

# ZhuoHao Lee

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## EDUCATION

- Shanghai Jiao Tong University** Shanghai, China  
• B.Eng in Microelectronics, **Additional Major in Computer Science** Sept 2019 - June 2023 (*Expected*)  
**GPA: Junior** 91.6/100, Rank 2/70 | **Micro GPA** 87/100 | **Comp GPA** 91/100  
**A+ Courses:** Digital Integration Circuits, Algorithm, Computer Architecture, Embedded System, and 18 others
- Chengdu NO.7 High** Chengdu, China  
• Class of Competition Students, **Major in Math Competition** Sept 2016 - Jun 2019  
**GaoKao:** 693/750 (Top 0.01%) | Math: 146/150 | Physics: 108/110 | English: 148/150

## PUBLICATION & MANUSCRIPTS

- Sparsifier: Pruning Extra Ratio and Algorithm-Hardware Models for Speeding up Networks in Post-Training:** Zhanda Zhu, Cong Guo, [Zhuohao Li](#), Jingwen Leng, et al. in late Apr 2022.  
to be published by *IEEE/ACM International Symposium on Microarchitecture (MICRO '22)* [PDF][Code]
- RealNet: Combining Optimized Object Detection with Information Fusion Depth Estimation Co-Design:** [Zhuohao Li](#), Fandi Gou, Qixin De, et al. at April 2022  
to be published on *arXiv* version [PDF][Code]

## INTERNSHIP & ATTENDANCE

- Apple** Shanghai, China  
• Campus Talent (10 Undergrads in Shanghai) Sept 2021
- ISSCC 2022 Circuits insights** Online  
• Register for ISSCC 22' attendance and participate in a pre-talk before meeting Feb 2022
- Alibaba CRO Group, Alibaba** Hangzhou&Shanghai China  
• Research Assistance & Campus Talent at CRO (Alibaba Security) Nov 2021 - Present
  - **Responsible:** Maintain and test new security technology and encryption technology. The main research top is voice security technology, voiceprint classification, audio classification, speech risk recognition technology based on degree learning, and provides services such as identity recognition and speech content risk detection.
  - **Responsible:** Also work closely with **Damo** Autodriving Lab

## RESEARCH EXPERIENCE

- John Hopcroft Center for Computer Science, Shanghai Jiao Tong University** Shanghai, China  
• **Sparsifier, an Algo-HW co-design system enforcing sparsity in network** Aug 2021 - Apr 2022  
*Research Intern*, advised by Prof. Jingwen Leng
  - **Innovation:** Proposed Sparsifier, a system combining algorithmic and architecture co-optimization to exploit layer-wise N:M structured sparsity in the activation during post-training inference, post-fine-tuning inference and training.
  - **Innovation:** Designed a sparsifier in the L2 cache, which can prune data to satisfy N:M structured sparsity pattern on the fly and embed the indices directly into the data to further avoid the memory footprint of indices.
  - **Innovation:** Designed a scheduler using heuristic greedy algorithm to determine the sparsity ratio of each layer, leading to over 50% memory footprint and flops reduction for the pretrained ResNet50 in ImageNet without any fine-tuning.
  - **Outcome:** Improved speed by 16% approximately, with little accuracy loss. Future work will be accurately simulate the performance by hardware
- Computer System and Architecture Group(CSAG), University of Texas, Austin** Austin, TX, US  
• **Machine Learning in Prefetching** Jan 2022 - Present  
*Research Intern*, advised by Prof. Calvin Lin
  - **Innovation:** Plan to use temporal prefetcher and BranchNet idea to build a machine learning system to do better prefetching in architecture

## INDEPENDENT PROJECTS

- NoC Mesh System** Shanghai, China  
• Team leader, co-creator with a team of 4 Feb 2022-Present
  - **Innovation:** Lead a group focusing on the whole process of designing a  $2 \times 2$  mesh architecture NoC (Network-on-Chip), including router algorithm, switch judgement and allocation, conflict handler and RR, from RTL, logic synthesis, physical synthesis and layout.(Real chip in process)
  - **Outcome:** In the progress of DC synthesis and Physical Synthesis 🚧
- Shuiding: Advanced English Learning Platform with Enormous Resources** Shanghai, China  
• Team leader, co-creator with a team of 6 Sept 2021 - Jan 2022
  - **Innovation:** Lead a group building a mobile app on the fly based on Node.js, react.

