

# Xiaoxuan LU

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RESEARCH INTERESTS	<b>Core:</b> Cyber-Physical Systems, Autonomous Systems <b>Applications:</b> Internet of Things, Mobile Computing, Security and Privacy	
ACADEMIC POSITION	<b>University of Edinburgh, UK</b> School of Informatics, IPAB Assistant Professor (Lecturer), Sep.2020 ~ now  <b>University of Liverpool, UK</b> Department of Computer Science, AI Section Assistant Professor (Lecturer), Feb.2020 ~ Sep.2020  <b>University of Oxford, UK</b> Program Grants (EP/M019918/1) - Mobile Robotics Postdoctoral Researcher, Feb.2019 ~ Feb.2020	
EDUCATION	<b>University of Oxford, UK</b> PhD in Computer Science, 2015 ~ 2019 <ul style="list-style-type: none"><li>- Google-DeepMind PhD Scholarship</li><li>- Thesis: <i>Robustly Inferring Identity across Digital and Physical Spaces</i></li><li>- PhD Committee: Prof. Niki Trigoni (advisor), Dr. Andrew Markham (co-advisor), Dr. Thomas Ploetz and Dr. Nic Lane</li></ul> <b>Nanyang Technological University (NTU), Singapore</b> M.Eng in Electrical and Electronic Engineering, 2013 ~ 2015 <ul style="list-style-type: none"><li>- 1st graduate in the same-year group</li><li>- Thesis: <i>Development of Non-intrusive WiFi Based Indoor Positioning Systems</i></li><li>- Advisor: Prof. Lihua Xie (IEEE Fellow)</li></ul> <b>Nanjing University of Aeronautics and Astronautics (NUAA), P.R. China</b> B.Eng. in Automation Engineering, 2009 ~ 2013 <ul style="list-style-type: none"><li>- Chancellor Gold Medal in Academics</li><li>- Outstanding Graduate Award</li></ul>	
SELECTED AWARDS	Heidelberg Laureate Forum Young Researcher	2020
	Outstanding Overseas Chinese Students Award	2019
	Oxford Junior Research Fellowship	2019
	Best Paper Nominee - DCOSS'19	2019
	Google-Deepmind PhD Scholarship	2015 ~ 2018
	Oxford-Keble Association Study Awards ×3	2016 ~ 2018
	Microsoft Indoor Localization Competition 4th Place Award	2015
	NTU Master of Engineering Award ×3	2013 ~ 2015
	NUAA Chancellor Gold Medal in Academics (1/16000 students)	2012
	CASC Scholarship (2/16000 students)	2012

CATIC Scholarship (7/4000 students)	2011
National Scholarship of China (Top 1%)	2010
Grand Prize of National Electrical Control and Design Contest	2012
Excellent Student Cadre of Jiangsu Province	2012
NUAA First-class Honour Scholarship (Top 2%) ×3	2010-2013

PUBLICATIONS \* indicates the leading student authors are mentored by me.

