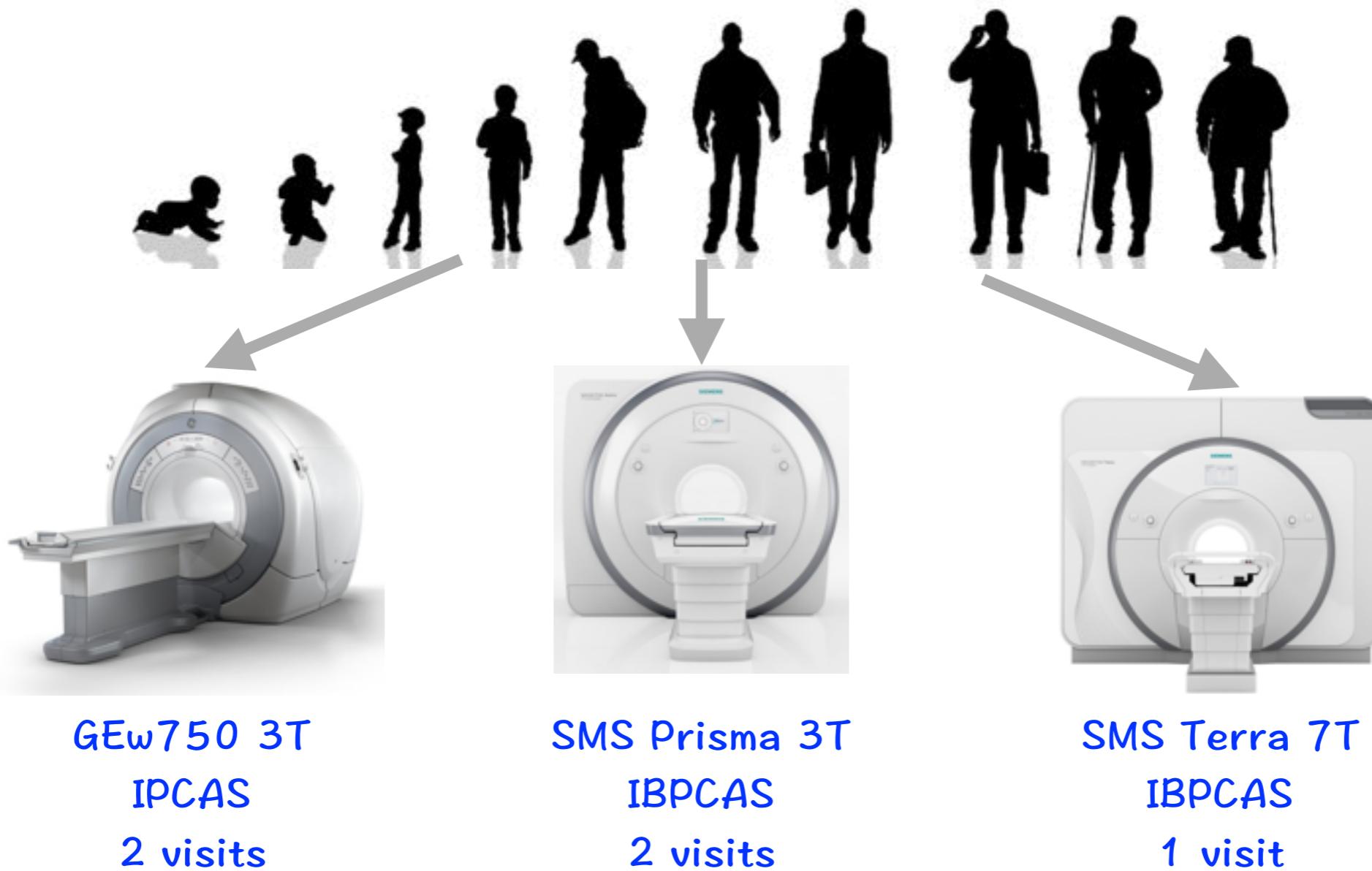
31 December 2016 Manuscript

Frontiers in
Neuroscience
Brain Imaging Methods

Frontiers in
Neurology
Brain Imaging Methods



Future: A Big Single-Site CoRR Data Sharing



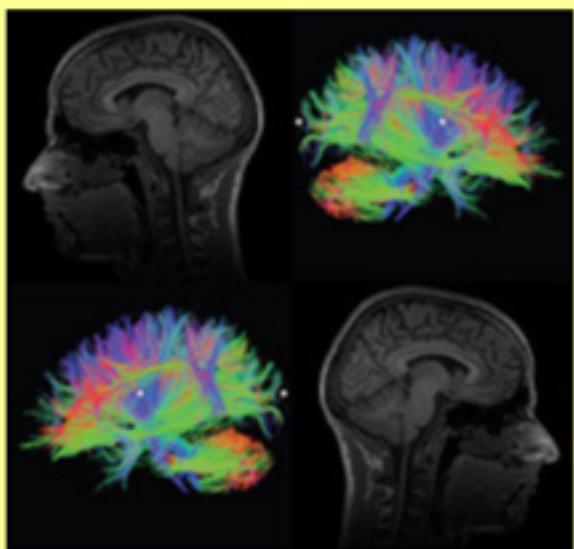
Total 6,000 Visits, 1200 People (6-85 yrs)

Total 5 ReTests per Person

To Appear in Trends in Cognitive Sciences

Thanks to All CoRR Contributors and Funding Agencies

Xi-Nian Zuo^{1,2,*}, Jeffrey S. Anderson³, Pierre Bellec⁴, Rasmus M. Birn⁵, Bharat B. Biswal⁶, Janusch Blautzik⁷, John C.S. Breitner⁸, Randy L. Buckner⁹, Vince D. Calhoun¹⁰, F. Xavier Castellanos^{11,12}, Antao Chen², Bing Chen¹³, Jiangtao Chen², Xu Chen², Stanley J. Colcombe¹¹, William Courtney¹⁰, R. Cameron Craddock^{11,14}, Adriana Di Martino¹², Hao-Ming Dong^{1,15}, Xiaolan Fu^{1,16}, Qiyong Gong¹⁷, Krzysztof J. Gorgolewski¹⁸, Ying Han¹⁹, Ye He^{1,15}, Yong He²⁰, Erica Ho^{11,14}, Avram Holmes²¹, Xiao-Hui Hou^{1,15}, Jeremy Huckins²², Tianzi Jiang²³, Yi Jiang¹, William Kelley²², Clare Kelly¹², Margaret King¹⁰, Stephen M. LaConte²⁴, Janet E. Lainhart⁵, Xu Lei², Hui-Jie Li¹, Kaiming Li¹⁷, Kuncheng Li²⁵, Qixiang Lin²⁰, Dongqiang Liu¹³, Jia