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: 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, ANTsX

Synonyms: Advanced Normalization Tools

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

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/, https://gist.github.com/ntustison/12a656a5fc2f6f9c4494c88dc09c5621

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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 525 mentions in open access literature.

Listed below are recent publications. The full list is available at T1D .

Hvass CR, et al. (2026) Estimation of metabolic water production in human and rat brain and spinal cord. Fluids and barriers of the CNS, 23(1), 26.

Dennison JB, et al. (2026) Neurometabolic Response to Apneic Stimuli Tracks Global Grey Matter Volume Deficits in Patients With Obstructive Sleep Apnea. Journal of sleep research, 35(3), e70250.

Yi S, et al. (2026) Computational and neural mechanisms underlying the influence of action affordances on value learning. Nature communications, 17(1), 1096.

Harikumar A, et al. (2026) Examining comorbid and transdiagnostic depression clinical outcomes across anxiety, autism, attention deficit hyperactivity disorder (ADHD), bipolar disorder, depression, and schizotypal personality groups: a novel NeuroMark SPECT approach. medRxiv : the preprint server for health sciences.

Miao Z, et al. (2026) Common and distinct neural correlates of social interaction processing and theory of mind in narratives. Nature communications, 17(1).

Sugawara M, et al. (2026) A densely sampled fMRI dataset for investigating food valuation. Scientific data, 13(1).

Rezaei A, et al. (2026) The retrieval of previously learned motor memories is facilitated by the reinstatement of default mode network manifold structures. PLoS biology, 24(3), e3003684.

Wang M, et al. (2026) Global White Matter Damage in Focal Brainstem Injury Patients With Disorders of Consciousness: A Diffusion Tensor Tractography Study. European journal of neurology, 33(1), e70476.

Crawford JL, et al. (2026) Dissociable Mechanisms Underlie Differences Between Memory and Metamemory in Older Adults: The Differentiating Role of Anxiety and Depression Symptoms. Hippocampus, 36(3), e70100.

Roussel P, et al. (2026) In vivo autofluorescence lifetime imaging of spatial metabolic heterogeneities and learning-induced changes in the Drosophila mushroom body. eLife, 14.

Adriano A, et al. (2026) Echoes of time: Organization of episodic autobiographical memories in the brain according to their remoteness. NeuroImage, 331, 121857.

Stevenson N, et al. (2026) Building bridges between brain and behavior: An open-source toolbox for joint modeling with fMRI. Imaging neuroscience (Cambridge, Mass.), 4.

Quattrocchi CC, et al. (2026) Quadrato Motor Training in Parkinson's Disease: Resting-State fMRI Changes and Exploratory Whole-Brain Radiomics. Bioengineering (Basel, Switzerland), 13(5).

Blazey T, et al. (2026) Task-evoked deactivations: dissociation between BOLD fMRI and FDG. bioRxiv : the preprint server for biology.

Jacob J, et al. (2026) Behavioral and neurophysiological changes associated with a single session of bimanual task practice after stroke. Clinical neurophysiology practice, 11, 393.

Qu S, et al. (2026) Advancing whole-brain BOLD functional MRI in humans at 10.5 T with motion-robust 3D echo-planar imaging, parallel transmission, and high-density radiofrequency receive coils. Magnetic resonance in medicine, 95(2), 1068.

Hüppi RM, et al. (2026) Predicting Continuous Cognitive Decline: The Generalizability of a Multimodal Machine Learning Approach Including Structural MRI and Non-Brain Data. medRxiv : the preprint server for health sciences.

David I, et al. (2026) Distance- and hierarchy-dependent functional dysconnectivity in schizophrenia and its association with cortical microstructure. NeuroImage. Clinical, 49, 103958.

Centanino V, et al. (2026) Neuronal populations across the cortex underlie discrete, categorical, and subjective representations of visual durations. PLoS biology, 24(3),

e3003704.

Huang J, et al. (2026) Binding items to contexts through conjunctive neural representations with the method of loci. Nature communications, 17(1).