

Louis Tiao

Machine Learning Research Scientist

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Education

Ph.D. Computer Science, University of Sydney	2023
<i>Supervisors: Fabio Ramos, Edwin Bonilla</i>	Sydney, Australia
B.Sc. (Honours 1st Class) Computer Science, University of New South Wales	2015
<i>Major concentrations: Artificial Intelligence, Mathematics</i>	Sydney, Australia

Employment

Applied Scientist Intern Amazon	May 2022 – Sep 2022 Cambridge, United Kingdom
<i>Hosts: Aaron Klein, Matthias Seeger, Cédric Archambeau</i>	
Doctoral Student Researcher Secondmind (PROWLER.io)	Sep 2021 – Apr 2022 Cambridge, United Kingdom
Applied Scientist Intern Amazon	Jun 2019 – Dec 2019 Berlin, Germany
<i>Hosts: Matthias Seeger, Aaron Klein, Cédric Archambeau</i>	
Teaching Assistant University of New South Wales (UNSW)	Aug 2017 – Nov 2018 Sydney, Australia
<i>Course: COMP9418 – Advanced Topics in Statistical Machine Learning</i>	
Research Software Engineer CSIRO Data61	Jun 2016 – Apr 2019 Sydney, Australia
Research Software Engineer National ICT Australia (NICTA)	Jun 2015 – Jun 2016 Sydney, Australia
Research Intern Commonwealth Scientific and Industrial Research Organisation (CSIRO)	Nov 2013 – Feb 2014 Sydney, Australia

Publications

1. **L. Tiao**, V. Dutordoir, and V. Picheny. Spherical Inducing Features for Orthogonally-Decoupled Gaussian Processes. In *Proceedings of the 40th International Conference on Machine Learning (ICML2023)*, Honolulu, Hawaii, July 2023. Accepted as **Oral Presentation**
2. R. Oliveira, **L. Tiao**, and F. Ramos. Batch Bayesian Optimisation via Density-Ratio Estimation with Guarantees. In *Advances in Neural Information Processing Systems 35 (NeurIPS2022)*, New Orleans, Louisiana, December 2022.

3. **L. Tiao**, A. Klein, C. Archambeau, E. V. Bonilla, M. Seeger, and F. Ramos. Bayesian Optimization by Density-Ratio Estimation. In *Proceedings of the 38th International Conference on Machine Learning (ICML2021)*, Virtual (Online), July 2021. Accepted as **Long Talk** (Awarded to top 3% of submissions).
4. P. Elinas, E. V. Bonilla, and **L. Tiao**. Variational Inference for Graph Convolutional Networks in the Absence of Graph Data and Adversarial Settings. In *Advances in Neural Information Processing Systems 33 (NeurIPS2020)*, Virtual (Online), December 2020. Accepted as **Spotlight Presentation** (Awarded to top 3% of submissions).

PREPRINTS

5. M. Seeger, A. Klein, T. Lienart, and **L. Tiao**. Simulation-based Scoring for Model-based Asynchronous Hyperparameter and Neural Architecture Search. In *ICLR2021 Neural Architecture Search*, Virtual (Online), May 2021.
6. **L. Tiao**, A. Klein, C. Archambeau, E. V. Bonilla, M. Seeger, and F. Ramos. Bayesian Optimization by Density Ratio Estimation. In *NeurIPS2020 MetaLearn*, Virtual (Online), December 2020. Accepted as **Contributed Talk** (Awarded to best 3 submissions).
7. A. Klein, **L. Tiao**, T. Lienart, C. Archambeau, and M. Seeger. Model-based Asynchronous Hyperparameter and Neural Architecture Search. *arXiv preprint arXiv:2003.10865*, June 2020.
8. **L. Tiao**, P. Elinas, H. Nguyen, and E. V. Bonilla. Variational Graph Convolutional Networks. In *NeurIPS2019 Graph Representation Learning*, Vancouver, Canada, December 2019. Accepted as **Outstanding Contribution Talk** (Awarded to best 3 submissions).
9. **L. Tiao**, E. V. Bonilla, and F. Ramos. Cycle-Consistent Adversarial Learning as Approximate Bayesian Inference. In *ICML2018 Theoretical Foundations and Applications of Deep Generative Models*, Stockholm, Sweden, July 2018. Accepted as **Contributed Talk**.

THESES

10. **L. Tiao**. Probabilistic Machine Learning in the Age of Deep Learning: New Perspectives for Gaussian Processes, Bayesian Optimization and Beyond. *PhD Thesis*, Sep 2023.
11. **L. Tiao**. Robust Non-convex Optimization in Reputation Aggregation Systems. *Undergraduate Honours Thesis (Advisor: Aleksandar Ignjatovic)*, May 2015.

Awards and Honors

Machine Learning Summer School (MLSS) 2021 Taipei Best Poster Award	2021
Selected to participate in MLSS2021 Taipei	2021
NeurIPS2020 Registration Award	2020
Australian Government Research Training Program (RTP) Scholarship (Full funding)	2017–
CSIRO Data61 Postgraduate Research Scholarship	2017–
UNSW Faculty of Engineering Dean’s Honours List for Academic Excellence	2013–2014
UNSW School of Computer Science and Engineering 3rd Year Undergraduate Performance Prize	2013

Software

GPflux: A Tensorflow/Keras framework for Deep Gaussian Processes V. Dutordoir, S.T. John, L. Tiao , and other members and collaborators of Secondmind Labs	2021–
BORE: A framework for Bayesian Optimization by Probabilistic Classification L. Tiao , A. Klein	2021–
AutoGluon: An AutoML toolkit for Deep Learning Members and collaborators of Amazon Web Services (AWS) Labs, L. Tiao (a core developer of the Gaussian process-based multi-fidelity searcher module)	2019–
Aboleth: A minimalistic TensorFlow framework for scalable Bayesian Deep Learning D. Steinberg, L. McCalman, L. Tiao	2017
revrand: A Python library for scalable Bayesian Generalized Linear Models D. Steinberg, L. Tiao , L. McCalman, A. Reid and S. O’Callaghan	2015
Scientific Python: Contributions to the releases of TensorFlow 1.3.0rc1, scikit-learn 0.19.1, SciPy 0.17.0, NLTK 3.0b1, Cartopy 0.14.1, and others	2014–

Academic Service

REVIEWER

ICML2024, NeurIPS2023, ICML2023, ICLR2023, NeurIPS2022, ICML2022, ICLR2022, NeurIPS2021, ICML2021 – <i>Best Reviewer Award (Top 10%)</i>	
1st International Conference on Automated Machine Learning (AutoML-Conf)	2022
AutoML-Conf Late-Breaking Workshop	2022
ICLR 2nd Workshop on on Neural Architecture Search	2021
NeurIPS 4th Workshop on Meta-Learning	2020
ICML 1st Workshop on Graph Representation Learning and Beyond	2020
Transactions on Machine Learning Research (TMLR)	2022–
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)	2019–

Talks

1. The 38th International Conference on Machine Learning (ICML2021) Jul 2021
2. European Laboratory for Learning and Intelligent Systems (ELLIS) AutoML Seminars May 2021
3. NeurIPS 4th Workshop on Meta-learning Dec 2020
4. Amazon Machine Learning Community Tech Talk Jun 2019
5. ICML Workshop on Theoretical Foundations and Applications of Deep Generative Models Jul 2018