Zhenghao PENG

Apt. 104, Jinan Garden Bldg. 17, Jinan University   Email: pengzh@sjtu.edu.cn   Github: pengzhenghao

Guangzhou (Canton), P.R.China, 510630   Homepage: pengzhenghao.com   Phone: +86 158-2187-8978

EDUCATION

Shanghai Jiao Tong University *September 2015 - Present*
- Member of Zhiyuan Honors Program (Top 10% students at whole university).
- Won Zhiyuan Honors Scholarship for 2 consecutive years.

University of California, Berkeley *July 2017 - August 2017*
- Summer school, enrolled in two elective humanities courses.

RESEARCH EXPERIENCE

SIAT[1], Chinese Academy of Sciences *June 2018 - Present*
Research Intern *Shenzhen, China*
- Recommended by Prof. Li Jiang, I am visiting Center for Multimedia Technologies, SIAT to conduct a project on weakly-supervised action detection, under the supervision of Prof. Xiaoou Tang and Prof. Yu Qiao. Please see below for details.

Advanced Computer Architecture Laboratory, SJTU[2] *September 2017 - Present*
Research Assistant *Shanghai, China*
- Working on fields like neural network based approximate computing, neural network computing acceleration, and machine learning aided IC design. I work more than 70 hours each week in lab, under the supervision of Prof. Li Jiang.
- Contributing as a Machine Learning (ML) consultant, I have joined more than 5 projects, provided suggestions on ML and led to 2 works [1,2]. Here is a sample providing mathematical proof of a phenomena occurred in experience.

PROJECT EXPERIENCE

Neural Network Based Approximate Computing Framework: AXNet *September 2017 - May 2018*
- I proposed a novel architecture to conduct approximate computing, which highly reduces the training time and improves the performance compared to previous work.
- This work [1] was accepted to the top conference in computer architecture ICCAD'18, and before that it was also accepted as poster in DAC'18.[3]
- 15 minutes speech has been made in CTC'18[4] on this work. See blog post.

Weakly-supervised Video Action Detection via Convex Clustering *July 2017 - Present*
- Proposed a weakly supervised video action recognition framework which leverages attention module and an external representativeness database.
- I am paying effort on this project with 30+ paper read and 12+ hours work each day.

Wire Routing on Integral Circuits by Multi-agent Reinforcement Learning *February 2018 - June 2018*
- Formulate classic wire routing problem to a competitive-cooperative multi-agent reinforcement learning problem.
- Wire routing problem is a typical NP-hard problem, and hopefully can be solved by Reinforcement Learning.
- Due to the lack of experience and the hard of the problem, this project is currently on hold.

Approximate Random Dropout *February 2018 - Present*
- By replacing random dropout mechanism in neural network training procedure with predefined dropout patterns, we can foreknow dropped neurons and thus reduce redundant zero-multiplication in matrix computation.
- This work is in progress and targeted to AAAI this year [2].

PUBLICATION

[1] Z. Peng, X. Chen, C. Xu, N. Jing, X. Liang, C. Lu, and L. Jiang, "AXNet: ApproXimate computing using an end-to-end trainable neural network," *ArXiv e-prints*, July 2018 (Accepted to ICCAD'18) [arXiv, pdf]

[2] Z. Song, D. Ru, R. Wang, H. Huang, Z. Peng, J. Ke, X. Liang, and L. Jiang, "Approximate random dropout," *CoRR*, vol. abs/1805.08939, 2018 (In Progress) [arXiv, pdf]

SKILLS

Programming Languages	Python, C++, Matlab, HTML, CSS, etc.
ML Frameworks	TensorFlow, PyTorch, Keras, etc.
Tools	macOS, Git, LaTeX, OmniFocus, PyCharm, Zotero, Keynote, Matplotlib, Photoshop, Final Cut, etc.
Languages	Mandarin Chinese (Native), Cantonese (Native), English (TOEFL 100)

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[1] Shenzhen Institutes of Advanced Technology.
[2] Shanghai Jiao Tong University.
[3] DAC: Design Automation Conference. ICCAD: International Conference on Computer-Aided Design.
[4] China Testing Conference, 15 of August, 2018, Harbin.