Xueqiao PENG

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EDUCATION & ACADEMIC VISITINGS

University of Electronic Science and Technology of China, Chengdu, SC, China — Sept. 2017 – Jun. 2021
B.S. Degree in Software Engineering — **GPA: 3.71/4.0**

Curriculum Highlights Mathematics and Statistics: Discrete mathematics (86), Probability theory and mathematical statistics (85), Calculus (91), Big data computing technology (87).
Computer Science: C language programming (84), Data structures and algorithms (81), Computer organization (83), Computer graphics (92), Compilation principles (87), Embedded system design (93), Cloud computing fundamentals (88).

PUBLICATIONS & MANUSCRIPTS

- Yuke Wang, Boyuan Feng, **Xueqiao Peng**, Yufei Ding.
  Convolution Neural Network Architecture Optimization via Information Field.
  AAAI, 2021. Submitted. *https://arxiv.org/abs/2009.05236*
- Boyuan Feng, Yuke Wang, Xu Li, Shu Yang, **Xueqiao Peng**, Yufei Ding.
  SGQuant: Squeezing the Last Bit on Graph Neural Networks with Specialized Quantization.
  ICTAI, 2020. Accepted. *https://arxiv.org/abs/2007.05100*
- Yan Kuang, Tian Lan, **Xueqiao Peng**, Gati Elvis Selasi, Qiao Liu, Junyi Zhang.
  Unsupervised Multi-discriminator Generative Adversarial Network for Lung Nodule Malignancy Classification.
  IEEE Access, 2019. Accepted. *https://ieeexplore.ieee.org/abstract/document/9066829*

RESEARCH EXPERIENCE

Department of Computer Science, University of California, Santa Barbara, USA — Advisor: Dr. Yufei Ding
Undergraduate Research Assistant — Mar. 2020 – Now

Information Field (CNNIF)

- Proposed **Information Field** to estimate the quality of a CNN architecture and guide the design search process.
- Built a static optimizer to improve the CNN architectures at both **the stage level** and **the kernel level** to validate the effectiveness of Information Field.
- Inspired by the optimizer at the kernel level, designed **unexplored convolution blocks** and **a new type of factorized kernel**.
- Accomplished the **stage-level organizer** and was responsible for proofreading the paper for AAAI 2021.

Specialized Quantization (SGQuant)

- Proposed a specialized **GNN quantization scheme**, **SGQuant**, to systematically reduce GNN memory consumption.
- Designed a GNN-tailored quantization algorithm and a GNN quantization fine-tuning scheme to reduce memory consumption.
- Investigated the multi-granularity quantization strategy that operates at different levels (components, graph topology, and layers) of GNN computation.
- Offered an automatic bit-selection (ABS) to pinpoint the most appropriate quantization bits for the above multi-granularity quantization.

Sliding-Channel Convolutions (DSXplore)

- Proposed **DSXplore**, an efficient deep separable convolution on GPU.
- Designed a novel deep separable convolution, **sliding convolution**, combined with channel overlapping that can significantly overcome the accuracy drop from existing convolutions at algorithmic optimization.
- Reduced **the atomic operation** during the forward and backward phases by leveraging the output-centric and input-centric thread mapping techniques at the implementation level.
- Fully integrated DSXplore with the Pytorch framework to improve programmability and accessibility.

Network and Data Security Lab, UESTC, Chengdu, China Advisor: Dr. Tian Lan
Undergraduate Research Assistant Sep. 2018 – Feb. 2020

Multi-Discriminator Generative Adversarial Network (MDGAN)

- Focused on **Unsupervised Learning** in pulmonary medical image processing.
- Built an **Unsupervised Multi-Discriminator Generation Adversarial Network** combined with encoder to classify benign and malignant lung nodules; calculated the MDGAN discriminator feature loss and image reconstruction loss to score the malignancy.
- Accomplished **Image Preprocessing** of pulmonary nodules in the experiment and was responsible for the translation and typesetting of the paper for IEEE Access, 2019.

School of Information and Software Engineering, UESTC, Chengdu, China Advisor: Dr. Li Yi
Undergraduate Research Assistant Oct. 2019 – Jan. 2020

Image classification website based on Dense-Net

- Developed a website for classification with **image recognition, independent editing, comments, collection, and other personalized functions**.
- Trained the **Dense-Net Network** from dataset Cifar100, using TensorFlow in Python.

School of Information and Software Engineering, UESTC, Chengdu, China Advisor: Dr. Ping Kuang
Undergraduate Research Assistant Sept. 2019 – Oct. 2019

AR based on web

- Devised an experiment showing different 3D models using markers recognition, functional on all platforms.
- Employed a 3D mario model implementing aframe, came with custom components which integrated it on the screen.
- Designed a marker “hiro”; allowed mobile phone or computer camera to recognize the marker and display a 3D model on the screen of the device.

School of Information and Software Engineering, UESTC, Chengdu, China Advisor: Dr. Erqiang Zhou
Undergraduate Research Assistant Oct. 2018 – Nov. 2018

Lexer

- Built a **Lexer** to identify the validity of input text and output the judgement process and results.
- Adopted a **top-down grammar**, which enables the Lexer to construct a predictive analytical chart and evaluates the next step of the lexer by comparing the top of the stack to input text.

SELECTED SKILLS

Computer Skills	Python, C/C++, Java, PostgreSQL, LATEX, Linux
Language	Chinese (native), IELTS: 7.0 (R7.5+L7.5+S6.0+W6.0)