SINONG(SIMON) ZHAN

Github: https://github.com/SimonZhan-code◇ Personal Page: https://simonzhan.github.io/

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EDUCATION

University of California, Berkeley   *August 2018 - Present*
Major in Computer Science and Applied Mathematics(Statistic cluster); **Major GPA:**3.782
High School Affiliated to Renmin University of China   *Sep 2015 - Jun 2018*
IGCSE/AL program; **GPA:4.0** (Valedictorian speaker)

PRESENTATION

- **RElectrode: A Reconfigurable Electrode For Multi-Purpose Sensing Based on Microfluidics**. Poster session of *ACM CHI 2021*.

RESEARCH EXPERIENCE

Human Computing Lab, ISCAS and XDiscovery Lab, Dartmouth College May 2019-Now
Researcher   *Advised by Prof Feng Tian & Prof Teng Han & Prof Xingdong Yang*

- Explored the field of new fabrication and novel interaction
- Researched on microfluidics and photovoltaic technology's application in HCI field
- Explored properties of 3D printing materials and design 3D printing model
- Learnt how to explore and design user design space for various usage scenarios
- Learnt to design user experiments to test robustness and feasibility
- Explored various sensing technologies and built different sensing devices

State Key Lab, Institute of Software in CAS(ISCAS)   Dec 2020-Now
Software developer   *Advised by Prof Bohua Zhan and Prof Naijun Zhan*

- Developed a toolchain on modeling, simulation, and verification for complex cyber-physical systems(MARS)
- Self-learnt basics of Embedded system and modeled text-book cases by Simulink
- Participated in building an automatic translation tool from the Simulink to HCSP (Hybrid CSP) and a theorem prover for HHL (Hybrid Hoare Logic Prover)
- Created comprehensive testing cases for system verification tools

PUBLICATION

LightSticker: Enabling Pervasive Light Emission Detection for Smart IoT Applications
Simon Zhan, Chutian Jiang, Wei Sun, Jiaxuan Ren, Teng Han, Feng Tian, Xing-Dong Yang.(Advised by Bjoern Hartmann). **In preparation** to ACM Symposium on User Interface Software and Technology 2022(*UIST 2022*).

MicroFluID - A Reconfigurable RFID Platform for Robust Interaction Sensing Based on Microfluidics Wei Sun, Yanjun Chen, Simon Zhan, Teng Han, Feng Tian, Hongan Wang, Xing-Dong Yang. **In revision** to ACM Conference on Human Factors in Computing Systems 2022(*CHI 2022*).

RElectrode: A Reconfigurable Electrode For Multi-Purpose Sensing Based on Microfluidics. Wei Sun, Yanjun Chen, Simon Zhan, Teng Han, Feng Tian, Hongan Wang, Xing-Dong Yang. **Accepted** by ACM Conference on Human Factors in Computing Systems 2021 (*CHI 2021*)
link: https://doi.org/10.1145/3411764.3445652

PROJECTS

LightSticker
Photovoltaic Tech/Novel design/New fabrication/ IoT

CHI/UIST 2022(First Author)   *Video*

· Investigated photovoltaic materials and wearable photovoltaic devices industry
· Explored user design space on legacy devices and divide into different categories
· Implemented signal processing and ML algorithms for pattern recognition
· Participated in back-end circuit(Amplifier, Multiplexer, and ADC) design using Labjack board
· Designed the structure of the sticker(electrode used on sticker)
· Designed and conduct evaluation experiments to test robustness and feasibility

MicroFluID
RFID/Microfluidics/Antena design

CHI 2022(Major Contributor)   *Video*

· Designed the RFID antenna supporting multiple chips identification within a single tag
· Fabricated the RFID antenna on PET substrate using silk-net printing technique
· Designed microfluidics structures that enable different different identification modes
· Designed and conduct evaluation tests on RFID tag's durability, robustness, and functionality

MARS
Python/Simulink/HTML

Participant   *Github*

· Developed blocks feature of simulation tool in MARS system same as blocks in Simulink.
· Conducted testing on existing features on simulatin tool and automatic translation tool.
· Formulated demonstration of MARS system using textbook example such as Feedback system, etc.
· Developed both online and local GUI for graphing system using python Tkinter, flask, and HTML

