

# Lang Liu

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## Contact Information

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## Current Address

6400 NE Radford DR APT 627

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USA

## Education

**University of Washington, Seattle**

Sep. 2017 – Present

Ph.D. in Statistics (Machine Learning and Big Data Track)

Advisors: Zaid Harchaoui & Soumik Pal

**Tsinghua University, Beijing**

Sep. 2013 – Jun. 2017

B.S. in Mathematics and Applied Mathematics

Thesis: Bayesian Structure Learning for Stationary Time Series

## Preprint

Zaid Harchaoui, **Lang Liu**, Soumik Pal. Asymptotics of entropy-regularized optimal transport via chaos decomposition. *Preprint available at [arXiv](https://arxiv.org/abs/2008.08714), 2020.*

**Lang Liu**, Mahdi Milani Fard, Sen Zhao. Distribution embedding network for meta-learning with variable-length input. *Submitted.*

**Lang Liu**, Joseph Salmon, Zaid Harchaoui. Gradient-based monitoring of learning machines. *ICML Workshop on Challenges in Deploying and Monitoring Machine Learning Systems*, 2020.

## Software

*Autodetect*, a package of a gradient-based change detection method for monitoring learning machines as it learns from a continuous, possibly evolving, stream of data.

## Talks

Asymptotics of entropy-regularized optimal transport via chaos

- *UW Probability Seminar*, Nov. 2020.

Gradient-based monitoring of learning machines.

- *IFDS Kickoff Meeting Poster Session*, Sep. 2020.
- *Google Statistics Journal Club*, Sep. 2020.
- *Google Research NYC and Athena Org Intern Talks*, Jul. 2020.
- *ICML Workshop on Challenges in Deploying and Monitoring Machine Learning Systems*, Jul. 2020.

## Research Experience

**Graduate Research Assistant**

Jul. 2018 – Present

University of Washington, *Seattle*

Advisor: Zaid Harchaoui

**Undergraduate Research Assistant**

Dec. 2015 – Jul. 2017

Tsinghua University, *Beijing*

Advisor: Xuegong Zhang

**Research Intern**

Jul. 2016 – Sep. 2016

University of Washington, *Seattle*

Advisors: Emily Fox, Nicholas Foti

<b>Professional Experience</b>	<b>Data Scientist Intern</b> Jun. 2020 – Sep. 2020 Glassbox Machine Learning Team, <i>Google Research</i> Hosts: Sen Zhao & Mahdi Milani Fard
	<ul style="list-style-type: none"> <li>• Formalized a meta-learning framework for learning the optimal aggregation rule to combine base classifiers.</li> <li>• Proposed and implemented a novel meta-learning approach for applications where both the data distribution and the number of features could vary across tasks.</li> <li>• Developed a novel methodology to massively simulate binary classification training tasks for the proposed approach.</li> <li>• Demonstrated significant improvement compared to existing methods in numerical studies.</li> </ul>
	<b>Applied Scientist Intern</b> Jun. 2019 – Sep. 2019 Music Machine Learning Team, <i>Amazon</i> Manager & Mentor: Fabian Moerchen & Brandyn Kusenda
	<ul style="list-style-type: none"> <li>• Designed a deep track-query joint embedding model to search for relevant music entities given long tail queries.</li> <li>• Collected, analyzed, and processed a dataset on music playbacks using PySpark, and used it to train the joint embedding model.</li> <li>• Demonstrated significant improvements compared to existing approaches.</li> </ul>
<b>Honors and Awards</b>	Academic Excellence Award, <i>Department of Mathematics, Tsinghua University</i> 2015
	Honorable Mention in the Mathematical Contest in Modeling, <i>COMAP</i> 2015
	First Prize in the Math Olympiad, <i>Hunan Province, China</i> 2011 & 2012
<b>Teaching</b>	Tutorial on optimal transport in computational neuroscience, <i>Neurohackademy</i> 2020
	Teaching Assistant, <i>University of Washington</i>
	<ul style="list-style-type: none"> <li>• STAT 538: Statistical Learning 2019 &amp; 2020</li> <li>• STAT 311: Elements of Statistical Methods 2017 &amp; 2018</li> </ul>
	Tutor for mathematics, <i>Tsinghua University</i> 2015
<b>Professional Activities</b>	Reviewer for Neural Information Processing Systems (NeurIPS) 2020.
<b>Skills</b>	Python, R, C++, MATLAB