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
- 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 [1] 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 [2].
- Criterion based subset selection algorithm for finding independent coordinates that produce smooth embedding.
- Low computational overhead in combinatorial search space.

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, Avleen Bijral, and Juan Lavista Ferres. On Dynamic Network Models and Application to Causal Impact. In *Proceedings of the 25TH ACM SIGKDD Conference on Knowledge Discovery & Data Mining*. ACM, 2019. (To appear)

[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 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

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