### Conference Papers:

20. **Xiaoxuan Lu**, Stefano Rosa, Peijun Zhao, Bing Wang, Changhao Chen, John Stankovic, Niki Trigoni and Andrew Markham. "See Through Smoke: Robust Indoor Mapping with Low-cost mmWave Radar" In *ACM Conference on Mobile Systems, Applications, and Services (MobiSys'2020)*.
19. **Xiaoxuan Lu**, Yang Li, Yuanbo Xiangli and Zhengxiong Li. "Nowhere to Hide: Cross-modal Identity Leakage between Biometrics and Devices" In *ACM International World Wide Web Conference (WWW'2020)*.
18. **Xiaoxuan Lu**, Xuan Kan, Bowen Du, Changhao Chen, Hongkai Wen, Andrew Markham, Niki Trigoni and John Stankovic. "Autonomous Learning for Face Recognition in the Wild via Ambient Wireless Cues" In *ACM International World Wide Web Conference (WWW'2019)*.
17. **Xiaoxuan Lu**, Yang Li, Peijun Zhao, Changhao Chen, Linhai Xie, Hongkai Wen, Rui Tan and Niki Trigoni. "Simultaneous Localization and Mapping with Power Network Electromagnetic Field." In *ACM International Conference on Mobile Computing and Networking (MobiCom'2018)*.
16. **Xiaoxuan Lu**, Bowen Du, Hongkai Wen, Sen Wang, Andrew Markham, Ivan Marinovic, Yiran Shen and Niki Trigoni. "Snoopy: Sniffing Your Smartwatch Passwords via Deep Sequence Learning." In *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp'2018)*.
15. **Xiaoxuan Lu**, Bowen Du, Peijun Zhao, Hongkai Wen, Yiran Shen and Niki Trigoni. "DeepAuth: In-situ Authentication for Smartwatches via Deeply Learned Behavioural Biometrics." In *International Symposium on Wearable Computers (ISWC'2018)*.
14. **Xiaoxuan Lu**, Hongkai Wen, Sen Wang, Andrew Markham and Niki Trigoni. "SCAN: Learning Speaker Identity From Noisy Sets of Sensor Data" In *International Conference on Information Processing in Sensor Networks (IPSN'2017)*.
13. **Xiaoxuan Lu**, Chenpu Yu, Han Zou, Hao Jiang, Lihua Xie. "Extreme Learning Machine with Dead Zone and its Application to WiFi Based Indoor Positioning." In *13th International Conference on Control, Automation, Robotics and Vision (ICARCV'2014)*.
12. Peijun Zhao, **Xiaoxuan Lu\***, Bing Wang, Changhao Chen, Linhai Xie, Mengyu Wang, Niki Trigoni and Andrew Markham. "Heart-Rate Sensing With a Robot Mounted mmWave Radar" In *International Conference on Robotics and Automation (ICRA'2020)*.
11. Muhamad Saputra, Pedro Gusmão, **Xiaoxuan Lu**, Yasin Almalioglu and et al. "DeepTIO: A Deep Thermal-Inertial Odometry with Visual Hallucination" In *International Conference on Robotics and Automation (ICRA'2020)*.
10. Bing Wang, Changhao Chen, **Xiaoxuan Lu**, Peijun Zhao, Niki Trigoni and Andrew Markham. "AtLoc: Attention Guided Camera Localization." In *AAAI Conference on Artificial Intelligence (AAAI'2020)*.

9. Changhao Chen, Stefano Rosa, Yishu Miao, **Xiaoxuan Lu**, Wei Wu, Andrew Markham and Niki Trigoni. "Selective Sensor Fusion for Neural Visual Inertial Odometry." In *Conference on Computer Vision and Pattern Recognition (CVPR'2019)*.
8. Changhao Chen, Yishu Miao, **Xiaoxuan Lu**, Linhai Xie, Andrew Markham and Niki Trigoni. "MotionTransformer: Transferring Physical Motion Between Domains For Neural Inertial Tracking." In *AAAI Conference on Artificial Intelligence (AAAI'2019)*.
7. Changhao Chen, **Xiaoxuan Lu**, Andrew Markham and Niki Trigoni. "IONet: Learning to Cure the Curse of Drift in Inertial Odometry." In *AAAI Conference on Artificial Intelligence (AAAI'2018)*.
6. Peijun Zhao, **Xiaoxuan Lu**\*, Jianan Wang, Changhao Chen, Wei Wang, Niki Trigoni and Andrew Markham. "mID: Tracking and Identifying People with Millimeter Wave Radar." In *International Conference on Distributed Computing in Sensor Systems (DCOSS'2019)*. [Best Paper Nominee]
5. Bowen Du, **Xiaoxuan Lu**, Xuan Kan, Kai Wu, Man Luo, Jianfeng Hou, Kai Li, Salil Kanhere, Yiran Shen, Hongkai Wen. "HydraDoctor: Real-time Liquids Intake Monitoring by Collaborative Sensing." In *International Conference on Distributed Computing and Networking (ICDCN'2018)*.
4. **Xiaoxuan Lu**, Hongkai Wen, Han Zou, Hao Jiang, Lihua Xie and Niki Trigoni. "Robust Occupancy Inference with Commodity WiFi." In *International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob'2016)*.
3. Han Zou, Baoqi Huang, **Xiaoxuan Lu**, Hao Jiang and Lihua Xie. "Standardizing Location Fingerprints Across Heterogeneous Mobile Devices for Indoor Localization." In *14th Wireless Communications and Networking Conference (WCNC'2016)*.
2. Han Zou, Yiwen Luo, **Xiaoxuan Lu**, Hao Jiang and Lihua Xie. "A Mutual Information based Online Access Point Selection Strategy for WiFi Indoor Localization." In *11th International Conference on Automation Science and Engineering (CASE'2015)*.
1. Han Zou, Hao Jiang, **Xiaoxuan Lu**, and Lihua Xie. "An Online Sequential Extreme Learning Machine Approach to WiFi Based Indoor Positioning". In *1st World Forum on the Internet of Thing (WF-IoT'14)*.