- **Innovation:** develop an App "Shuiding Yuku" for English learners. This app encourage you to read articles with highlighted key words and explanation. You can also imitate the sentences and acquire a score by AI referee. We develop the user instruction and software structure development textbook following the Google process of development.I'm responsible for the front-end design.
  - **Outcome:** Test in SJTU, has a good reflect and A+ in course 🏆
- **LemonOS: Totally Fresh OS based on C++** Shanghai, China
  - Open source contributor *Mar 2022 - Present*
  - **Innovation:** Open source project for light weight OS on high-level C++
  - **Outcome:** In the progress 🏆
- **RealNet: Co-Design System on LoT, Real-time Devices** Shanghai, China
  - Team leader, co-creator with a team of 6 *Jan 2021 - Mar 2022*
  - **Innovation:** This is a lab project and extension for Huawei Automation Competition. We are aimed to use less expensive hardware to increase the automatic driving accuracy, both in avoiding obstacles and tracing others.
  - **Innovation:** We use Yolo-v5 for object detection. We simplify the convolution layers to increase the training process. We also try Yolo-x then. As for the depth estimation, we implement Semantic-aware-NN (NYU-Depth), VNL-Monocular-Depth-Prediction. We add some function we need such as the API to calculate the actual depth instead of relative depth.
  - **Innovation:** Depth information fusion is available in the project, which has a great outcome in real-time device
  - **Outcome:** arXiv: Combining Optimized Obeject Detection with Information Fusion Depth Estimation Co-Design. Total increasing speed up to 16% in the system 🏆

## SELECTED AWARDS

- **Excellent Undergraduates Scholarship** Shanghai Jiao Tong University(2020,2021,2022)
- **Top10 Team, Honor Leader in Google Cup** Google Inc.(2021)
- **Bronze Medal** 7th National Internet+ Innovation Competition(2021)
- **Silver Medal** 11th National E-commerce Innovation, Creativity and Entrepreneurship Comprtition(2021)

## LEADERSHIP & OTHER HIGHLIGHTS

- **Student Union, School of Electronic Information and Electrical Engineering, SJTU** Shanghai, China
  - President *Sept 2020- Dec 2021*
- **Art Center, SJTU** Shanghai, China
  - President *Mar 2020 - Dec 2021*
- **Super-computing Team, SJTU** Shanghai, China
  - Captain *Feb 2022 - July 2022*
- **Video Vlogger & Phtograph Lover**
  - **Vlogger:** Make vlogs through my social media. With the theme of phtograph and personal life
  - **Result:** One video is over 310k+ views and over 4k+ likes, more than 15k fans over all media

## SKILLS

<b>Tools &amp; Programming Languages</b>	C++(Proficient) HTML(Skilled) Bash(Skilled)	Python(Proficient) Perl(Skilled) HSPICE(Skilled)	Verilog(Proficient) Java(Skilled) TeX(Skilled)
<b>Framework</b>	<i>Machine Learning</i> <i>Tools</i> <i>Simulation</i>	Pytorch(Skilled) Docker(Skilled) Vivado(Skilled) Modelsim(Skilled)	Git(Proficient) Cadence(Skilled)
<b>Fundamental Knowledge</b>	Algorithm & Data Structure	MOS Device	Computer Architecture
<b>Languages</b>	Mandarin(Native)	English(TOEFL iBT: 103)	
<b>Interests</b>	Photograh	Vlog(Proficient in Adobe)	Stage Art