Yu-Chia Chen

📞 (206) 739-4801 📍 Paul Allen Center, 185 E Stevens Way NE AE100R, Seattle, WA 98195
✉ yuchaz@uw.edu 🔗 http://linkedin.com/in/yuchaz 🌐 http://yuchaz.github.io

EDUCATION	**University of Washington** , Seattle, WA	
	Ph.D. in Electrical Engineering, 3.92/4.00	Sep 2016 – present
	National Taiwan University, Taipei, Taiwan	
	B.S. in Physics, 3.72/4.20	Sep 2011 – Jun 2015

KNOWLEDGE & SKILLS

Research areas
- Manifold learning, Geometric data analysis, Dynamic networks, Embedding.
- With applications in Molecules dynamics simulation and Astronomy.

Technical skills
- Python, MATLAB, JavaScript, C++, Shell scripts, MySQL, Latex

Languages
- English: Advanced, Mandarin: Native

WORK EXPERIENCE

Microsoft Research, Redmond, WA
Research Intern   Jun 2018 – Sep 2018
- Proposed an novel approach to model large scale dynamic networks based on stochastic block model.
- Extended the model to study causal impact on temporal networks.
- Paper [2] accepted to KDD 2019 research track (acceptance rate 14.2%).

University of Washington, Seattle, WA
Teaching Assistant   Jan 2017 – Dec 2017
- Course taught: Fundamentals of Electrical Engineering, Discrete Time Linear Systems, Devices And Circuits I, Digital Signal Processing (graduate level course).

Psychological Warfare Group of M.N.D., Taipei, Taiwan
Front End Software Engineer   Aug 2015 – Jul 2016
- Developed a cloud-based file exchanging platform, which enabled user to search, view and share streaming media.
- Technology used: JavaScript (*react.js*), HMTL/CSS.

RESEARCH EXPERIENCE

Geometric Data Analysis Group, University of Washington   Apr 2017 – present
Advisor: professor Marina Meilă.
Selecting the independent coordinates of manifolds with large aspect ratios.
- Criterion based subset selection algorithm for finding independent coordinates that produce smooth embedding.
- Low computational overhead in combinatorial search space.
- Paper [1] accepted to NeurIPS 2019 (acceptance rate 21.2%).

Randomized graph Laplacian construction algorithm for large scale manifold learning.
- Random projection based partitioning scheme in efficiently constructing approximate neighbor graph.
- Generated well conditioned graph Laplacian which lends itself to fast and simple eigen-solvers.

Leveraging semi-supervised learning with intrinsic geometric information.
- Embed geometric information (graph laplacian) in the kernel of Gaussian process.
- Predicted the energy and potential reaction coordinates of molecules dynamics data.

Photonics Lab, University of Washington   Sep 2016 – Dec 2016
Advisor: professor Lih Lin.
- Investigated high accuracy mass sensing using Nanostructure-enhanced laser tweezers integrated MEMS
- Worked on the stem cell trapping and patterning assisted by laser tweezers [4].

Semiconductor Laboratory, National Taiwan University   Feb 2014 – Jun 2015
Advisor: professor Yang-Fang Chen.
- Investigated bio-photonics devices with wide spectrum range [5].
- Studied Perovskite and CdTe core shell quantum dots assisted random laser in bio-inspired materials [6].

HONORS & AWARDS

KDD Student Travel Award	Jun 2019
Taipower Academic Scholarship	May 2012 & May 2013
Second prizes in the Physics Scholastic Ability Contest, Kaohsiung, Taiwan	Dec 2010

COURSE PROJECTS

Selfie Sensei: Convolutional Neural Network based selfie instructor
- Built and trained the Google Inception-v3 model on 40 thousand selfies collected from twitter with hashtag *#selfie*.
- Technology used: Python (*tensorflow*).

Large scale medical subject heading (MeSH) term indexing.
- Built CNN trained with *skipgram* word2vec embedding in annotating 27k MeSH terms on 12M academic articles.
- Technology used: Python (*tensorflow*).

PUBLICATIONS

[1] Yu-Chia Chen and Marina Meilă. Selecting the independent coordinates of manifolds with large aspect ratios. *Advances in Neural Information Processing Systems*, 2019. (To appear)

[2] Yu-Chia Chen, Avleen S Bijral, and Juan Lavista Ferres. On dynamic network models and application to causal impact. In *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining*, pages 1194–1204. ACM, 2019

[3] Yu-Chia Chen, Dominique Perrault-Joncas, Marina Meilă, and James McQueen. Improved Graph Laplacian via Geometric Self-Consistency. NIPS Workshop on NIPS Highlights (MLTrain), Learn How to code a paper with state of the art frameworks, Long Beach, CA, December 2017.

[4] Peifeng Jing, Kosuke Winston, Yu-Chia Chen, Benjamin S Freedman, and Lih Y Lin. Patterning and colonizing stem cells with optical trapping. In *Optical Trapping Applications*, pages OtM4E–2. Optical Society of America, 2017

[5] Yu-Chia Chen, Cih-Su Wang, Tsung-Yuan Chang, Tai-Yuan Lin, Hsiu-Mei Lin, and Yang-Fang Chen. Ultraviolet and visible random lasers assisted by diatom frustules. *Optics express*, 23(12):16224–16231, 2015

[6] Cih-Su Wang, Chi-Shung Liau, Tzu-Ming Sun, Yu-Chia Chen, Tai-Yuan Lin, and Yang-Fang Chen. Biologically inspired band-edge laser action from semiconductor with dipole-forbidden band-gap transition. *Scientific reports*, 5:8965, 2015

REFERENCES

Marina Meilă
Department of Statistics, University of Washington
mmp2@uw.edu

Avleen Bijral
Microsoft Corporation
avbijral@microsoft.com

Les Atlas
Department of Electrical & Computer Engineering, University of Washington
atlas@u.washington.edu

Yang-Fang Chen
Department of Physics, National Taiwan University,
yfchen@phys.ntu.edu.tw