CURRICULUM VITAE WESSELBRUINSMA

ABOUT

wessel.p.bruinsma @gmail.com
Wessel Bruinsma
wesselb.github.io
Wessel Bruinsma
wesselb

LANGUAGES

dutch, native
english

INTERESTS

probabilistic modelling with a focus on time series, Bayesian nonparametrics with a focus on Gaussian processes, approximate inference, probabilistic programming, probability theory, and real analysis

EDUCATION

01/'18 – now **PhD** Machine Learning Group, University of Cambridge
- Supervised by Dr Richard Turner

10/'15 – 09/'16 **MPhil** Dept. of Engineering, University of Cambridge
- Distinction, class rank 1 / ∼20
- Machine learning and machine intelligence

09/'12 – 07/'15 **BSc (Hons)** EEMCS, Delft University of Technology
- Distinction, class rank 1 / ∼100
- Electrical engineering with a specialisation in mathematics

PROFESSIONAL HISTORY

07/'20 – now **External Embassador** Invenia Labs Limited, Cambridge
- Embassador for the company and supervision of projects

07/'20 – 09/'20 **Internship (Machine Learning)** Invenia Labs Limited, Cambridge

07/'19 – 09/'19 **Internship (Quantitative Research)** G-Research, London

09/'16 – 01/'18 **Machine Learning Researcher** Invenia Labs Limited, Cambridge
- Research into modelling multi-output time series, with a focus on electricity markets

09/'14 – 07/'15 **Technical Specialist** EEMCS Recruitment Days, Delft
- Design and implementation of solutions to scheduling problems

09/'13 – 07/'14 **Electrical Engineer** TU Delft Solar Boat Team, Delft
- Design and analysis of a power distribution system
- Competed in DONG Solar Energy Challenge 2014 and Solar1 Monte Carlo Cup 2014

AWARDS AND GRANTS

2018 – 2021 **International Doctoral Scholarship (IDS) Grant Covering PhD Fees and Stipend**

03/'16 **UfD – Damen Bachelor Award (EUR 2000)**

SELECTED PUBLICATIONS

[link] Foong, A. Y. K., Bruinsma W. P., Burt D. R., and Turner R. E. (2021). "How Small can PAC-Bayes be in the Small Data Regime?" arXiv:1802.08167.

[link] Bruinsma, W. P., Perim E., Tebbutt W., Hosking J. S., Solin A., Turner R. E. (2020). "Scalable Exact Inference in Multi-Output Gaussian Processes," *International Conference on Machine Learning (ICML), 37th*.

SELECTED SOFTWARE

[link] *Stheno*: Probabilistic programming with Gaussian processes in Python

PUBLICATIONS

[link] Markou S., Requeima J. R., Brunisma W. P., and Turner R. E. (2021). "Efficient Gaussian Neural Processes for Regression," *Uncertainty & Robustness in Deep Learning (UDL), ICML 2021 Workshop on"*.

[link] Foong, A. Y. K., Bruinsma W. P., Burt D. R., and Turner R. E. (2021). "How Small can PAC-Bayes be in the Small Data Regime?" arXiv:1802.08167.

[link] Bruinsma W. P., Requeima J., Foong, A. Y. K., Gordon. J., and Turner R. E. (2021). "The Gaussian Neural Process," *Advances in Approximate Bayesian Inference (AABI), 3rd Symposium on*. (Awarded contributed talk.)

[link] Xia, R., Bruinsma W. P., Tebbutt W., and Turner R. E. (2021). "The Gaussian Process Latent Autoregressive Model," *Advances in Approximate Bayesian Inference (AABI), 3rd Symposium on*.

[link] Foong, A. Y. K., Bruinsma W. P., Gordon. J., Dubois, Y., Requeima J., Turner R. E. (2020). "Meta-Learning Stationary Stochastic Process Prediction with Convolutional Neural Processes," *Advances in Neural Information Processing Systems (NeurIPS), 33th*.

[link] Bruinsma, W. P., Perim E., Tebbutt W., Hosking J. S., Solin A., Turner R. E. (2020). "Scalable Exact Inference in Multi-Output Gaussian Processes," *International Conference on Machine Learning (ICML), 37th*.

[link] Gordon, J., Bruinsma W. P., Foong, A. Y. K., Requeima, J., Dubois Y., Turner, R. E. (2020) "Convolutional Conditional Neural Processes," *International Conference on Learning Representations (ICLR), 8th*. (Awarded oral presentation.)

