

TAO LIN

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EDUCATION

École polytechnique fédérale de Lausanne, Switzerland

Sep. 2014 - Present

Master in Communication Systems, focus on data science.

Core Courses: Pattern Classification and Machine Learning, Mathematics of Data: from Theory to Computation, Big Data, Introduction to Natural Language Processing, Parallelism and Concurrency, TCP/IP Networking, and Algorithm.

Zhejiang University, China

Sep. 2010 - Jun. 2014

Bachelor of Engineering in System Science and Engineering (with honor).

Overall GPA : 3.83/4.0 (87.69/100), Major GPA : 3.93/4.0 (88.42/100)

Relevant Courses: Calculus, Linear Algebra, Differential Equations, Probability, Applied Statistics, Operational Research, Control Theory, Object-Oriented Programming, Computer Network, and some core courses of Electrical Engineering.

PUBLICATIONS

Conference

- Rachid Guerraoui, Anne-Marie Kermarrec, **Tao Lin**, Rhicheek Patra (alphabetical order). **What You Might Like To Read After Watching Interstellar**. The 43rd International Conference on Very Large Data Bases (VLDB 2017), Munich, Germany, 2017 (Under minor revision)
- **Tao Lin**¹, Tian Guo¹, Karl Aberer. **TreNet: Hybrid Neural Network for Learning the Local Trends in Time Series**. The 5th International Conference on Learning Representations (ICLR 2017), Toulon, France, 2017 (Under review)

Journal

- Zhenyu Wen, **Tao Lin**, Renyu Yang, Alexander Romanovsky, Raj Ranjan, Jie Xu and Changting Lin. **Security-Aware Microservice Orchestration under Uncertainty of Geo-distributed Clouds**. IEEE Transactions on Cloud Computing. (Under review)
- Zhenyu Wen, Renyu Yang, Peter Garraghan, **Tao Lin**, Jie Xu and Michael Rovatsos. **Fog Orchestration for IoT Services: Issues, Challenges and Directions**. IEEE Internet Computing, IEEE Computer Society (To appear, SCI-IF = 1.713 and Q1)
- Laurent Mouchiroud, Vincenzo Sorrentino, Evan G. Williams, Matteo Cornaglia, Michael V. Frochaux, **Tao Lin**, Amandine A. Nicolet-dit-Félix, Gopal Krishnamani, Tarik Ouhmad, Martin A.M. Gijs, Bart Deplancke, Johan Auwerx. **The Movement Tracker: A flexible system for automated movement analysis in invertebrate model organisms**. Current Protocols in Neuroscience.

WORK EXPERIENCE

Research Internship

Feb. 15, 2017 - Aug. 15, 2017

Research Internship at MLO Lab, EPFL.

EPFL, Switzerland

- Unsupervised feature learning on top of text through Generative Adversarial Network (GANs).

Teaching Assistant

Sep. 22, 2016 - Dec. 22, 2016

Master Level Course: Machine Learning.

EPFL, Switzerland

- Assisted in the design and the maintenance of practical/theory exercises and projects.

¹These two authors contributed equally.

Data Analyst Intern
Internship at Mitobridge Inc.

Jun. 23, 2016 - Sep. 23, 2016
Boston, USA

- Responsible for the project: Prioritization of Novel Indications for Existing Pharmaceutical Targets.
- Implemented various approaches to retrieve data from the Internet and processed the dirty datasets through traditional NLP techniques.
- Designed and developed the workflow for data reconciliation and undermined the potential indication for existing targets.

Data Analyst Intern
Internship at LISP Lab, EPFL.

Feb. 22, 2016 - Jun. 22, 2016
Lausanne, Switzerland

- Built a distributed crawler to retrieve the publications of NCBI.
- Designed and implemented a distributed text mining algorithm through Spark to evaluate the co-occurrence score of terms in the sentence- and document- level.

RESEARCH PROJECTS

Sequence Mining with Convolutional Recurrent Neural Network
Master Thesis at LSIR

Aug. 2016 - Present
Lausanne, Switzerland

- Proposed a framework that aims to learn from noisy and non-stationary time series and then forecasting the future trend of the time series based on such learned features.

