Yu-Chi Lin

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EDUCATION

University of California, Berkeley August 2021 – present

- Ph.D., Electrical Engineering and Computer Sciences (EECS)
- Advisor: Prof. Ali M. Niknejad, Prof. Kristofer S. J. Pister
- Research Interests: mixed-signal IC, biomedical sensor, system-on-chip (SoC), mm-Wave IC
- Affiliations: Berkeley Wireless Research Center (BWRC), Berkeley Sensor & Actuator Center (BSAC)

National Tsing Hua University, Hsinchu, Taiwan September 2017 – June 2021

- B.S., Electrical Engineering (EE) GPA: **4.23/4.3** (**rank 1/102**)

RESEARCH EXPERIENCE & PROJECT

Low Power Wireless EEG December 2021 – present

Prof. Ali M. Niknejad, Prof. Kristofer S. J. Pister, EECS, UC Berkeley

- Designing wireless EEG for TMS-EEG-fMRI system [NIH R01MH127104]
- Designing μV precision ADC for SCμM-V (single-chip micro mote) with Intel 16nm finFET process
- Built prototype with off-shelf ADC (ADS1299) and SCμM via serial peripheral interface (SPI)

DAC-driven Transimpedance Amplifier January 2022 – May 2022

- Designed fully differential 300Ω-loaded transimpedance amplifier with TSMC 28nm CMOS process
- Achieved 250Ω gain, 70dB loop gain, 9.77-bit ENOB, 700MHz BW, 4.98mW power, 4.95ns settling, and 53.7μV output noise, with 1V supply and 50μA reference current
- Stabilized CMFB between class AB output stage and folded-cascode first stage

38-mm Smartwatch Liquid-Crystal Display Driver August 2021 – December 2021

- Drove 272×340 pixels, with 1.4V light-to-dark full swing transition, sequentially at 60Hz refresh rate
- Built 2-stage op-amp with GDPK 45nm CMOS process, 1.8V and 1V power supplies, telescopic-cascode, class AB amplifier, Miller compensation, and single biasing current source

RISC-V CPU Processor August 2021 – December 2021

- Implemented RISC-V ISA with 3-stage pipelined CPU, cache memory, and control status register (CSR)
- Designed configurable direct-mapped and 2-way set associative cache with write-back and -through policies
- Front-end Verilog design and simulation, and back-end synthesis and PAR with ASAP7 7nm process

Terahertz (THz) None-line-of-sight (NLOS) Imaging February 2020 – June 2021

Prof. Shang-Hua Yang, Yang Research Group, EE, NTHU

- Submitted proposal to **Ministry of Science and Technology (MOST)**, Taiwan
- Asynchronous optical sampling (ASOPS) Terahertz time-domain spectroscopy (THz-TDS) system

IC Lab QR Code Decoder September 2020 – January 2021

- Decoded rotated 25×25 QR code within 64×64 random-background bitmap images into URL web address
- Ranked A and won second-place in synthesis contest (over half of classmates are graduate students) (performance index (PI) is defined as the product of total area, timing constrain, and total simulation cycles)

ASCII and utf-8 Files Encoding February 2020 – June 2020

- Achieved 70% fewer storage space for utf-8 text files with Huffman encoding scheme

MOS Fabrication February 2020 – June 2020

- Fabricated MOS from silicon wafer in Tsing Hua Lab (Class 1000, The Federal Standard 209E), highest-class cleanroom in Taiwan's academia
- Characterized MOS with carrier mobility and threshold voltage through two-probe measurement

Terahertz Curvature Sensing System June 2019 – January 2020

- Undergraduate Project Oral and Poster Presentation Competition (**rank 1/53**), EE, NTHU
- Characterized surface roughness based on THz continuous wave scattering

Full-Custom Eight Frequency Mode Clock Generator September 2019 – January 2020

- Built full-custom eight frequency mode clock divider with 0.18μm CMOS process, with three-bit half-adders, double-edged-triggered flip-flops, and True Single Phase Clock (TSPC)
- Achieved maximum operating frequency of 530MHz, at TT (25ºC) corner, with 1.91mW power
- Won the performance competition with the smallest layout area consumption

