

Accepted Manuscript

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PII: S1053-8119(18)30251-9

DOI: [10.1016/j.neuroimage.2018.03.040](https://doi.org/10.1016/j.neuroimage.2018.03.040)

Reference: YNIMG 14809

To appear in: *NeuroImage*

Received Date: 21 January 2018

Revised Date: 14 March 2018

Accepted Date: 18 March 2018

Please cite this article as: Yu-Feng Liu, L., Liu, Y., Zhu, H., for the Alzheimer's Disease Neuroimaging Initiative, SMAC: Spatial multi-category angle-based classifier for high-dimensional neuroimaging data, *NeuroImage* (2018), doi: 10.1016/j.neuroimage.2018.03.040.

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SMAC: Spatial Multi-category Angle-based Classifier for High-dimensional Neuroimaging Data ¹

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Abstract

With the development of advanced imaging techniques, scientists are interested in identifying imaging biomarkers that are related to different subtypes or transitional stages of various cancers, neuropsychiatric diseases, and neurodegenerative diseases, among many others. In this paper, we propose a novel spatial multi-category angle-based classifier (SMAC) for the efficient identification of such imaging biomarkers. The proposed SMAC not only utilizes the spatial structure of high-dimensional imaging data but also handles both binary and multi-category classification problems. We introduce an efficient algorithm based on an alternative direction method of multipliers to solve the large-scale optimization problem for SMAC. Both our simulation

¹This work was partially supported by NIH grants MH086633, MH092335, GM126550 and CA142538, NSF grants SES-1357666, DMS-1407655, DMS-1407241 and IIS-1632951, and a grant from the Cancer Prevention Research Institute of Texas. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH. The readers are welcome to request reprints from Dr. Hongtu Zhu. Email: hzhu5@mdanderson.org; Phone: 346-8140191.

“Data used in preparation of this article were obtained from the Alzheimer's Disease Neuroimaging Initiative (ADNI) database (adni.loni.usc.edu). As such, the investigators within the ADNI contributed to the design and implementation of ADNI and/or provided data but did not participate in the data analysis or writing of this report. A complete listing of ADNI investigators can be found at [http : //adni.loni.usc.edu/wp - content/uploads/how_to_apply/ADNI_Acknowledgement_List.pdf](http://adni.loni.usc.edu/wp-content/uploads/how_to_apply/ADNI_Acknowledgement_List.pdf)”

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