Parallel Composition of Multi-Cloud Services

Oct. 2015 - Jun. 2016

- Modeled the uncertainty and security problem of QoS service selection on the Clouds, and transferred the real problem to a constrained multi-objective optimization problem.
- Designed a scalable genetic algorithm to solve the composition of multiple-Cloud services in parallel.

Cross-Domain Recommender System
Semester Project at LPD

Feb. 2015 - Dec. 2015
Lausanne, Switzerland

- Designed and established a *Collaborative Filtering algorithm* on the top of *Spark* for Amazon dataset.
- Proposed a novel path-based similarity extension metric to compute the inter-item similarities over several domains, and leverages differential privacy mechanism to cope with the privacy aspect.
- Tackled the “heterogeneity”, “privacy” and “scalability” challenges of recommender system.
- Improved the recommendation quality over alternative approaches by a margin of 6.2%, and scaled up by 5.2× when increasing to a cluster size of 15.

Gene-based simulation of biological fractal morphology evolution

Mar. 2014 - Jun. 2014

- Established a Gene regulation network through sequence correlation analysis, fractal evolution and morphology evolution.
- Designed and implemented a Cellular Automation to simulate the evolution process. The rules of Cellular Automation are extracted from the gene regulation network.

Non-linear Analysis of EEG

Oct. 2013 - Mar. 2014

- Adapted nonlinear algorithms (e.g., Largest Lyapunov Exponent, Phase space plot) to analyze the chaos characteristic of time series and developed a Matlab toolbox for the analysis of EEG signals.
- Mining the EEG data under the condition of collaboration and competition, and classified the underlying pattern of these two modes through nonlinear analysis.

MITSUBISHIELECTRIC Automation Competition

Jun. 2013 - Sep. 2013

- Coordinated to design a mechanical automation System “Integrated Automation System for Shaft Furnace Roasting Process” based on PLC, motion PLC and servo amplifier.
- Optimized the mechanical automation System through PLC programming.

COURSE PROJECTS

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|---|-----------------------|
| A Study of linguistic drift on Le Temps Newspaper Corpus | Feb. 2015 - May. 2015 |
| <ul style="list-style-type: none">· OCR correction on n-grams (based on TF-IDF, dictionary, etc.)· Cooperated with others to implement several distance metrics among text. | |
| Machine Learning in Action | Sep. 2014 - Dec. 2014 |
| <ul style="list-style-type: none">· Completed Person Detection task through multiple machine learning algorithms, e.g., Support Vector Machine, Neural Network, K-nearest neighbor and Random Forest. | |
| Multi-Agent systems | Sep. 2014 - Dec. 2014 |
| <ul style="list-style-type: none">· Implemented multi-agents system with varied strategies, i.e., Reactive agent (Markov Decision Processes); Deliberative agent (Breadth First Search and A* heuristic search algorithm); Centralized agent (Stochastic Local Search under a constraint satisfaction problem); Auction agent (Game Theory strategy). | |

HONORS & AWARDS

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| · Teaching Assistant Award for Machine Learning | 2016 |
| · Zhejiang University Outstanding Graduates | 2014 |
| · 1st prize of MITSUBISHIELECTRIC Automation Competition | 2013 |
| · Excellent Merit Student, Zhejiang University | 2011, 2012, 2013 |
| · 1rd prize of Excellent Undergraduate Scholarship, Zhejiang University | 2011 |

TECHNICAL STRENGTHS

Tools	Git, L ^A T _E X, Vim
Operating Systems	Linux, OS X
Programming Languages	Python, Scala, Java, R, Matlab, C/C++, SQL, PHP
Frameworks and Platforms	Docker, Apache Hadoop, Apache Spark, MongoDB, Google Cloud, Tensorflow

REFEREES

Martin Jaggi	Machine Learning and Optimization Laboratory martin.jaggi@epfl.ch
Karl Aberer	Distributed Information Systems Laboratory karl.aberer@epfl.ch
Guerraoui Rachid	Distributed Programming Laboratory rachid.guerraoui@epfl.ch