Liu²⁰, Xun Liu¹, Yijun Liu², Guangming Lu²⁶, Jie Lu²⁵, Beatriz Luna²⁷, Jing Luo²⁸, Daniel Lurie^{11,14}, Ying Mao²⁹, Daniel S. Margulies¹⁸, Andrew R. Mayer¹⁰, Thomas Meindl⁷, Mary E. Meyerand³⁰, Weizhi Nan^{1,15}, Jared A. Nielsen³, David O'Connor^{11,14}, David Paulsen²⁷, Vivek Prabhakaran³¹, Zhigang Qi²⁵, Jiang Qiu², Chunhong Shao³², Zarrar Shehzad^{11,14}, Weijun Tang³³, Arno Villringer³⁴, Huiling Wang³⁵, Kai Wang^{1,15}, Dongtao Wei², Gao-Xia Wei¹, Xu-Chu Weng¹³, Xuehai Wu²⁹, Ting Xu^{1,11,14}, Ning Yang^{1,15}, Zhi Yang¹, Yu-Feng Zang¹³, Lei Zhang^{1,15}, Qinglin Zhang², Zhe Zhang^{1,15}, Zhiqiang Zhang²⁶, Ke Zhao¹, Zonglei Zhen²⁰, Yuan Zhou¹, Xing-Ting Zhu^{1,15} & Michael P. Milham^{11,14}



Human Brain MRI Reproducibility

A series of Data Descriptors describing human brain scans, which can be used to assess the reproducibility of brain imaging techniques and to develop new methods based on these data-types. Central to this collection are studies from the Consortium on Reliability and Reproducibility (CoRR).

人脑连接组神经影像研讨班 暨脑成像数据分析与论文撰写特训营

2016.12.15 - 2016.12.24

<http://zuolab.psych.ac.cn>

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