

**Junpeng Lao, PhD**

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Born 1986.09.05

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## Professional History

**2018.7 – present** Data Scientist at Google Zurich.

**2013.9 – 2018.7** Post-doc at University of Fribourg. I am supported by the Swiss National Science Foundation (n° 100014\_138627 and n° 100014\_156490/1)

**2012.9 – 2013.9** Research assistant at University of Fribourg. I was supported by National Center of Competence in Research (NCCR) Affective sciences financed by the Swiss National Science Foundation (n° 51NF40-104897).

## Education

**2009.10 – 2013.9** University of Glasgow, Ph.D in Cognitive Neuroscience, Thesis title: “Tracking the temporal dynamics of cultural perceptual diversity in visual information processing”. Advisor: Prof. Roberto Caldara and Prof. Lars Muckli.

**2005.9 – 2009.6** Sun Yat-Sen University, B. Sc. in Psychology. Thesis title: “Control deprivation and styles of thinking”. Advisor: Prof. Xinyue Zhou.

## Software and Algorithms

I contributed to various Open-Source Software regularly, more information could be found on Github: <https://github.com/junpenglao>

**PyMC3** (<https://github.com/pymc-devs/pymc3>) – a Python package for Bayesian statistical modelling and Probabilistic Machine Learning. It implemented advanced Markov chain Monte Carlo and variational inference algorithms. I am part of the core development team `pymc_devs`.

**iMap4** (<https://github.com/iBMLab/iMap4>) – a Matlab toolbox for statistical fixation mapping of eye movement data. It is a data-driven statistics toolbox implementing linear mixed model and non-parametric statistics based on permutation and bootstrap spatial clustering. It also has a full graphical user interface. iMap4 is one of the three finalists of the SMI Computing Competition in ECEM 2015.

**JAEFA** (<https://github.com/junpenglao/jaefa>) – Just Another Eye-movement Filtering Algorithm, a simple Matlab toolbox for eye movement event detection with a Convolution-based algorithm

## Preprints

Stacchi, L., Ramon, M., **Lao, J.**, & Caldara, R. (2018). Neural representations of faces are tuned to eye movements. *bioRxiv*, 402263. [doi: 10.1101/402263](https://doi.org/10.1101/402263)

**Lao, J.** (2016). Reproducible Research with End-to-end Machine Inference Using Deep Learning and Bayesian Statistics, *Journal of Brief Ideas*, [doi: 10.5281/zenodo.203086](https://doi.org/10.5281/zenodo.203086)

## Journal Articles

Han, C., Wang, H., Fasolt, V., Hahn, A., Holzleitner, I. J., **Lao, J.**, ... & Jones, B. (2018). No clear evidence for correlations between handgrip strength and sexually dimorphic acoustic properties of voices. *American Journal of Human Biology*, e23178. [doi: 10.1002/ajhb.23178](https://doi.org/10.1002/ajhb.23178)

Eulerich, M., Theis, J.C., **Lao, J.**, & Ramon, M. (2018). Do Fine Feathers Make a Fine Bird? The Influence of Attractiveness on Fraud-Risk Judgments by Internal Auditors. *International Journal of Auditing*, 1-13. [doi: 10.1111/ijau.12137](https://doi.org/10.1111/ijau.12137)

Richoz, A.-R., **Lao, J.**, Pascalis, O., & Caldara, R. (2018). Tracking the recognition of static and dynamic facial expressions of emotion across the life span. *Journal of Vision*, 18(9):5, 1-27. [doi: 10.1167/18.9.5](https://doi.org/10.1167/18.9.5)

Jones, B. C., Hahn, A. C., Fisher, C. I., Wang, H., Kandrik, M., **Lao, J.**, Han, C., ... & DeBruine, L. M. (2018). No compelling evidence that more physically attractive young adult women have higher estradiol or progesterone. *Psychoneuroendocrinology*, 98, 1-5. [doi: 10.1016/j.psyneuen.2018.07.026](https://doi.org/10.1016/j.psyneuen.2018.07.026)

Vizioli, L., Bratch, A.<sup>1</sup>, **Lao, J.**<sup>1</sup>, Ugurbil, K., Muckli, L., & Yacoub, E. (2018). Temporal multivariate pattern analysis (tmVPA): A single trial approach exploring the temporal dynamics of the BOLD signal. *Journal of Neuroscience Methods*, 308, 74-87. [doi: 10.1016/j.jneumeth.2018.06.029](https://doi.org/10.1016/j.jneumeth.2018.06.029)

