

# Youchao Wang

Department of Engineering, University of Cambridge

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## Education

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### Ph.D. in Engineering

- Electrical Engineering Division, Department of Engineering.

University of Cambridge, UK, 2019 – present

### M.Phil. in Engineering (By Research)

- Electrical Engineering Division, Department of Engineering.

University of Cambridge, UK, 2018 – 2019

### B.Eng. Electronic Engineering (1<sup>st</sup> Class Honours)

- Second year direct entry. Final grade: 87%. Third year rank: 3/250. Second year rank: 1/240.

University of Manchester, UK, 2016 – 2018

### B.Eng. Electrical Engineering and its Automation

- First and Second year final result: 83%. First year rank: 2/119.

North China Electric Power University, China, 2014 – 2018

### High School Graduate

Tsinghua High School, China, 2011 – 2014

## Work Experience

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### Research Assistant

Department of Engineering, University of Cambridge, UK

Jan. 2019 – Mar. 2019

- Supervisor: Dr. Phillip Stanley-Marbell
- Embedded system circuit design and embedded system software development. Part time.

### Research Assistant

Department of Engineering, University of Cambridge, UK

Aug. 2018 – Sep. 2018

- Supervisor: Dr. Phillip Stanley-Marbell
- Research topic: Deriving physically-inspired sensor signal invariants using a physics specification language
- Compiler Construction, Programming language design, Signal and Noise, Dimensional analysis, Physically-inspired high-level description language (*Newton*).

### Research Assistant

School of Electrical and Electronic Engineering, University of Manchester, UK

Jul. 2017 – Sep. 2017

- Supervisors: Prof. Bruce Grieve in collaboration with Prof. Christopher Collins at University of Reading
- Research topic: “Internet of Things” LoRaWAN Sensor System for Protecting Rivers and Watercourses
- Internet of Things (IoT) in e-Agri, Hardware design, PCB design, Firmware design and implementation, Wireless communication.

### Paid personal tutor

Hanban Foreign Learning Programme, North China Electric Power University, China

Jul. 2016 – Aug. 2016

- Paid one-on-one tutoring in the form of reading, writing and speaking (Chinese and English).

## Project Portfolio

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### HoloDeck – Investigating Multiple Spatial Light Modulators Systems

2019 – present

- Ph.D. Degree Research Project, Supervisor: Prof. Tim Wilkinson
- Focus: Computer generated holograms, Spatial light modulators, PCB design, Algorithm implementation, Optical Information Processing, Deep Neural Networks.

### Interfacing a High Speed Ferroelectric Spatial Light Modulator

2019 – present

- Research Side-Project, Supervisor: Prof. Tim Wilkinson
- Focus: Spatial light modulator, Computer generated holograms, PCB hardware design, FPGA firmware implementation.

### Computer Generated Holography on a Digital Signal Processor System

2019 – 2019

- M.Phil. Degree Research Project, Supervisor: Prof. Tim Wilkinson
- Focus: Computer generated holograms, Digital signal processing, Algorithm implementation.
- Published a first-author conference paper focusing on the implementation of a fast hologram generation algorithm on a multi-core digital signal processor.

- Sensor Data Fusion using Automated Dimensional Function Synthesis** 2018 – 2019
- M.Phil. Degree Research Project, Supervisor: Dr. Phillip Stanley-Marbell
  - Focus: Miniature hardware system design, Firmware implementation, Physics specification language compiler design.
  - Published a first-author conference and journal double-track paper focusing on the implementation of a dimensional function synthesis compiler.

- “IoT” Water Quality Monitoring System for Protecting Rivers and Watercourses** 2017 – 2018
- B.Eng. Degree Individual Project, Supervisor: Prof. Bruce Grieve
  - Focus: Low-cost turbidity sensor design, Low power system design, Encoding and decoding to enhance the data transmission efficiency
  - Published a first-author journal paper focusing on the design of a low-cost turbidity sensor.

- Embedded System Project Team Competition (3<sup>rd</sup> Rank Among 48 Groups)** 2016 – 2017
- Second-year Team Project: Line-following robotic buggy using light-sensitive sensor array and ultrasound sensor.
  - A major contributor to hardware design and software implementation, including buggy structural design, line-detection application, motor control and programming.
  - Leading role in team organisation (team of 4).
  - 90/100 personal project overall score.

## Position of Responsibility

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- Electronic Engineering Third Year Student Representative** 2017 – 2018
- Electrical and Electronic Engineering Second Year Student Representative** 2016 – 2017
- Chairman of NCEPU International Education School Students’ Union** 2014 – 2015
- Chairman of Tsinghua High School Students’ Union** 2012 – 2013
- Chairman and General Secretary of Tsinghua High School Model United Nations** 2012 – 2013

## Selected Honours and Awards

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- CSC Cambridge Scholarship (Fully-funded PhD)** Jun. 2019
- CSC Masters Programme Scholarship (Partially-funded MPhil)** Jun. 2018
- Third Year 3<sup>rd</sup> Prize in School of EEE, UoM (Top 3)** Jun. 2018
- 2018 Beijing Outstanding Higher Education Graduate Title** Jun. 2018
- Second Year 1<sup>st</sup> Prize in School of EEE, UoM (Top 1)** Oct. 2017
- Beijing Capital University & College “Pioneer Cup” Outstanding Member Title** Oct. 2016
- 3<sup>rd</sup> Prize Student Scholarship at NCEPU** Sep. 2016
- Entrepreneur Student Scholarship (Top 3) at NCEPU** Dec. 2015
- 1<sup>st</sup> Prize (Top 2) Student Scholarship at NCEPU** Sep. 2015
- Special Award (Top 1‰) in National English Competition for College Students** May. 2015
- 2<sup>nd</sup> prize (Top 10) in 20<sup>th</sup> National English Speaking Competition, Beijing region** Dec. 2014