Logic Design Puzzle Tetris Game January 2018 - June 2018

- Established Tetris and innovative jigsaw puzzle in Verilog HDL with Xilinx Vivado on FPGA board
- Integrated with counter, timer, keyboard, speaker, LCD, LED

TECHNICAL SKILLS

Analog Circuit Design

- Cadence, ADS, Hspice, Laker, Composer
- Integrated Circuits for Communications (EE242A) (A-)
- Analog Integrated Circuits (EE 240A) (A), Advanced Analog Integrated Circuits (EE240B) (A-)

Digital Circuit Design

- Verilog hardware description language (HDL), logic synthesis, logic equivalence checking, layout place and route, FPGA and ASIC design and implementation
- Introduction to Digital Design and Integrated Circuits (EECS 251A) (A+)
- Introduction to Digital Design and Integrated Circuits Lab (EECS 251LA) (A)
- Logic Design Lab (A+), IC Design Lab (A+)

Cleanroom Fabrication

- MOS silicon wafer fabrication
- Introduction to Solid-State Electronics Device (A+)
- Solid-state Electronics Laboratory-Semiconductor Processing (A+)

Optical System

- Terahertz (THz) photonics and applications
- Frequency-domain and time-domain THz spectroscopy, THz tomography

Biomedical Engineering

- Homunculus Man modelling, Ultrasound and MRI imaging simulation
- Psychology and Modern Life (A+), Life Science (A), Introduction to Biomedical Imaging (A)

Software Programming

- C (advanced), C++, Matlab, Python, Linux OS
- Algorithms (A+), Data Structures (A+)

SELECTED AWARDS & HONORS

ISSCC Student Travel Grant Award (STGA) February 2022

IEEE SSCS Next Generation Circuit Designer February 2022

Taiwan-UC Berkeley Fellowships August 2021
- **top 5 UC Berkeley PhD students from Taiwan**

Dr. I-Chi Mei Memorial Medal June 2021
- NTHU graduate with the highest distinction (**7 out of 2000** in the class of 2021)

Scholarship of the Outstanding Student in Engineering, Chinese Institute of Engineers June 2021
- only recipient from NTHU, highest prestigious award to **top 10 senior undergraduates in Taiwan**

The Memorial Scholarship to Mr. Lin Hsiung Chen November 2020
- largest scale scholarship awarded to **top 50 college students in Taiwan**

Shun-I Chu and Zyxel Scholarship (**top 15 third-year students in NTHU**) June 2020

Presidential Award (**top 2% in class**), NTHU March / October 2018, October 2019, March 2020, October 2021

Broke Games Record in 800M race, sports day, NTHU November 2019

Overseas Exchange Scholarship, EE, NTHU July 2019
- Summer Session, **University of California, Berkeley,** CA, US

TEACHING EXPERIENCE

EE231002 Introduction to Programming September 2020 – January 2021
Prof. Mi-Chang Chang, EE, NTHU
- In-class computer lab tutorial for over 100 electrical engineering freshmen

EECS206001 Discrete Mathematics September 2019 – January 2021
Prof. Wing-Kai Hon, Department of Computer Science (CS), NTHU
- Exams and assignments tutorial for over 250 students from different disciplines in English

SELECTED EXTRACURRICULAR & LEADERSHIP

Member, New Student Committee, August 2022 – present
Graduate Women of Engineering (GWE), UC Berkeley

Peer Advisor, Visit Days, EECS, UC Berkeley February 2022

Member, **Track and Field school team**, NTHU October 2018 – June 2021

Member, International Sports Affair Training course program, April 2019 – June 2021
Sports Administration of Ministry of Education and Chinese Taipei Olympic Committee

Member, Leadership in Service Program, Office of Student Affairs, NTHU August 2019 – June 2021

School Representative, April 2019, November 2020
National Intercollegiate Athletic Games, Chinese Taipei University Sports Federation

Staff, Late Night Movie Theater, Arts Center, NTHU January 2018 - June 2019

Member, Female College Students Leadership Program, Ministry of Education, Taiwan August 2018