Kristopher Torp Jensen

University of Cambridge – Computational and Biological Learning Lab   ktj21@cam.ac.uk

Education

2019 - present **PhD Computational Neuroscience**
University of Cambridge
Supervisor: Dr Guillaume Hennequin
- Continual learning in biological motor circuits and for AI.
- Planning and decision making in biological and artificial agents.
- Development of Bayesian latent variable models for neural population recodings.

2018 - 2019 **MPhil Computational Biology**
University of Cambridge
Result: Distinction   (89.1/100; 1st of 19 students)

2015 - 2018 **BA Natural Sciences**
University of Cambridge
Result: First Class Honors   (82.7/100; 1st of 112 students)

Research

2022 - present **UC San Diego Department of Cognitive Science**
Supervisor: Dr Marcelo Mattar
- Studying planning & decision making with behaviour, neural recordings, and deep RL.

2019 - present **Harvard Center for Brain Science**
Supervisor: Professor Bence Ölveczky
- Analysis & modelling of the stability of neural dynamics associated with motor memories.

2018 - 2019 **Janelia Research Campus**
Supervisor: Professor Vivek Jayaraman
- Analysis & modelling of connectomic & RNAseq data from the fly head direction circuit.

2017 - 2018 **Cambridge Centre for Computational Chemistry**
Supervisor: Dr Alex Thom
- Development of a Hartree Fock-based method for modeling electron transfer reactions.

2016 - 2017 **Aarhus University Department of Biomedicine**
Supervisor: Dr Yonglun Luo
- Investigation of factors affecting the efficiency of CRISPR/Cas9 for genome editing.

Invited Talks

2022 **Cosyne workshop on motor-driven cognition**
Do-nut assume it's flat: Capturing the topology of neural representations with probabilistic models

2022 **ContinualAI**
Natural continual learning: Success is a journey, not (just) a destination

2021 **The Weizmann Institute of Science (Ziv lab)**
Long-term stability of neural activity in the motor system

2021 **Imperial College London (Gallego lab)**
Unsupervised learning for neural data analysis

2021 **MIT Brain and Cognitive Sciences tutorial**
Learning what we know and knowing what we learn: GP priors for neural data analysis

2021 **Harvard University (Ölveczky lab)**
Scalable Bayesian GPFA

2020 **Cambridge Engineering Division F Conference**
Manifold GPLVMs for discovering non-Euclidean latent structure in neural data

Teaching

2020 & 2022	University of Cambridge – Teaching Assistant, 3rd year computational neuroscience.
2021	Neuromatch Academy – Teaching Assistant, computational neuroscience.
2020 - 2021	University of Cambridge – Teaching Assistant, 3rd year mathematical biology.
2018 - 2020	University of Cambridge – Teaching Assistant, 3rd year theoretical chemistry.

Fellowships

2019 - present	Cambridge Gates Scholarship
2016 - 2019	Scholar of Magdalene College, Cambridge
2018	Janelia Undergraduate Scholar
2015	*British Chamber of Commerce in Denmark* Scholar

Prizes

2015 - 2018	GWHP Memorial Prize for best performance in undergraduate chemistry.
	Gill, Bundy & B.C. Saunders prizes for excellence in university examinations.
	BP Prizes for the best performance in practical chemistry and theoretical chemistry.
2014 & 2015	Silver medal – The International Chemistry Olympiad.

Programming

Python (PyTorch, Jax, TensorFlow), Julia (Zygote, Flux), R, Matlab.

Reviewing

Nature Neuroscience, Neuron, Nature Methods, NeurIPS workshops, Nature Communications.

Publications

2022   **Kristopher T. Jensen**, Naama Kadmon Harpaz, Steffen B. E. Wolff, Ashesh K. Dhawale, and Bence P. Ölveczky.
Long-term stability of single neuron activity in the motor system. *Nature Neuroscience.*

2022   Marine Schimel, Ta-Chu Kao, **Kristopher T. Jensen**, and Guillaume Hennequin.
iLQR-VAE : control-based learning of input-driven dynamics with applications to neural data.
The International Conference on Learning Representations (oral).

2021   **Kristopher T. Jensen***, Ta-Chu Kao*, Jasmine T. Stone, and Guillaume Hennequin.
Scalable Bayesian GPFA with automatic relevance determination and discrete noise models.
Advances in Neural Information Processing Systems.

2021   Ta-Chu Kao*, **Kristopher T. Jensen***, Alberto Bernacchia, and Guillaume Hennequin.
Natural continual learning: success is a journey, not (just) a destination.
Advances in Neural Information Processing Systems.

2020   **Kristopher T. Jensen**, Ta-Chu Kao, Marco Tripodi, and Guillaume Hennequin.
Manifold GPLVMs for discovering non-Euclidean latent structure in neural data.
Advances in Neural Information Processing Systems.

2020   Daniel B. Turner-Evans, **Kristopher T. Jensen***, Saba Ali*, Tyler Paterson*, Arlo Sheridan*, Robert P. Ray, Tanya Wolff, Gerald M. Rubin, Davi D. Bock, and Vivek Jayaraman.
The neuroanatomical ultrastructure and function of a biological ring attractor. *Neuron.*

2018   **Kristopher T. Jensen**, Raz L. Benson, Salvatore Cardamone, and Alex J. W. Thom.
Modeling electron transfers using quasidiabatic Hartree-Fock states.
Journal of Chemical Theory and Computation.

2017   **Kristopher T. Jensen**, Lasse Fløe, Trine S. Petersen, Jinrong Huang, Fengping Xu, Lars Bolund, Yonglun Luo, and Lin Lin.
Chromatin accessibility and guide sequence secondary structure affect CRISPR-Cas9 gene editing efficiency. *FEBS Letters.*

Conferences

2022   **Reinforcement learning and decision making** *(poster)*.
Learning goal-directed behavior in humans and RNNs.

2021   **Champalimaud Research Symposium** *(poster)*.
Gaussian process latent variable models for neural data analysis.

2021   **Computational and Systems Neuroscience (Cosyne)** *(poster)*.
Beyond the Euclidean brain: inferring non-Euclidean latent trajectories from spike trains.

2020   **From Neuroscience to Artificially Intelligent System** *(poster)*.
Self-supervised learning for multisensory integration in biologically inspired networks.

2020   **Bernstein Conference** *(contributed talk)*.
mGPLVM – Beyond the Euclidean brain.

2018   **Janelia Undergraduate Scholars Symposium** *(poster)*.
Angular velocity integration in *Drosophila melanogaster*.