RElectrode
Novel Sensing/Fabrication/Microfluidics

CHI 2021(Major Contributor)   *Video*

· Researched on possible materials for re-configurable soft channel(PDMS, Ecoflex, etc)
· Designed re-configurable patterns of microfludics chip capable of detecting various signals
· Devised driving unit and valve logic which enables liquids switching and channels cleaning
· Conducted user experiments for object detection and gesture identification
· Analyzed the identification accuracy based on data from experiments with soft-margin SVM

Get a Grip
SteamVR/Unity3D/C#

CHI 2020 Best Paper Honorable Mention(Participant)   *Video*

· Designed and fabricate the pen model with 3D printing technologies
· Implemented button events on a pen model using bluetooth module for transmission
· Tracked pen movements using OptiTrack V120:Trio and OptiTrack Motive software (Spec detail)
· Mapped pen motions into VR environment using HTC Vive, SteamVR API, and Unity3D
· Reflected button event on pen as SELECT in VR environment
· Constructed a VR environment for experiment use in Unity3D

Geocentric
Dynamic System/ Sensors fusion and network/ Simulation

Group Project   *Github*

· Constructed robot cars to symbolize different planets such as Moon and Earth
· Implemented BLE controller on mother planet to control its trajectory
· Formulate Dynamic System equation for orbiting movement
· Simulated the dynamic system as mother planet moves in arbitrarily trajectory in Simulink
· Designed and built sensors network using IR and EO(electrical optic) sensors on Berkeley Buckler

EMG(electromyography) controlled vehicle   Arduino Uno/C++
Individual project   *Github*

· Collected EMG data through Myo armband and analyze the EMG signal based on FFT algorithm.
· Constructed the vehicle and bluetooth module based on Arduino Uno board.
· Implemented instruction sets on vehicle using Myo built-in API and bluetooth module for transmission.
· Collected testing data and train SVM model based on LIBSVM in C++.

PATENT

No.CN201710953534.X **The Device generating control instruction for multi-targets based on EMG(electromyography) signal** Simon Zhan, Junjun Fan, Feng Tian, Wei Sun. *Protected by Patent Law of the People's Republic of China*

No.CN202110377915.4 **A complex microfluidic pipeline composite structure and microfluidic pattern deformation system based on microfluidic technology** Wei Sun, Yanjun Chen, Simon Zhan, Teng Han, Feng Tian, Hongan Wang, Xing-Dong Yang. *Protected by Patent Law of the People's Republic of China*

No.CN202110378536.7 **A fluid pattern re-configurable system based on microfluidic technology** Wei Sun, Yanjun Chen, Simon Zhan, Teng Han, Feng Tian, Hongan Wang, Xing-Dong Yang. *Protected by Patent Law of the People's Republic of China*

TECHNICAL STRENGTHS

Computer Languages	C/C++, Python, Java, R, C#, RISC-V, MATLAB, Julia
Software & Tools	HTML, Excel, Mathematica, Unity3D, Simulink, LaTeX, Autodesk Fusion360
Language	Academic proficiency in Chinese and English, Limited proficiency in German

TECHNICAL COURSES WORK(TAKING/TAKEN)

1. Linear Algebra(Math110)
2. Abstract Algebra(Math113)
3. Numerical Analysis(Math128A)
4. Optimization Models(EECS127/227A)
5. Probability theory(Stat134)
6. Statistical methods(Stat135)
7. Efficient Algorithm(CS170)
8. Database(CS W186)
9. Real Analysis(Math104)
10. Neural Network(CS182/282A)
11. Machine Learning(CS189/289A)
12. Embedded System(EECS149/249A)
13. Complex Analysis(Math185)
14. Time Series(Stat153)
15. Partial Differential Equation(Math 126)
16. Nonlinear System(EE C222)

HOBBIES

I like playing guitar and poker in my part time, intending to become a part time poker player. I also enjoy all kinds of sports and routinely working out. Besides, I love reading and writing book recommendation and comments while reading.