

Resource Summary Report

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ANTS - Advanced Normalization Tools

RRID:SCR_004757

Type: Tool

Proper Citation

ANTS - Advanced Normalization Tools (RRID:SCR_004757)

Resource Information

URL: <http://www.picsl.upenn.edu/ANTS/>

Proper Citation: ANTS - Advanced Normalization Tools (RRID:SCR_004757)

Description: THIS RESOURCE IS NO LONGER IN SERVICE. Documented on January 11, 2023. Software package designed to enable researchers with advanced tools for brain and image mapping. Many of the ANTS registration tools are diffeomorphic*, but deformation (elastic and BSpline) transformations are available. Unique components of ANTS include multivariate similarity metrics, landmark guidance, the ability to use label images to guide the mapping and both greedy and space-time optimal implementations of diffeomorphisms. The symmetric normalization (SyN) strategy is a part of the ANTS toolkit as is directly manipulated free form deformation (DMFFD). *Diffeomorphism: a differentiable map with differentiable inverse. In general, these maps are generated by integrating a time-dependent velocity field. ANTS Applications: * Gray matter morphometry based on the jacobian and/or cortical thickness. * Group and single-subject optimal templates. * Multivariate DT + T1 brain templates and group studies. * Longitudinal brain mapping -- special similarity metric options. * Neonatal and pediatric brain segmentation. * Pediatric brain mapping. * T1 brain mapping guided by tractography and connectivity. * Diffusion tensor registration based on scalar or connectivity data. * Brain mapping in the presence of lesions. * Lung and pulmonary tree registration. * User-guided hippocampus labeling, also of sub-fields. * Group studies and statistical analysis of cortical thickness, white matter volume, diffusion tensor-derived metrics such as fractional anisotropy and mean diffusion.

Abbreviations: ANTS

Synonyms: Advanced Normalization Tools

Resource Type: software application, registration software, data processing software, segmentation software, image analysis software, software resource

Defining Citation: [PMID:20851191](#), [PMID:33907199](#)

Keywords: algorithm, atlas application, morphology, segmentation, image registration, temporal transformation, child, pediatric, normalization

Funding: NIBIB R01 EB006266

Availability: THIS RESOURCE IS NO LONGER IN SERVICE

Resource Name: ANTS - Advanced Normalization ToolS

Resource ID: SCR_004757

Alternate IDs: nlx_75959

Alternate URLs: <http://www.nitrc.org/projects/ants>, <https://sources.debian.org/src/ants/>

Record Creation Time: 20220129T080226+0000

Record Last Update: 20250519T203334+0000

Ratings and Alerts

No rating or validation information has been found for ANTS - Advanced Normalization ToolS.

No alerts have been found for ANTS - Advanced Normalization ToolS.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We found 391 mentions in open access literature.

Listed below are recent publications. The full list is available at [FDI Lab - SciCrunch.org](#).

Heukamp NJ, et al. (2025) Beyond the chronic pain stage: default mode network perturbation depends on years lived with back pain. Pain, 166(1), 160.

- Isherwood S, et al. (2025) Multi-study fMRI outlooks on subcortical BOLD responses in the stop-signal paradigm. *eLife*, 12.
- Tashjian SM, et al. (2025) Subregions in the ventromedial prefrontal cortex integrate threat and protective information to meta-represent safety. *PLoS biology*, 23(1), e3002986.
- Singletary NM, et al. (2024) The parieto-occipital cortex is a candidate neural substrate for the human ability to approximate Bayesian inference. *Communications biology*, 7(1), 165.
- Atapour N, et al. (2024) Distribution of calbindin-positive neurons across areas and layers of the marmoset cerebral cortex. *PLoS computational biology*, 20(9), e1012428.
- Huang Q, et al. (2024) Replay-triggered brain-wide activation in humans. *Nature communications*, 15(1), 7185.
- Triana AM, et al. (2024) Longitudinal single-subject neuroimaging study reveals effects of daily environmental, physiological, and lifestyle factors on functional brain connectivity. *PLoS biology*, 22(10), e3002797.
- Zylberberg A, et al. (2024) Value construction through sequential sampling explains serial dependencies in decision making. *eLife*, 13.
- Zylberberg A, et al. (2024) Value construction through sequential sampling explains serial dependencies in decision making. *bioRxiv : the preprint server for biology*.
- Fischbach AK, et al. (2024) Seven Tesla Evidence for Columnar and Rostral-Caudal Organization of the Human Periaqueductal Gray Response in the Absence of Threat: A Working Memory Study. *The Journal of neuroscience : the official journal of the Society for Neuroscience*, 44(26).
- Bathelt J, et al. (2024) Relationship Between Resting State Functional Connectivity and Reading-Related Behavioural Measures in 69 Adults. *Neurobiology of language (Cambridge, Mass.)*, 5(2), 589.
- Ottoy J, et al. (2024) Tau follows principal axes of functional and structural brain organization in Alzheimer's disease. *Nature communications*, 15(1), 5031.
- Nick Q, et al. (2024) Reconfigurations of cortical manifold structure during reward-based motor learning. *eLife*, 12.
- Huang S, et al. (2024) Counterfactual thinking induces different neural patterns of memory modification in anxious individuals. *Scientific reports*, 14(1), 10630.
- Jimenez CA, et al. (2024) The dorsomedial prefrontal cortex prioritizes social learning during rest. *Proceedings of the National Academy of Sciences of the United States of America*, 121(12), e2309232121.
- Graves AJ, et al. (2024) Accelerated epigenetic age is associated with whole-brain functional

connectivity and impaired cognitive performance in older adults. Scientific reports, 14(1), 9646.

Tolonen T, et al. (2024) Working memory related functional connectivity in adult ADHD and its amenability to training: A randomized controlled trial. NeuroImage. Clinical, 44, 103696.

Areshenkoff CN, et al. (2024) Distinct patterns of connectivity with the motor cortex reflect different components of sensorimotor learning. PLoS biology, 22(12), e3002934.

Trang H, et al. (2024) A quantitative multi-parameter mapping protocol standardized for clinical research in multiple sclerosis. Scientific reports, 14(1), 30481.

Miao Z, et al. (2024) COMMON AND DISTINCT NEURAL CORRELATES OF SOCIAL INTERACTION PERCEPTION AND THEORY OF MIND. bioRxiv : the preprint server for biology.