# Lan Huong **Nguyen**

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## Education

**Stanford University** *Stanford, CA*
PhD in Computational and Mathematical Engineering (GPA 3.9) *Sep. 2013 - Exp. Jun. 2019*

- *Robust non-linear dimensionality reduction and latent structure recovery*. Advised by Prof. Susan Holmes.
- Relevant coursework: numerical linear algebra, convex optimization, stochastic processes, probabilistic graphical models, distributed algorithms, statistical learning theory, Bayesian statistics, algorithms in advanced machine learning, theories of deep learning, statistical and machine learning methods for genomics

**California Institute of Technology** *Pasadena, CA*
B.S. in Applied Mathematics and Economics (GPA 3.8) *Sep. 2009 - Jun. 2013*

- Graduated with honors from the Department of Computing & Mathematical Sciences.

## Experience

**High-dimensional Data Statistics Graduate Research** *Stanford, CA*
Researcher in Holmes Lab *Sep. 2014 - PRESENT*

- Design robust dimensionality reduction and manifold learning methods for inferring latent structures and associated uncertainties in high-dimensional data
- Build statistical models for single cell RNA-seq and microbiome (16S, metagenomics, and metatranscriptomics) data
- Develop `R` and `Shiny` software packages implementing new data analysis and visualization techniques

**R for Data Science Introductory Course** *Stanford, CA*
Course Instructor for CME/STATS 195 *Fall '16, '17, '18*

- Created a short course on R application to data science covering topics such as data wrangling, exploration, visualization and modeling
- Taught a class of 60+ graduate and undergraduate students
- Course details and syllabus can be found at: `http://cme195.github.io`

**Genentech** *South San Francisco, CA*
Intern in Department of Bioinformatics *Jun. 2017 - Oct. 2017*

- Studied the role of COP1 in activation and repression kinetics of LPS-induced genes
- Developed an open-source Bioconductor package for analyzing and visualizing short time-course RNA-seq data

**AOL Advertising** *Palo Alto, CA*
Intern in Large-Scale Analytics Team *Jun. 2014 - Oct. 2014*

- Analyzed DoubleClick ad exchange auction bid dat consisting of ∼4-5 million entries per day
- Identified factors affecting winning rates of bids and developed classification models for predicting successful bidding
- Estimated market trends and winning price distribution. Designed Real Time Bidding algorithms

**Talentoday Startup** *Palo Alto, CA*
Consultanting Project *Sep. 2012 - Feb. 2013*

- Worked with 30k+ user data to find the most predictive survey questions using QR factorization, and sparse CCA.
- Developed an answer-imputation technique using binomial matrix completion.
- Reduced the number of questions by 30% while retaining high test accuracy.

## Skills

**Programming** Python, R, Matlab, C++, Spark, Scala, SQL
**Languages** English, Polish, Vietnamese

## Publications

L.H. Nguyen, S. Holmes. Diffusion t-SNE for manifold learning. *In preparation*

L.H. Nguyen, S. Holmes. Nine quick tips for effective dimensionality reduction. *Submitted to PLOS Computational Biology*

L.H. Nguyen., S. Holmes. Bayesian Unidimensional Scaling for visualizing uncertainty in high dimensional datasets with latent ordering of observations. *BMC Bioinformatics* (2017) `https://doi.org/10.1186/s12859-017-1790-x`

L.H. Nguyen. 'TimeSeriesExperiment' package for analysis and visualization of short time course data. *Bioconductor* (2018) `https://doi.org/doi:10.18129/B9.bioc.TimeSeriesExperiment`

J.A. Grembi, L.H. Nguyen, T.D. Haggerty, C.D. Gardner, S.P. Holmes and J. Parsonnet. Gut microbiota plasticity correlated with sustained weight loss after a low-carb or low-fat dietary intervention. *In preparation*

P.H.T. Kamga, B. Li, M. McKerns, L.H. Nguyen, M. Ortiz, H. Owhadi, and T.J. Sullivan. Optimal uncertainty quantification with model uncertainty and legacy data. *Journal of the Mechanics and Physics of Solids, 72* (2014) `http://dx.doi.org/10.1016/j.jmps.2014.07.007`

## Presentations

BioVis at International Society for Computational Biology — *Prague, Czech Republic, Jul. 2017*
Presented an accepted paper on Bayesian dimensionality reduction for recovering laternt ordering of samples.

Ascona Workshop 2017: Statistical Challenges in Single-Cell Biology — *Ascona, Switzerland, Apr. 2017*
Presented a poster on mathematics of t-SNE and diagnostics for choosing its hyperparameters.

ASA's Women in Statistics and Data Science — *Charlotte, NC, Oct. 2016*
Presented methods for detecting gradients in microbiome data based on indirect ordination. Invited student panelist.

useR 2016 — *Stanford, CA, Jun. 2016*
Presented `mvarVis`: An R package for Visualization of Multivariate Analysis Results.

Bioinformatics for Microbiome Symposium — *Stanford, CA, May 2016*
Presented a comparative study of differential abundance methods for analyzing sequencing data.

Additional Teaching Experience — *Stanford, CA, Oct. 2014 - Present*
Teaching assistant for: BIOS 221/STATS 366 Modern Statistics for Modern Biology, CS 261 Optimization and Algorithmic Paradigms, CME 200 Linear Algebra with Application to Engineering Computations, CME 106 Intro to Probability and Statistics

## Honors & Awards

**ICME Stanford University** — *Stanford, CA*
Senior Teaching Fellow — *2017-2018*
Institute of Computational and Mathematical Engineering teaching award.

**University of Chicago Midwest Trading Competition** — *Chicago, IL*
First Place — *Apr. 2013*
The UChicago Midwest Trading Competition is the nation's premier algorithmic trading competition. Participants are asked to develop algorithms to make automated trading decisions. The competition tests technical programming skills, financial acumen, and ability to adjust based on algorithm performance.

## Extracurricular Activities

**Stanford Women in Mathematics, Statistics and Computational Engineering** — *Stanford, CA*
Co-Founder and Financial officer — *Mar. 2018 - Present*

**Stanford Polish Student Association** — *Stanford, CA*
Co-president, financial officer — *Oct. 2016 - Jun. 2018*

**Asian American Graduate Students Association** — *Stanford, CA*
Core Member — *Jun. 2015 - Jun. 2016*