Alan De-Hao Cheng

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Education

2019–2020 (Masters)
Massachusetts Institute of Technology, *Cambridge, MA*, GPA - 4.5/5.0
Candidate for Master's of Engineering in Electrical Engineering and Computer Science

2015–2019 (Bachelors)
Bachelor of Science in Electrical Engineering and Computer Science
Selected Coursework: ● Computer Vision ● Computational Photography ● Computer Graphics ● Computer Systems ● Digital Systems Laboratory ● Machine Learning ● UI/UX Design ● Elements of Software Construction ● Algorithms

2010–2015
Portland State University, *Portland, OR*, GPA - 4.0/4.0
Credit courses: ● Digital Systems ● Digital Design Using HDLs ● Intelligent Robotics I&II ● Quantum Computing

Research

Sep 2018 – Present
Energy-Efficient Multimedia Systems Group, *MIT RLE*, Cambridge, MA
Masters research project: low power depth map estimation of time-of-flight cameras for augmented reality
● Implemented AR pipeline using estimated depth map with OpenGl, OpenCV, Open3D, and ORB-SLAM2
● In progress work: Verilog implementation of estimation algorithm with 3D reconstruction on Xilinx Zynq board

Oct 2016 – May 2018
Tangible Media Group, *MIT Media Lab*, Cambridge, MA
(2018) Undergraduate research project: Dynamic Soundscape for Physical Movement
● Developed system that measured physical movement with IMU and ToF ranging sensor on embedded system, and generated sound after recieving data via bluetooth using an iOS backend
(2017) Undergraduate research project: Sonic Prototyping Tool for Adaptable Sensation Feedback
● Developed mobile device prototype that distorts sounds from physical actions using Raspberry Pi
● Implemented audio processing for sound distorting using the Synthesis ToolKit

Experience

Jun 2019 – Sep 2019
Airbnb, *Trust Account Integrity Team*, San Francisco, CA, Software Intern
● Productionized framework for tracking recent risk trends in account takeovers to prevent future attacks
● Created distributed system for tracking risk trends and compromised passwords

Jun 2018 – Aug 2018
Airbnb, *Guest Growth Discovery Team*, San Francisco, CA, Software Intern
● Developed distributed system for tracking search results including databases, crawlers, and visualizations

Jan 2018 – Feb 2018
Twitch, *Video Transcoder Group*, San Francisco, CA, Software Intern
● Analyzed automated closed captioning techniques for livestreams

May 2016 – Aug 2016
MIT Lincoln Laboratory, Lexington, MA, Research Intern
● Implemented embedded design for DARPA modular radio project

Feb 2016 – May 2016
MIT, *Department of EECS*, Cambridge, MA, Introduction to EECS (6.01) Student Lab Assistant
● Collaborated with course instructors to modify and improve labs; assisted other students with labs

Publications

Sep 2019
James Noraky, Charles Mathy, Alan Cheng, Vivienne Sze, "*Low Power Adaptive Time-of-Flight Imaging for Multiple Rigid Objects*," IEEE ICIP 2019

May 2019
Daniel Levine, Alan Cheng, David Olaleye, et al., "*AUFLIP - An Auditory Feedback System Towards Implicit Learning of Advanced Motor Skills*," CHI 2019 Late-Breaking Work

May 2013
Alan Cheng, Edison Tsai, Marek Perkowski, "*Methodology to Create Hardware Oracles for Solving Constraint Satisfaction Problems*," 22nd International Workshop on Post-Binary ULSI Systems

Activities / Side Projects

Jan 2017
Battlecode 2017 Competition, *MIT*, Cambridge, MA
Team leader; software developer
● Finalist: 13th place team out of 374 total teams

Sep 2016
HackMIT 2016 Project: SplitPay, *Rough Draft Ventures Prize*
● Created webapp that scans receipts and automatically splits charges to others
● Implemented image processing algorithm with OpenCV to binarize and deskew color image to make OCR more accurate

Nov 2016
YHack 2016 Project: SentiBoard, *Corsair API Prize - 1st Place*, Team Leader
● Created app to change keyboard backlighting based-off the user's written and facial expressions.
● Implemented image processing algorithm with OpenCV to recognize emotion in camera livestream
● Helped implement sentiment recognition in text with NLP using NLTK

Skills

○ Digital Design	○ Embedded Systems	○ Verilog	○ Python
○ FPGA	○ Computer Vision	○ C/C++	○ Java