# Junhao Wen

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My research interests include methodology and application of machine learning, neuroimaging and genetics in brain aging and disorders. Using machine learning, I aim to distill complex, high-dimensional medical data into succinct yet informative dimensional representations that can be translated for personalized medicine. Through my career, I have been a practitioner for open neuroscience.

## **EDUCATION**

2015-2019 PhD in Computer Science

Sorbonne University, Paris, France

2012-2015 Master in Electronic Engineering

Beihang University, Beijing, China

2008-2012 Bachelor in Electronic Engineering

Beihang University, Beijing, China

## RESEARCH SKILLS

**Programming languages** Python, R, Bash, Matlab

Software and frameworks Machine learning (Scikit-learn, TensorFlow, Pytorch), Neuroimaging (Nipype, FreeSurfer, FSL,

ANTs, SPM), Genomics (Plink, PRSice, GCTA, LDSC)

Scientific writing Microsoft Word, 上下X, Overleaf, Inkscape

**Development tools** PyCharm, RStudio, GitHub

Others HTML, CSS

### RESEARCH EXPERIENCE

### August 2019

August 2021

#### Postdoctoral fellow

CBICA lab, University of Pennsylvania, USA

- > Postdoctoral research working with Christos Davatzikos
- > Focus on dissecting heterogeneity of brain diseases and data-driven dimensionality reduction techniques

Neuroimaging | Machine learning

#### October 2015

June 2019

#### ARAMIS lab, Sorbonne University, INRIA, CNRS, INSERM, Paris, France

- > Four-year PhD training under the supervision of Olivier Colliot and Anne Bertrand
- > Software developer for Clinica
- > PhD dissertation: Structural and microstructural neuroimaging for diagnosis and tracking of neurodegenerative diseases

Neurodegenerative disease Neuroimaging Machine learning

#### July 2017

October 2017 | CI

#### Visiting scholar

CMIC lab, University College London (UCL), London, UK

- > Collaboration with **Daniel Alexander** and **Hui Zhang**
- > Collaboration on a NODDI paper: Neurite density is reduced in the presymptomatic phase of C9orf72 disease