<sup>1</sup>Equal contribution

Rodger, H., **Lao, J.**, & Caldara, R. (2018). Quantifying facial expression signal and intensity use during development. *Journal of Experimental Child Psychology*, 174, 41-59. [doi: 10.1016/j.jecp.2018.05.005](https://doi.org/10.1016/j.jecp.2018.05.005)

Ramon, M., Sokhn, N., **Lao, J.**, & Caldara, R. (2018). Decisional space determines saccadic reaction times in healthy observers and acquired prosopagnosia. *Cognitive Neuropsychology*, [doi: 10.1080/02643294.2018.1469482](https://doi.org/10.1080/02643294.2018.1469482)

Malaspina, M., Albonico, A., **Lao, J.**, Caldara, R., & Daini, R. (2018). Mapping self-face recognition strategies in congenital prosopagnosia. *Neuropsychology*, 32(2), 123-137. [doi: 10.1037/neu0000414](https://doi.org/10.1037/neu0000414)

- Lakens, D., Adolphi, F. G., ..., **Lao, J.**, ..., Zwaan, R. A. (2018). Justify Your Alpha. *Nature Human Behaviour*, 2, 168-171. [doi:10.1038/s41562-018-0311-x](https://doi.org/10.1038/s41562-018-0311-x)
- Turano<sup>1</sup>, M. T., **Lao<sup>1</sup>, J.**, Richoz, A-R., de Lissa, P., Degosciu, S. B., Viggiano, M. P., & Caldara, R. (2017). Fear boosts the early neural coding of faces. *Social cognitive and affective neuroscience*, 12(12), 1959-1971. [doi: 10.1093/scan/nsx110](https://doi.org/10.1093/scan/nsx110)
- <sup>1</sup>Joint first authors
- Stoll, C., Palluel-Germain, R., Caldara, R., **Lao, J.**, Dye, M. W. G., Aptel, F., & Pascalis, O. (2017). Face Recognition is Shaped by the Use of Sign Language. *Journal of Deaf Studies and Deaf Education*. [doi: 10.1093/deafed/enx034](https://doi.org/10.1093/deafed/enx034)
- Papinutto, M., **Lao, J.**, Ramon, M., Caldara, R., & Mielle, S. (2017). The Facespan—the perceptual span for face recognition. *Journal of Vision*, 17(5):16. [doi: 10.1167/17.5.16](https://doi.org/10.1167/17.5.16)
- Garcia-Burgos, D., **Lao, J.**, Munsch, S., & Caldara, R. (2017). Visual attention to food cues is differentially modulated by gustatory-hedonic and post-ingestive attributes. *Food Research International*, 97, 199-208. [doi: 10.1016/j.foodres.2017.04.011](https://doi.org/10.1016/j.foodres.2017.04.011)
- Lao, J.**, Mielle, S., Pernet, C., Sokhn, N., & Caldara, R. (2017). iMap4: An Open Source Toolbox for the Statistical Fixation Mapping of Eye Movement data with Linear Mixed Modeling. *Behavior Research Methods*, 49(2), 559-575. [doi: 10.3758/s13428-016-0737-x](https://doi.org/10.3758/s13428-016-0737-x)
- Ruffieux<sup>1</sup>, N., Ramon<sup>1</sup>, M., **Lao<sup>1</sup>, J.**, Colombo, F., Stacchi, L., Borruat, FX., Accolla, E., Annoni JM., & Caldara, R. (2016). Residual Perception of Biological Motion in Cortical Blindness. *Neuropsychologia*, 93, 301-311. [doi: 10.1016/j.neuropsychologia.2016.11.009](https://doi.org/10.1016/j.neuropsychologia.2016.11.009)
- <sup>1</sup>Joint first authors
- Geangu<sup>1</sup>, E., Ichikawa<sup>1</sup>, H., **Lao<sup>1</sup>, J.**, Kanazawa, S., Yamaguchi, M. K., & Caldara<sup>2</sup>, R., & Turati<sup>2</sup>, C. (2016). Culture shapes 7-month-olds perceptual strategies in discriminating facial expressions of emotion. *Current Biology*, 26, 663–664. [doi: 10.1016/j.cub.2016.05.072](https://doi.org/10.1016/j.cub.2016.05.072)
- <sup>1</sup>Joint first authors and <sup>2</sup>joint last authors
- Bovet, J., **Lao, J.**, Bartholomé, O., Caldara, R., & Raymond, M. (2016). Mapping female bodily features of attractiveness. *Scientific Reports*, 6, 18551. [doi: 10.1038/srep18551](https://doi.org/10.1038/srep18551)
- Mielle, S., **Lao, J.**, & Caldara, R. (2014). An appropriate use of iMap produces correct statistical results: a reply to McManus (2013)“iMAP and iMAP2 produce erroneous statistical maps of eye-movement differences”. *Perception*, 43, 451-457.
- Lao, J.**, Vizioli, L., & Caldara, R. (2013). Culture modulates the temporal dynamics of global/local processing. *Culture and Brain*, 1(2-4), 158-174.
- Romeo, M., Vizioli, L., Breukink, M., Aganloo, K., **Lao, J.**, Cotrufo, S., Caldara, R., & Morley, S. (2013). A Functional Magnetic Resonance Imaging Paradigm to Identify Distinct Cortical Areas of Facial Function: A Reliable Localizer. *Plastic and reconstructive surgery*, 131(4), 527e-533e.
- Mielle, S., Zhou, X., He, L., **Lao, J.**, & Caldara, R. (2012). When East meets West: gaze-contingent Blindspots abolish cultural diversity in eye movements for faces. *Journal of Eye Movement Research*, 5, 1-12.