### Journal Articles:

10. **Xiaoxuan Lu**, Yuanbo Xiangli, Peijun Zhao, Changhao Chen, Niki Trigoni, Andrew Markham. "Autonomous Learning of Speaker Identity and WiFi Geofence from Noisy Sensor Data.", *IEEE Internet of Things Journal*, 2019. (impact factor: 9.515)
9. **Xiaoxuan Lu**, Han Zou, Hongming Zhou, Lihua Xie, Guangbin Huang. "Robust Extreme Learning Machine with Its Application to Indoor Positioning.", *IEEE Transactions on Cybernetics*, 2015. (impact factor: 10.387)
8. Changhao Chen, **Xiaoxuan Lu**\*, Johan Wahlstrom, Andrew Markham and Niki Trigoni. "Deep Neural Network Based Inertial Odometry Using Low-cost Inertial Measurement Units.", *IEEE Transactions on Mobile Computing*, 2020. (impact factor: 4.474)
7. Changhao Chen, Peijun Zhao, **Xiaoxuan Lu**\*, Andrew Markham and Niki Trigoni. "Deep Learning based Pedestrian Inertial Navigation: Methods, Dataset and On-Device Inference.", *IEEE Internet of Things Journal*, 2020. (impact factor: 9.515)

6. Muhamad Saputra, Pedro Gusmão, **Xiaoxuan Lu**, Yasin Almalioglu and et al. "DeepTIO: A Deep Thermal-Inertial Odometry with Visual Hallucination.", IEEE Robotics and Automation Letters, 2020.
5. Hongkai Wen, Ronald Clark, Sen Wang, **Xiaoxuan Lu**, Bowen Du, Wen Hu and Niki Trigoni. "Efficient Indoor Positioning with Visual Experiences via Lifelong Learning.", IEEE Transactions on Mobile Computing, 2018. (**impact factor: 4.474**)
4. Stefano Rosa, Andrea Patanè, **Xiaoxuan Lu**, Niki Trigoni, "Semantic Place Understanding for Human-Robot Cooperation - Towards Intelligent Workplaces", IEEE Transactions on Human-Machine Systems, 2018. (**impact factor: 3.332**)
3. Han Zou, Hao Jiang, Yiwen Luo, Jianjie Zhu, **Xiaoxuan Lu**, Lihua Xie. "BlueDetect: An iBeacon-Enabled Scheme for Accurate and Energy-Efficient Indoor-Outdoor Detection and Seamless Location-Based Service.", Sensors, 16(2), 2016. (**impact factor: 3.031**)
2. Han Zou, Baoqi Huang, **Xiaoxuan Lu**, Hao Jiang and Lihua Xie. "A Robust Indoor Positioning System based on the Procrustes Analysis and Weighted Extreme Learning Machine.", IEEE Transactions on Wireless Communications, 2015. (**impact factor: 6.394**)
1. Han Zou, **Xiaoxuan Lu**, Hao Jiang and Lihua Xie. "A Fast and Precise Indoor Localization Algorithm based on Online Sequential Extreme Learning Machine.", Sensors, 2015. (**impact factor: 3.031**)

#### Demos & Posters:

3. **Xiaoxuan Lu**, Peijun Zhao, Bowen Du, Hongkai Wen, Andrew Markham, Stefano Rosa and Niki Trigoni "Demo: Automatic Face Recognition Adaptation via Ambient Wireless Identifiers" In *International Conference on Embedded Networked Sensor Systems (SenSys'18)*, ACM, 2018.
2. **Xiaoxuan Lu**, Xuan Kan, Stefano Rosa, Bowen Du, Hongkai Wen, Andrew Markham and Niki Trigoni "Poster: Towards Self-supervised Face Labeling via Cross-modality Association." In *International Conference on Embedded Networked Sensor Systems (SenSys'17)*, ACM, 2017.
1. Han Zou, Hao Jiang, **Xiaoxuan Lu** and et al. "Demo: An Accurate and Reliable WiFi-based Indoor Localization and Navigation System." In *the 13th International Conference on Information Processing in Sensor Network (IPSN'15)*, ACM/IEEE, 2015.