FTLD Clinical study Neuroimaging

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- > Wen, J., Cynthia HY Fu, Duygu Tosun, Yogasudha Veturi, Zhijian Yang, Ahmed Abdulkadir, Elizabeth Mamourian et al., Characterizing Heterogeneity in Neuroimaging, Cognition, Clinical Symptomatology, and Genetics Among Patients With Late-Life Depression. 2022, JAMA Psychiatry, doi:10.1001/jamapsychiatry.2022.0020 Ink
- > Bertrand, A., Wen, J. (Co-first author), Rinaldi, D., Houot, M., Sayah, S., Camuzat, A., Fournier, C., Fontanella, S., Routier, A., Couratier, P. and Pasquier, F., Habert, M., Hannequin, D., Martinaud, O., Caroppo, P., Levy, R., Dubois, B., Brice, A., Durrleman, S. and Colliot, O., Le Ber., I. 2018. Early Cognitive, Structural, and Microstructural Changes in Presymptomatic C9orf72 Carriers Younger Than 40 Years. JAMA Neurology, 75(2), pp.236-245.
- > Wen, J., Thibeau-Sutre, E., Diaz-Melo, M., Samper-González, J., Routier, A., Bottani, S., Dormont, D., Durrleman, S., Burgos, N., Colliot, O. and Alzheimer's Disease Neuroimaging Initiative, 2020. Convolutional neural networks for classification of Alzheimer's disease: Overview and reproducible evaluation. Medical image analysis, 63, p.101694. Think
- > Yang, Z., Nasrallah, I.M., Shou, H., Wen, J. et al., A deep learning framework identifies dimensional representations of Alzheimer's Disease from brain structure. Nature Communication 12, 7065 (2021). https://doi.org/10.1038/s41467-021-26703-z Ink
- > Wen, J., Zhang, H., Alexander, D.C., Durrleman, S., Routier, A., Rinaldi, D., Houot, M., Couratier, P., Hannequin, D., Pasquier, F. and Zhang, J., Colliot, O., Le Ber., I. and Bertrand, A. 2018. Neurite Density is Reduced in the Presymptomatic Phase of C9orf72 Disease. J Neurol Neurosurg Psychiatry, pp.jnnp-2018. link
- > Wen, J., Varol, E., Sotiras, A., Yang, Z., Chand, G.B., Erus, G., Shou, H., Hwang, G. and Davatzikos, C., 2021. Multi-scale semi-supervised clustering of brain images: deriving disease subtypes. Medical image analysis, 63, p.101694. link
- > Wen, J., Samper-González, J., Bottani, S., Routier, A., Burgos, N., Jacquemont, T., Fontanella, S., Durrleman, S., Epelbaum, S., Bertrand, A. and Colliot, O., 2021. Reproducible evaluation of diffusion MRI features for automatic classification of patients with Alzheimer's disease. Neuroinformatics, 19(1), pp.57-78.
- > Chand, G. B., Singhal, P., Dwyer, D. B., Wen, J. et al., 2022. Two schizophrenia imaging signatures and their associations with cognition, psychopathology, and genetics in the general population. American Journal of Psychiatry, 2022, , In press
- > Lalousis, P., Schmaal, L., Wood, S., Reniers, R., Barnes, N., Chisholm, K., Griffiths, S., Stainton, A., Wen, J., Hwang, G., Davatzikos, C., Bertolino, A., Borgwardt, S., Brambilla, P., Kambeitz, J., Lencer, R., Pantelis, C., Ruhrmann, S., Salokangas, R., Schultze-Lutter, F., Schmidt, A., Meisenzahl, E., Koutsouleris, N., Dwyer, D., Upthegrov, R., Neurobiologically Based Stratification of Recent Onset Depression and Psychosis: Identification of Two Distinct Transdiagnostic Phenotypes. Biological Psychiatry, 2022, In press
- > Ansart, M., Epelbaum, S., Bassignana, G., Bône, A., Bottani, S., Cattai, T., Couronne, R., Faouzi, J., Koval, I., Louis, M. and Thibeau-Sutre, E., <u>Wen, J.</u>, 2020. Predicting the progression of mild cognitive impairment using machine learning: a systematic, quantitative and critical review. <u>Medical image analysis</u>, p.101848.
- > Samper-González, J., Burgos, N., Bottani, S., Fontanella, S., Lu, P., Marcoux, A., Routier, A., Guillon, J., Bacci, M., Wen, J. and Bertrand, A., Bertin, H., Habert, M., Durrleman, S., Evgeniou, T. and Colliot., O. 2018. Reproducible evaluation of classification methods in Alzheimer's disease: framework and application to MRI and PET data. Neuroimage, 2018.
- > Yue, L., Hu, D., Zhang, H., Wen, J., Wu, Y., Li, W., Sun, L., Li, X., Wang, J., Li, G. and Wang, T., 2021. Prediction of 7-year's conversion from subjective cognitive decline to mild cognitive impairment. Human brain mapping, 42(1), pp.192-203.
- > Marcoux, A., Burgos., Bertrand., Teichmann., Routier A., <u>Wen J.</u>, Samper-Gonzalez J., Bottani, S., Durrleman, S., Habert, M. and Colliot, O. 2018. An Automated Pipeline for the Analysis of PET Data on the Cortical Surface. Frontiers in Neuroinformatics, 2018.
- > Routier A, Burgos N, Díaz M, Bacci M, Bottani S, El-Rifai O, Fontanella S, Gori P, Guillon J, Guyot A, Hassanaly R, Jacquemont T, Lu P, Marcoux A, Moreau T, Samper-González J, Teichmann M, Thibeau-Sutre E, Vaillant G, Wen, J., Wild A, Habert M-O, Durrleman S and Colliot O (2021) Clinica: An Open-Source Software Platform for Reproducible Clinical Neuroscience Studies. Front. Neuroinform. 15:689675. doi: 10.3389/fninf.2021.689675

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- > Wen, J., Varol, E., Chand, G., Sotiras, A. and Davatzikos, C., 2020, October. MAGIC: Multi-scale Heterogeneity Analysis and Clustering for Brain Diseases. International Conference on Medical Image Computing and Computer-Assisted Intervention (pp. 678-687). Springer, Cham.
- > Yang, Z., <u>Wen, J.</u>, and Davatzikos, C., 2021. Surreal-GAN:Semi-Supervised Representation Learning via GAN for uncovering heterogeneous disease-related imaging patterns. <u>International Conference on Learning Representations</u>

#### 🗖 Book chapters

> Wen, J., Varol, E., Yang, Z., Hwang, G., Dwyer, D., Kazerooni, A., Lalousis, P., and Davatzikos, C., 2022, January. Subtyping brain diseases from imaging data. Machine Learning for Brain Disorders Springer. In press

#### A PAPERS IN PREPARATION

- > Wen, J. et al., Mega-analysis of brain structural covariance, genetics, and clinical phenotypes. In review in Nature Communications. Ink
- > Wen, J. et al., Al quantifies individualized risks of Alzheimer's disease. In preparation for Nature
- > Hwang, G., Wen, J. (Co-first author), et al., Three Imaging Endophenotypes Characterize Neuroanatomical Heterogeneity of Autism Spectrum Disorder. Submitted to Nature Medicine





- > Music
- > Extreme sports
- > Travel



#### Christos Davatzikos

Chinese

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#### Olivier Colliot

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