Zhou, X., He, L., Yang, Q., **Lao, J.**, & Baumeister, R. F. (2012). Control deprivation and styles of thinking. *Journal of personality and social psychology*, 102(3), 460.

## Conference Presentations

2018.7.6 – 8, Lao, J. (2018). [All that likelihood with PyMC3](#). PyData Berlin.

2017.9.4 – 5, Lao, J., Stoll, C., Dye, M., Pascalis, O., & Caldara, R. (2017). Deafness Amplifies Visual Information Sampling during Face Recognition. 15<sup>th</sup> Biannual congress of the Swiss Psychological Society. (Lausanne, Switzerland, **oral presentation**)

2017.8.27 – 31 Lao, J., Stoll, C., Dye, M., Pascalis, O., & Caldara, R. (2017). Deafness Amplifies Visual Information Sampling during Face Recognition. 40<sup>th</sup> European Conference on Visual Perception. (Berlin, Germany)

2017.5.19 – 24 Lao, J., Stoll, C., Dye, M., Pascalis, O., & Caldara, R. (2017). Deafness Amplifies Visual Information Sampling during Face Recognition. *Journal of Vision*, 17(10): 24 (17<sup>th</sup> annual meeting of Vision Sciences Society, **oral presentation**)

2017.4.20 Lao, J. (2017). Statistical Inferences of Eye movement data using Bayesian smoothing. Bayes@Lund2017. (Lund, Sweden, **oral presentation**)

2016.5.13 – 18 Lao, J., Richoz, A-R., Stoll, C., Pascalis, O., Dye, M., & Caldara, R. (2016). Mapping the recognition of facial expression of emotions in deafness. *Journal of Vision*, 16(12): 1391 (16<sup>th</sup> annual meeting of Vision Sciences Society)

2015.9.8 – 9 Lao, J., Miellet, S., Pernet, C., Sokhn, N., & Caldara, R. (2015). iMap4: An Open Source Toolbox for the Statistical Fixation Mapping of Eye Movement data with Linear Mixed Modeling. 14<sup>th</sup> Biannual congress of the Swiss Psychological Society. (Geneva, Switzerland, **oral presentation**)

2015.8.16 – 21 Lao, J., Miellet, S., Pernet, C., Sokhn, N., & Caldara, R. (2015). iMap4: An Open Source Toolbox for the Statistical Fixation Mapping of Eye Movement data with Linear Mixed Modeling. 18<sup>th</sup> European Conference on Eye Movements. (Vienna, Austria, **oral presentation**)

2015.5.15 – 20 Lao, J., Miellet, S., Pernet, C., Sokhn, N., & Caldara, R. (2015). iMap4: An Open Source Toolbox for the Statistical Fixation Mapping of Eye Movement data with Linear Mixed Modeling. *Journal of Vision*, 15(12): 793 (15<sup>th</sup> annual meeting of Vision Sciences Society)

