

Yu-Chia Chen

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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 <ul style="list-style-type: none">• Manifold learning, Geometric data analysis, Dynamic networks, Embedding.• With applications in Molecules dynamics simulation and Astronomy.	
	Technical skills <ul style="list-style-type: none">• Python, MATLAB, JavaScript, C++, Shell scripts, MySQL, Latex	
	Languages <ul style="list-style-type: none">• English: Advanced, Mandarin: Native	
WORK EXPERIENCE	Microsoft Research , Redmond, WA Research Intern	Jun 2018 – Sep 2018
	<ul style="list-style-type: none">• 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 [1] accepted to KDD 2019 research track (acceptance rate 14.2%).	
	University of Washington , Seattle, WA Teaching Assistant	Jan 2017 – Dec 2017
	<ul style="list-style-type: none">• 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
RESEARCH EXPERIENCE	<ul style="list-style-type: none">• Developed a cloud-based file exchanging platform, which enabled user to search, view and share streaming media.• Technology used: JavaScript (<i>react.js</i>), HMTL/CSS.	
	Geometric Data Analysis Group , University of Washington Advisor: professor Marina Meilă.	Apr 2017 – present
	<i>Selecting the independent coordinates of manifolds with large aspect ratios</i> [2]. <ul style="list-style-type: none">• Criterion based subset selection algorithm for finding independent coordinates that produce smooth embedding.• Low computational overhead in combinatorial search space.	
	<i>Randomized graph Laplacian construction algorithm for large scale manifold learning.</i> <ul style="list-style-type: none">• 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.	
	<i>Leveraging semi-supervised learning with intrinsic geometric information.</i> <ul style="list-style-type: none">• 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 Advisor: professor Lih Lin.	Sep 2016 – Dec 2016
HONORS & AWARDS	<ul style="list-style-type: none">• 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 Advisor: professor Yang-Fang Chen.	Feb 2014 – Jun 2015
	<ul style="list-style-type: none">• 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].	
	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, 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
- [2] Yu-Chia Chen and Marina Meilă. Selecting the independent coordinates of manifolds with large aspect ratios. *arXiv preprint arXiv:1907.01651*, 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 Liao, 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

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