Resource Summary Report

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PyMVPA

RRID:SCR_006099
Type: Tool

Proper Citation

PyMVPA (RRID:SCR_006099)

Resource Information

URL: http://www.pymvpa.org

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Description: A Python package intended to ease statistical learning analyses of large datasets. It offers an extensible framework with a high-level interface to a broad range of algorithms for classification, regression, feature selection, data import and export. While it is not limited to the neuroimaging domain, it is eminently suited for such datasets. PyMVPA is truly free software (in every respect) and additionally requires nothing but free-software to run. Decoding patterns of neural activity onto cognitive states is one of the central goals of functional brain imaging. Standard univariate fMRI analysis methods, which correlate cognitive and perceptual function with the blood oxygenation-level dependent (BOLD) signal, have proven successful in identifying anatomical regions based on signal increases during cognitive and perceptual tasks. Recently, researchers have begun to explore new multivariate techniques that have proven to be more flexible, more reliable, and more sensitive than standard univariate analysis. Drawing on the field of statistical learning theory, these new classifier-based analysis techniques possess explanatory power that could provide new insights into the functional properties of the brain. However, unlike the wealth of software packages for univariate analyses, there are few packages that facilitate multivariate pattern classification analyses of fMRI data. This Python-based, cross-platform, open-source software toolbox software toolbox for the application of classifier-based analysis techniques to fMRI datasets makes use of Python's ability to access libraries written in a large variety of programming languages and computing environments to interface with the wealth of existing machine learning packages.

Abbreviations: PyMVPA

Synonyms: Python MVPA, Multivariate Pattern Analysis in Python, PyMVPA - Multivariate Pattern Analysis in Python

Resource Type: software application, software resource, software toolkit

Defining Citation: PMID:19184561, PMID:19212459, PMID:20582270

Keywords: python, machine learning, fmri, eeg, neuroimaging, image analysis, scripting, multivariate pattern analysis, brain, meg, extracellular recording, algorithm, reusable library, analyze, c, console (text based), eeg, meg, electrocorticography, frequency domain, independent component analysis, linear, modeling, magnetic resonance, multivariate analysis, nifti, nonlinear, os independent, pet, spect, principal component analysis, python, regression, spatial transformation, statistical operation, temporal transformation, workflow

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Availability: MIT License

Resource Name: PyMVPA

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Alternate IDs: nlx_151596

Alternate URLs: http://www.nitrc.org/projects/pymvpa

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Ratings and Alerts

No rating or validation information has been found for PyMVPA.

No alerts have been found for PyMVPA.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 127 mentions in open access literature.

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

Li SPD, et al. (2024) A scene with an invisible wall - navigational experience shapes visual scene representation. bioRxiv : the preprint server for biology.

Sievers B, et al. (2024) Consensus-building conversation leads to neural alignment. Nature communications, 15(1), 3936.

Sakaki M, et al. (2024) Motivated with joy or anxiety: Does approach-avoidance goal framing elicit differential reward-network activation in the brain? Cognitive, affective & behavioral neuroscience, 24(3), 469.

Farahani FV, et al. (2024) Effects of connectivity hyperalignment (CHA) on estimated brain network properties: from coarse-scale to fine-scale. bioRxiv : the preprint server for biology.

Hauptman M, et al. (2023) Neural specialization for 'visual' concepts emerges in the absence of vision. bioRxiv : the preprint server for biology.

Wang P, et al. (2023) Distributed attribute representation in the superior parietal lobe during probabilistic decision-making. Human brain mapping, 44(17), 5693.

Andreella A, et al. (2023) Enhanced hyperalignment via spatial prior information. Human brain mapping, 44(4), 1725.

Kryklywy JH, et al. (2023) Dissociating representations of affect and motion in visual cortices. Cognitive, affective & behavioral neuroscience, 23(5), 1322.

Santavirta S, et al. (2023) Functional organization of social perception networks in the human brain. NeuroImage, 272, 120025.

Wang A, et al. (2023) Distinct patterns of neural response to faces from different races in humans and deep networks. Social cognitive and affective neuroscience, 18(1).

Kryklywy JH, et al. (2023) Decomposing Neural Representational Patterns of Discriminatory and Hedonic Information during Somatosensory Stimulation. eNeuro, 10(1).

Burleigh L, et al. (2023) Fear in the mind's eye: the neural correlates of differential fear acquisition to imagined conditioned stimuli. Social cognitive and affective neuroscience, 18(1).

Notter MP, et al. (2023) fMRIflows: A Consortium of Fully Automatic Univariate and Multivariate fMRI Processing Pipelines. Brain topography, 36(2), 172.

Kahn AE, et al. (2023) Network structure influences the strength of learned neural representations. bioRxiv : the preprint server for biology.

Leipold S, et al. (2023) Neural decoding of emotional prosody in voice-sensitive auditory cortex predicts social communication abilities in children. Cerebral cortex (New York, N.Y. : 1991), 33(3), 709.

Morningstar M, et al. (2022) Functional patterns of neural activation during vocal emotion recognition in youth with and without refractory epilepsy. NeuroImage. Clinical, 34, 102966.

Rogers D, et al. (2022) The emergence of view-symmetric neural responses to familiar and unfamiliar faces. Neuropsychologia, 172, 108275.

Cuaya LV, et al. (2022) Speech naturalness detection and language representation in the dog brain. NeuroImage, 248, 118811.

Greening SG, et al. (2022) Mental imagery can generate and regulate acquired differential fear conditioned reactivity. Scientific reports, 12(1), 997.

Geerligs L, et al. (2022) A partially nested cortical hierarchy of neural states underlies event segmentation in the human brain. eLife, 11.