

# Qiuyue(Shirley) Xue

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## Education

### University of Washington

Ph.D, Computer Science and Engineering

Sep.2019 - present

Advisor: Shwetak Patel

### Georgia Institute of Technology

M.S, Computer Science and Technology

Aug.2017 - May.2019

Advisor: Gregory Abowd, Thad Starner

### Peking University, China

B.S., Computer Science and Technology

Sep.2013 - Jul.2017

B.S., Microelectronics Science and Engineering

Advisor: Chenren Xu

## Research

### Airdropping Sensor Networks from Drones and Insects[link]

Sep. 2019 - Mar. 2020

NETWORK & MOBILE SYSTEMS LAB, UNIVERSITY OF WASHINGTON

Advised by Prof. Shyam Gollakota

- Designed a [light and low-power airdropping sensor platform at insect-scale](#) with [communication](#), [self-releasing](#), and [localization](#) capabilities
- Developed [long range\(up to 1km\)](#) low power bluetooth communication on commercial BLE chips by [reverse engineering Bluetooth protocol](#).
- Developed [localization](#) of insect-scale airdropping system based on [Angle of Arrival\(AoA\)](#).

### Ubiquitous Self Sustaining Ubiquitous Touch Interfaces[link]

Nov. 2018 - Nov. 2019

UBICOMP LAB, GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Gregory Abowd and Prof. Thad Starner

- Developing a [battery-free, low-cost, printable, wireless touch interface](#) with ambient energy harvesting and backscatter communication
- Designed [ambient FM backscatter](#) communication that is [compatible with smartphones](#)
- Developed the [ambient light energy harvesting and management](#) circuit

### BrainBaille: Towards Mobile Brain Computer Interface

Sep. 2018 - May. 2019

CONTEXTUAL COMPUTING GROUP, GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Thad Starner

- Using [fNIRS\(functional Near-Infrared Spectroscopy\)](#) based system to detect brain signal pattern, to enable [activity recognition](#) and [silent communication\(Braille\)](#)
- Using [fMRI](#) and [fNIR](#) system to examine which portions of the brain are best suitable for sensing communicative signals using a portable fNIR system

### Zero Energy Ubiquitous Sound Sensing Surface (ZEUSSS)[link]

Mar. 2018 - May. 2019

UBICOMP LAB, GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Gregory Abowd and Prof. Thad Starner

- Developed a [flexible self-sustained](#) system that has [acoustic sensing](#) and [wireless communication](#) capability [without consuming any power](#)
- Developed [analog backscatter](#) to enable wireless communication without power consumption
- Integrated analog backscatter to [Triboelectric Nanogenerator\(TENG\)](#) based sound sensing surface

### Anti-plagiarism Agent detecting Homework-for-hire[link]

Jan. 2018 - Jan. 2019

CONTEXTUAL COMPUTING GROUP, GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Thad Starner

- Developed an [artificial intelligence agent](#) which will detect and combat the “homework for hire” based plagiarism
- Developed an [IBM Watson based chat-bot](#) to interact with cheating students automatically and send them water-marked solutions

### FingerPing: Recognizing fine-grained hand poses using active acoustic on-body sensing[link]

Mar. 2017 - Sep. 2017

UBICOMP LAB, GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Gregory Abowd

- Developed the theory that different hand poses create unique acoustic frequency response which can be classified by machine learning techniques
- Implemented the [signal processing and feature extraction](#) for the [machine learning classification](#)
- Designed the cutting edge user interaction methods for wearable devices(smart watches, etc.), conducted the [system evaluation and user study](#)

### TV-Backscatter: Enabling ubiquitous ultra-low power communication [link]

Dec. 2016 - Jun. 2017

CENTER FOR ENERGY-EFFICIENT COMPUTING AND APPLICATIONS, PEKING UNIVERSITY

Advised by Prof. Chenren Xu

- Led the project and developed the theory that the coin-size tag can communicate by reflecting ambient TV signals consuming only micro-watts power
- Implemented the backscatter system by [FPGA](#) and receiver decoding system based on [GNU Radio](#)
- Evaluated the system and developed two [IoT \(Internet of Things\)](#), [RT/Embedded System](#) applications

### Bioacoustics-based human body mediated communication[link]

Sep. 2016 - Nov. 2016

UBICOMP LAB, GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Gregory Abowd

- Utilized the human body as a communication channel to enable [natural human-device interactions](#) and secure personal area network.
- Implemented the communicating part to encode and decode the signal by [frequency-Shift keying\(FSK\)](#).

### SoundTrak: Continuous 3D tracking of a finger using active acoustics[link]

Jul. 2016 - Nov. 2016

UBICOMP LAB, GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Gregory Abowd

- Developed the physics model of computing the received signals' phase to continuously track speaker (user finger) and geometric model of 3D tracking
- Developed the [signal processing](#) and the [tracking algorithm](#)
- [Designed the user interaction methods](#): gesture control, text input, drawing and 3D input for wearable devices (smart watches, Google glasses, etc.)