2015.1.24 Lao, J., & Caldara, R. (2015). Reverse correlating facial feature use in free-viewing EEG signals. Annual Meeting of Swiss Society for Neuroscience (Fribourg, Switzerland)

2015.1.11 – 15 Lao, J., & Caldara, R. (2015). Reverse correlating facial feature use in free-viewing EEG signals. Alpine Brain Imaging Meeting 2015. (Champéry, Switzerland)

2014.8.24 – 28 Lao, J., He, L., & Caldara, R. (2014). Microsaccades boost face identification as a function of culture. 37<sup>th</sup> European Conference on Visual Perception. (Belgrade, Serbia)

- 2014.5.16 – 21** Lao, J., Vizioli, L., Muckli, L., & Caldara, R. (2014). Decoding culture from the human primary visual cortex. *Journal of Vision*, 14(10):1093 (14<sup>th</sup> annual meeting of Vision Sciences Society)
- 2014.1.12 – 16** Lao, J., Vizioli, L., Muckli, L., & Caldara, R. (2014). Decoding Culture from the Human Primary Visual Cortex. Alpine Brain Imaging Meeting 2014. (Champéry, Switzerland)
- 2013.9.11 – 12** Lao, J., He, L., & Caldara, R. (2013). Microsaccades Boost Face Identification. 13<sup>th</sup> Biannual congress of the Swiss Psychological Society. (Basel, Switzerland, **oral presentation**)
- 2013.5.10 – 15** Lao, J., He, L., & Caldara, R. (2013). Microsaccades Boost Face Identification. *Journal of Vision*, 13 (9): 1344(13<sup>th</sup> annual meeting of Vision Sciences Society)
- 2012.1.8 – 12** Lao, J., Vizioli, L., Rodger, H., & Caldara, R. (2012). Neural Adaptation Reveals Early Cultural Tunings in Perceptual Sensitivity to Local/Global Shapes. Alpine Brain Imaging Meeting 2012. (Champéry, Switzerland)
- 2011.7.15 - 18** Lao, J., Vizioli, L., Miellel, S., & Caldara, R. (2011). Eyes like it, brain likes it: Tracking the neural tuning of cultural diversity in eye movements for faces. *i-Perception* 2(4) 356. (Asia-Pacific Conference on Vision, 2011, **oral presentation**)
- 2011.5.6 - 11** Lao, J., Miellel, S., Vizioli, L., Fusco, R., & Caldara, R. (2011). Eyes like it, brain likes it: Tracking the neural tuning of cultural diversity in eye movements for faces. *Journal of Vision*, 11(11): 628. (11<sup>th</sup> annual meeting of Vision Sciences Society)
- 2011.3.26** Lao, J., Vizioli, L., Miellel, S., & Caldara, R. (2011). Eyes like it, brain likes it: Tracking the neural tuning of cultural diversity in eye movements for faces. Annual Meeting of Swiss Society for Neuroscience (Basel, Switzerland)
- 2011.1.9 - 13** Lao, J., Vizioli, L., Miellel, S., & Caldara, R. (2011). Eyes like it, brain likes it: Tracking the neural tuning of cultural diversity in eye movements for faces. Alpine Brain Imaging Meeting 2011. (Champéry, Switzerland, **oral presentation**)
- 2010.5.7 - 12** Lao, J., Foreman, K., Zhou, X., Lages, M., Hillis, J., & Caldara, R. (2010). Social judgments from faces are universal. *Journal of Vision*, 10(7): 698. (10<sup>th</sup> annual meeting of Vision Sciences Society)

## Teaching

(Course)

Cognitive Neuroscience

Statistical Analysis with MATLAB

Psychology Experiment with MATLAB and Psychtoolbox-3

(Workshop)

## [Advance Bayesian Modelling with PyMC3](#)

Bayesian Cognitive Modelling

Bayesian Mixed-effect model in Python

Bayesian Deep Learning using PyMC3

Statistical Fixation Mapping of Eye Movement data with iMap

The Wonder of Gauss: GLM, GAM, and GP

## **Awards**

**2010.12** Guarantors of Brain Travel Grant supporting the attendance of the Alpine Brain Imaging Meeting in January 2011

**2010.5** Experimental Psychology Society Grindley Grant supporting the attendance of the Vision Science Society Annual Meeting in May 2010

**2009.9** UK/China PhD Scholarships for Excellence programme funded by China Scholarship Council and the Scottish Government