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/

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

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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Record Last Update: 20260728T043207+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 472 mentions in open access literature.

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

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.

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.

West JT, et al. (2026) Exploring the neural underpinnings of semantic and perceptual false memory formation. Neuropsychologia, 221, 109332.

Willems AL, et al. (2025) Omissions of threat trigger subjective relief and prediction error-like signaling in the human reward and salience systems. eLife, 12.

Hao Y, et al. (2025) A unique neural and behavioral profile of social anxiety in autism. Research square.

David I, et al. (2025) Distance- and Hierarchy-Dependent Functional Dysconnectivity in Schizophrenia and Its Association with Cortical Microstructure. medRxiv : the preprint server for health sciences.

Rezaei A, et al. (2025) Transfer of motor learning is associated with patterns of activity in the default mode network. PLoS biology, 23(8), e3003268.

Reddan MC, et al. (2025) Neural signatures of emotional intent and inference align during social consensus. Nature communications, 16(1), 6156.

Bas LM, et al. (2025) A neurocomputational account of the link between social perception and social action. eLife, 12.

Sulpizio V, et al. (2025) Unveiling the neural network involved in mentally projecting the self through episodic autobiographical memories. Scientific reports, 15(1), 12781.

Liu C, et al. (2025) Age differences in electrocortical dynamics during uneven terrain walking. bioRxiv : the preprint server for biology.

Mirjalili S, et al. (2025) Hippocampal transformations occur along dimensions of memory interference. bioRxiv : the preprint server for biology.

Malpetti M, et al. (2025) Blood inflammation relates to neuroinflammation and survival in frontotemporal lobar degeneration. Brain : a journal of neurology, 148(2), 493.

Kimbler A, et al. (2025) Advanced diffusion imaging in grey matter reflects individual differences in cognitive ability in older adults. bioRxiv : the preprint server for biology.

Warren SL, et al. (2025) Towards Clinical Diagnoses: Classifying Alzheimer's Disease Using Single fMRI, Small Datasets, and Transfer Learning. Brain and behavior, 15(3), e70427.

Bellmunt-Gil A, et al. (2025) Striatal cue-reactivity and neurotransmitter function in gambling disorder. Journal of behavioral addictions, 14(2), 997.

Rastelli C, et al. (2025) Neural dynamics of semantic control underlying generative storytelling. Communications biology, 8(1), 513.

Botvinik-Nezer R, et al. (2025) Expectation generation and its effect on subsequent pain and visual perception. PLoS computational biology, 21(5), e1013053.

Ding W, et al. (2025) Model-based and model-free valuation signals in the human brain vary markedly in their relationship to individual differences in behavioral control. bioRxiv : the preprint server for biology.

Mattioni S, et al. (2025) Impact of a transient neonatal visual deprivation on the development of the ventral occipito-temporal cortex in humans. Nature communications, 16(1), 9828.