## Key Skills

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### Subject Related

- Proficient in C programming (Embedded C and compiler design). Proficient in MacOS and Linux (Ubuntu, Scientific Linux, etc.).
- Know well in Verilog and VHDL coding.
- Know well in C++, Python, Java (Eclipse IDE and Android software development), Matlab and Simulink.
- Proficient in MplabX IDE and Code Composer Studio. Know well in Cadence Software (VLSI), Xilinx IDE and Quartus Prime (VHDL and Verilog).
- Proficient in Altium Designer. Know well in Eagle, Designspark, NI Multisim (Circuit and PCB design). Know well in Solidworks and AutoCAD (Product design).
- Proficient in the use of microcontrollers (PIC18 family). Know well in Raspberry Pi.
- Know well in the Cortex M series, TI KeyStone DSPs and Lattice iCE40 FPGAs.

### IT

- Proficient in the use of Adobe Family (Audition, After Effect, Premiere, Photoshop), Microsoft Office Products (Invited talk *How to make PPT better looking* at NCEPU, 2016), Corel VideoStudio, Edius, FinalCut.
- Proficient in the use of  $\LaTeX$  (Invited talk *How to use  $\LaTeX$*  at University of Cambridge, 2019)
- Proficient in Photography, Filmmaking and Video Editing.

## Driving Licence

- Full clean driving licence in China.

## Language

- English (IELTS 8.0/9.0), Chinese (Native Speaker)

## Interests

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Photography, Tennis, Piano, Model United Nations.

## Publication List

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[1] [HARDWARE IMPLEMENTATIONS ON COMPUTER GENERATED HOLOGRAPHY: A REVIEW](#)

**Youchao Wang**, Daoming Dong, Peter Christopher, Andrew Kadis, Ralf Moutaah, Fan Yang and Timothy Wilkinson. *In Submission*, 2019.

[2] [COMPUTER HOLOGRAM GENERATION WITH ONE-STEP PHASE-RETRIEVAL USING A DIGITAL SIGNAL PROCESSOR BOARD](#)

**Youchao Wang**, Daoming Dong, Peter Christopher, Andrew Kadis and Timothy Wilkinson. *Accepted*, 2019.

[3] [LOOKUP TABLES FOR PHASE RANDOMISATION IN HARDWARE GENERATED HOLOGRAMS](#)

Peter Christopher, **Youchao Wang**, Daoming Dong, Andrew Kadis, Ralf Moutaah and Timothy Wilkinson. *In submission*, 2019.

[4] [NOVEL PREDICTIVE SEARCH ALGORITHM FOR PHASE HOLOGRAPHY](#)

Peter Christopher, **Youchao Wang**, and Timothy Wilkinson. *In Submission*, 2019.

[5] [FIXED-POINT ACCURACY ANALYSIS OF 2D FFT FOR THE CREATION OF COMPUTER GENERATED HOLOGRAM](#)

Daoming Dong, **Youchao Wang**, Peter Christopher, Andrew Kadis and Timothy Wilkinson. *Accepted*, 2019.

[6] [EFFICIENT SENSOR DATA FUSION USING AUTOMATED DIMENSIONAL FUNCTION SYNTHESIS](#)

**Youchao Wang**, Sam Willis, Vasileios Tsoutsouras and Phillip Stanley-Marbell. *Accepted*, 2019.

[7] [DISTRIBUTED WATER QUALITY MONITORING SYSTEM USING INTERNET OF THINGS WIRELESS PROTOCOL – LONG RANGE WIDE AREA NETWORK](#)

Shariar Morshed Rajib, **Youchao Wang**, Chris Collins and Bruce Grieve. *In Submission*, 2019.

[8] [SAFEGUARDING SENSOR DEVICE DRIVERS USING PHYSICAL CONSTRAINTS](#)

Gregory Brooks, **Youchao Wang** and Phillip Stanley-Marbell. In *Proceedings of ACM EuroSys 2019* (poster), Dresden, 2019.

[9] [LOW-COST TURBIDITY SENSOR FOR LOW-POWER WIRELESS MONITORING OF FRESH-WATER COURSES](#)

**Youchao Wang**, Shariar Morshed Rajib, Chris Collins and Bruce Grieve. *IEEE Sensors Journal*, Volume: 18, Issue: 11, June 1, 2018. (Officially announced as **one of the 25 most downloaded Sensors Journal** papers in the months of October, November and December 2018, and **the 7<sup>th</sup> most popular document** as of January 2019)

[10] [INTEREST SET MECHANISM TO IMPROVE THE TRANSPORT OF NAMED DATA NETWORKING](#)

Xiaoke Jiang, Jun Bi, **Youchao Wang** and You Wang. In *Proceedings of ACM SIGCOMM13* (poster, Section 12), Hongkong, 2013.

[11] [TECH REPORT: INTEREST SET MECHANISM TO IMPROVE THE TRANSPORT OF NAMED DATA NETWORKING](#)

Xiaoke Jiang, Jun Bi, **Youchao Wang** and You Wang. *Tsinghua University*, 2013.

## Referees

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Available on request