## Experience

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### Google Health Research and Innovation

STUDENT RESEARCHER AND SOFTWARE ENGINEER

- Research and development on health sensing and daily health tracking using mobile sensors.

Jun. 2020 - present

Mentored by D. Shin, Mark Malhotra

### Bloomberg L.P. Machine Learning Text Analysis Team

MACHINE LEARNING SOFTWARE ENGINEER

- Conducted [sentiment analysis](#) on earnings call transcript data based on [Supervised Machine Learning](#) and [Natural Language Processing](#)
- Developed a novel [time series processing](#) method to label the earnings call sentiment by price data

May. 2018 - Jul. 2018

Mentored by Karan Uppal, Temma Choji, Vika Abrecht

## Publications

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### Airdropping Sensor Networks from Drones and Insects [\[link\]](#)

QIUYUE XUE\*, VIKRAM IYER\*, MARUCHI KIM\*, ANRAN WANG, SHYAM GOLLAKOTA

ACM Mobicom

2020

### UbiquiTouch: Self Sustaining Ubiquitous Touch Interfaces [\[link\]](#)

ANANDGHAN WAGHMARE, QIUYUE XUE, DINGTIAN ZHANG, YUHUI ZHAO, SHIVAN MITTAL, NIVEDITA ARORA, CEARA BYRNE, THAD E. STARNER, GREGORY D. ABOWD

ACM IMMUT

2020

### Jack Watson: Addressing Contract Cheating at Scale in Online Computer Science Education [\[link\]](#)

ROCKO GRAZIANO, DAVID BENTON, SARTHAK WAHAL, QIUYUE XUE, P. TIM MILLER, NICK LARSEN, DIEGO VACANTI, PEPPER MILLER, KHUSHHALL CHANDRA MAHAJAN, DEEPAK SRIKANTH, THAD STARNER

ACM Learning @ Scale

2019

### FingerPing: Recognizing fine-grained hand poses using active acoustic on-body sensing [\[link\]](#)

CHENG ZHANG, QIUYUE XUE, ANANDGHAN WAGHMARE, RUICHENG MENG, SUMEET JAIN, YIZENG HAN, XINYU LI, KENNETH CUNEFARE, THOMAS PLOETZ, THAD STARNER, OMER INAN, GREGORY ABOWD

ACM CHI

2018

### SoundTrak: Continuous 3D tracking of a finger using active acoustics [\[link\]](#)

CHENG ZHANG, QIUYUE XUE, ANANDGHAN WAGHMARE, SUMEET JAIN, YIMING PU, JORDAN CONANT, SINAN HERSEK, KENT LYONS, KENNETH CUNEFARE, OMER INAN, GREGORY ABOWD

ACM IMMUT

2017

### Bioacoustics-based human body mediated communication [\[link\]](#)

CHENG ZHANG, SINAN HERSEK, YIMING PU; DANRUI SUN, QIUYUE XUE, THAD STARNER, GREGORY ABOWD, OMER INAN

IEEE Computer

2017

## Patents

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### Systems, Methods and Devices for Gesture Recognition [\[link\]](#)

CHENG ZHANG, QIUYUE XUE, ANANDGHAN WAGHMARE, SUMEET JAIN, YIMING PU, KENNETH CUNEFARE, OMER INAN, GREGORY ABOWD

WO 2019/051082 A1

2019

### A thin and flexible self-powered vibration transducer employing triboelectric nanogeneration [\[link\]](#)

NIVEDITA ARORA, DIEGO OSORIO, QIUYUE XUE, DHARVA BANSAL, PETER MCAUGHAN, SEYEDEH FERESHTEH SHAHMIRI, STEVEN L. ZHANG, MOHIT GUPTA, YI-CHENG WANG, ZHENGJUN WANG, ZHONG LIN WANG, THAD E. STARNER, GREGORY D. ABOWD

US 2019/0373375 A1

2019

## Skills

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### Programming

Python, Java, C/C++, Matlab, VHDL

### Strengths

Machine Learning, Digital Signal Processing, Artificial Intelligence, Hardware Prototyping, Acoustic, Sensors, Analog/Digital Circuit, PCB, Internet of Things, Applied Physics

## Academic Services

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**Paper Reviewer** UIST'19, ICMI'19, IMMUT'18, CHI'18

**Teaching Assistant** Georgia Tech CS6601 Artificial Intelligence 2019 Spring

**Student Volunteer** Ubicomp'17

## Awards

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2019 **Best Poster Award**, ACM MobiSys'19

2015 **Academic Excellence Awards**, Peking University

2012 **First class prize**, Physics Olympiad in China

2012 **Second class prize**, Mathematics Olympiad in China

[China](#)

[China](#)

[China](#)