[link] Berkovich, P., Perim E., Bruinsma W. P. (2019) "GP-ALPS: Automatic Latent Process Selection for Multi-Output Gaussian Process Models," *Advanced in Approximate Bayesian Inference (AABI), 2nd Symposium on*.

[link] Requiema, J. R., Tebbutt, W. C., Bruinsma, W. P., Turner, R. E. (2019). "The Gaussian Process Autoregressive Regression Model (GPAR)." *Artificial Intelligence and Statistics (AISTATS), 22nd International Conference on*.

[link] Bruinsma, W. P., Turner, R. E. (2018). "Learning Causally-Generated Time Series," arXiv:1802.08167.

[link] Bosma, S., Bruinsma, W. P., Hes, R. P., Bentum, M. J., and Lager, I. E. (2017). "Grating Lobe Prediction in 3D Array Antennas." *Antennas and Propagation (EuCAP), 11th European Conference on*.

[link] Bruinsma, W. P., Hes, R. P., Bosma, S., Lager, I. E., and Bentum, M. J. (2016). "Radiation Properties of Moving Constellations of (Nano) Satellites: A Complexity Study." *Antennas and Propagation (EuCAP), 10th European Conference on*.

[link] Bentum, M. J., Lager, I. E., Bosma, S., Bruinsma, W. P., and Hes, R. P. (2015). "Beamforming in Sparse, Random, 3D Array Antennas with Fluctuating Element Locations." *Antennas and Propagation (EuCAP), 9th European Conference on*.

POSTERS

[link] Tebbutt, W. C., Bruinsma, W. P., and Turner R. E. (2019). "Gaussian Process Probabilistic Programming." *Probabilistic Programming (ProbProg), The International Conference on*.

MACHINE LEARNING SOFTWARE

[link] *Stheno*: Probabilistic programming with Gaussian processes in Python

[link] *GPAR*: Implementation of GPAR in Python

[link] *NeuralProcesses.jl*: A framework for composing Neural Processes in Julia

[link] *ConvCNP*: Implementation of the ConvCNP in Python

[link] *GPCM*: Implementation of several variants of the Gaussian Process Convolution Model in Python

[link] *OILMM*: Implementation of the OILMM in Python

[link] *MLKernels*: Flexible implementation of kernels in Python

OTHER SOFTWARE

[link] *Plum*: Implementation of multiple dispatch in Python

[link] *LAB*: A generic interface for linear algebra backends in Python

[link] *FDM*: Estimate derivatives with finite differences in Python

[link] *FiniteDifferences.jl*: Estimate derivatives with finite differences in Julia

[link] *Varz*: Painless variables in PyTorch and TensorFlow

[link] *Matrix*: Structured matrices in Python

[link] *Algebra*: Algebraic structures in Python

[link] *WBML*: A collection of machine learning things

[link] *Note*: Simple and quick note taking system

[link] *Catalogue*: Resource management with Alfred

[link] *wesselb.github.io*: My personal website

THESES

[link] Bruinsma W. P. (2019). "The Generalised Gaussian Process Convolution Model." Department of Engineering, University of Cambridge. Thesis for the degree Master of Philosophy.

[link] Bruinsma, W. P., Hes, R. P., Kroep, H. J. C., Leliveld, T. C., Melching, W. M., and aan de Wiel, T. A. (2015). "An Extensible Toolkit for Real-Time High-Performance Wideband Spectrum Sensing." Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology. Thesis for the degree Bachelor of Science.

REVIEWING

AISTATS 2022	**Reviewer**
ICML 2021	**Reviewer**
NeurIPS 2020	**Reviewer**

TEACHING

All teaching was done at the University of Cambridge.

Easter 2021	**Cosupervisor for MPhil Project**	MPhil in Machine Learning and Machine Intelligence
Lent 2021	**Supervisor for Inference**	Part IIA, Engineering Tripos
Michaelmas '21	**Supervisor for Introduction to ML**	MPhil in Machine Learning and Machine Intelligence
Easter 2020	**Cosupervisor for MPhil Project**	MPhil in Machine Learning and Machine Intelligence
Lent 2020	**Supervisor for Inference**	Part IIA, Engineering Tripos
Michaelmas '20	**Demonstrator**	AI for the study of Environmental Risks (CDT)
Michaelmas '20	**Demonstrator**	MPhil in Machine Learning and Machine Intelligence
Lent 2019	**Supervisor for Inference**	Part IIA, Engineering Tripos

FULL PORTFOLIO

See wesselb.github.io/portfolio for a full overview of my software, publications, posters, theses, talks, and write-ups.