David Fan

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Education

Princeton University *Sept. 2015 - June 2019*

B.S.E in Computer Science *Magna Cum Laude (High Honors)*

- *Advisor:* Jia Deng
- *Relevant Courses:* (Grad) Computer Vision, Machine Learning, Optimization, Probability and Stochastic Systems, Algorithms

Publications

Peer-Reviewed

1. Weifeng Chen, Shengyi Qian, **David Fan**, Noriyuki Kojima, Max Hamilton, Jia Deng. OASIS: A Large-Scale Dataset for Single Image 3D in the Wild. *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.
2. Zachary A Kopp, Jo-Lin Hsieh, ..., **David Fan**, ..., Yongkyu Park. Heart-specific Rpd3 Downregulation Enhances Cardiac Function and Longevity. *Aging*, 2015.
3. Shi-Zeng Lin, Xueyun Wang, ..., **David Fan**, ..., Sang-Wook Cheong. Topological defects as relics of emergent continuous symmetry and Higgs condensation of disorder in ferroelectrics. *Nature Physics*, 2014.

Preprint

1. Jean Fan, **David Fan**, Kamil Slowikowski, Nils Gehlenborg, Peter Kharchenko. UBiT2: a client-side web-application for gene expression data analysis. *bioRxiv doi:10.1101/118992*, 2017.

Research / Work Experience

Amazon *Seattle, WA*

Research Engineer *July 2020 - current*

- Working on computer vision research with a current focus on video understanding for Prime Video.

Amazon Web Services *Seattle, WA*

Software Engineer *Aug. 2019 - July 2020*

- Added logging metrics and launched canaries to support new EC2 G4 instance family based accelerators.
- Launched Elastic Inference-enabled PyTorch (blog post) for SageMaker, EC2, ECS.
- Implemented TorchScript graph validation, shipped updated AWS Deep Learning Conda environments and Docker containers, benchmarked performance, wrote blog post.
- Created proof-of-concept for building and integrating TensorRT-enabled TensorFlow 2.1 into the inference engine. Reduced latency by up to 70% compared to FP32 native TensorFlow in benchmarks.

Princeton Vision and Learning Lab (Prof. Jia Deng) *Princeton, NJ*

Undergraduate Researcher *Sept. 2018 - July 2019*

- Created new large-scale dataset for single-image 3D in the wild. Implemented novel pipeline for crowdsourcing dense pixel-wise 3D ground truths from sparse annotations. Trained state-of-art deep learning models to benchmark dataset for multiple tasks.
- Dataset improves performance in multiple single-image 3D tasks. Paper accepted to CVPR 2020.

Amazon Web Services *East Palo Alto, CA*

Software Engineering Intern *June 2018 - Aug. 2018*

- Developed production Java service for automated ticket resolution that translates standard operational procedures into code.
- Wrote script for applying autoscaling policies and provisioning IOPS for DynamoDB tables.

Phosphorus *New York, NY*

Software Engineering Intern *May 2017 - Aug. 2017*

- Redesigned management portal and implemented custom UI/UX components in admin dashboard using Wicket and Scala.
- Created distributor preference model in Scala, Spring Boot, Hibernate, and PostgreSQL. Wrote AWS Cloud Formation templates.

Harvard-MIT HST (Biomedical Informatics) *Boston, MA*

Research Intern *June 2016 - Aug. 2016*

- Developed web app for visualizing geographic trends in AETNA insurance and US Census data using R Shiny and MySQL. Mentored by Prof. Arjun Manrai and Dept. Chair Isaac Kohane.
- Contributed to open-source client-side web application for bioinformatic analyses called ubit2.com

Leadership

HackPrinceton *Princeton, NJ*

Director *Sept. 2016 - Apr. 2018*

- Princeton's biannual hackathon hosts 1,100 students from around the world each year. Led 30 organizers and raised $130,000 in funding as head director of HackPrinceton Fall 2017 and Spring 2018.
- Organized logistics and hacker experience for Fall 2016 and Spring 2017.
- Past website: https://f17.hackprinceton.com

Princeton University Science Olympiad *Princeton, NJ*

Co-founder *Sept. 2016 - 2019*

- 800 of the USA's top high school students compete at the annual Princeton University Science Olympiad invitational tournament.
- Founded organization in 2016 and directed a team of 10 organizers + 100 volunteers to run the inaugural tournament. Coordinated 23 competition events and over 100 student volunteers.
- Created website and organizational presence: https://scioly.princeton.edu.

Princeton University Math Competition *Princeton, NJ*

Logistics Director *Sept. 2016 - Nov. 2016*

- Directed logistics for one of the nation's premier high school math competitions.

Select Software Projects

Single-Image Normal Estimation *2018*

- Implemented hourglass network architecture from NeurIPS 2016 paper and trained on internal dataset for Princeton competition. Used data augmentations and learning rate scheduling to win 1st place.
- Code: https://github.com/dfan/single-image-surface-normal-estimation

TigerTexts *2018*

- Web app that consolidates Princeton student coursebook pricing information from multiple sources and offers third-party seller platform. Uses the MERN (MongoDB, Express, React.js, Node.js) stack.
- Documentation and technical report: https://tigertexts.herokuapp.com/about
- Code: https://github.com/rfblue2/tigertexts

UBiT2 *2016*

- Lightweight client-side web app for visualization + analysis of RNA-seq + qPCR data. Computation entirely in browser.
- Link: ubit2.com | Code: https://github.com/JEFWorks/ubit2

Honors & Awards

Kaggle Bronze Medal (Google Open Images – Object Detection)	2019
Sigma Xi Award for Outstanding Undergraduate Research, Princeton University	2019
Finalist for Class of 1901 Medal, Princeton University	2019
Intel Science Talent Search Semifinalist	2015

Skills

Languages	Python, Java, R, Javascript, Go, OCaml, MatLab, C/C++
Libraries	PyTorch, TorchScript, TensorFlow, OpenCV, Shiny
Web Development	Django, Express.js | HTML5, React, Hugo, Jekyll
Databases	MySQL, MongoDB, DynamoDB
Other	AWS, Docker, Git, UNIX, LaTeX, Leadership