#### TEACHING EXPERIENCE

*Embedded Software and Systems*

Role: Course Tutor and Demonstrator

Graduate course, University of Oxford, Department of Computer Science, 2019

*Sensor and Actuator Networks*

Role: Course Co-Designer and Tutor

Graduate/Undergraduate course, University of Oxford, Department of Engineering, 2019

*Internet of Things*

Role: Course Co-Designer and Tutor

Graduate course, University of Oxford, Department of Computer Science, 2018

*Mobile and Sensor Networks*

Role: Co-lecturer and Tutor

Graduate course, University of Oxford, Department of Computer Science, 2017

*Introduction to Programming with Python*

Role: Teaching Assistant

Undergraduate course, Nanyang Technology University, School of Electrical and Electronic Engineering, 2014

## STUDENT MENTORING

- **PhD Students**

- Peijun Zhao, University of Oxford
- Changhao Chen, University of Oxford

- **Master Students**

- Amber Xiangli, University of Oxford (now PhD student at CUHK)
- Yang Li, New York University
- Jialu Wang, University College London

- **Undergraduate Students**

- Zihang Lai, University of Oxford
- Xuan Kan, Tongji University (now PhD student at Emory University)

- **High-school Students**

- Elizaveta Sheremetyeva, Oxford High School GDST

## INVITED TALKS

**Title: Making Cyber Physical Systems Autonomous and Trustworthy**

- University of Edinburgh (March 2020)
- Imperial College London (April 2020)
- University of Glasgow (May 2020)

**Title: Cross-modal Identity Leakage under IoT Richness**

- Human Data Interaction Workshop @ London, UK (February 2020)

**Title: Towards Trustworthy Cyber Physical Systems**

- University of Liverpool (June 2019)
- Cardiff University (June 2019)
- Chinese Academy of Science (August 2019)
- Nanjing University (December 2019)

**Title: Robust Perception for Firefighting in Smoke-Filled Environments**

- JRF Talk @ University of Oxford (May 2019)

**Title: Robustly Inferring Identity across Digital and Physical Worlds**

- University of Cambridge (November 2018)
- Huazhong University of Science and Technology (December 2018)

## PROFESSIONAL SERVICE

- **Technical Program Committee (TPC):**

- 2020: WWW, BuildSys, GPC, Distributed ML @ CoNEXT, CPD @ UbiComp, FAILSAFE @ EWSN
- 2019: MobiSys Ph.D Forum, EWSN Demo/Poster, IMC (Shadow), HAR @ IJCAI, DATA @ SenSys, CMIoT @ UbiComp, DFHS @ BuildSys

- **Organization:**

- 2020: ACM BuildSys - Publicity Co-chair

- 2018: DATA @ SenSys - Session Chair
- **External Conference Reviewer:**
  - 2020: ACM UbiComp, IEEE/ASME AIM
  - 2019: ACM CHI, IJCAI, IEEE ICC
- **Journal Reviewer:**
  - ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
  - IEEE Transactions on Mobile Computing (TMC)
  - IEEE/ACM Transactions on Networking (TON)
  - ACM Transactions on Sensor Networks (TOSN)
  - IEEE Internet of Things Journal (IoT-J)
  - ACM Transactions on Intelligent Systems and Technology
  - ACM Transactions on Computing for Healthcare
  - IEEE Computational Intelligence Magazine
  - IEEE Transactions on Cybernetics
  - Elsevier Neurocomputing
  - Springer Autonomous Robots
  - MDPI Sensors

## REFERENCES

- |  |   |
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| <p><b>Prof. Niki Trigoni</b> (advisor)<br/>Department of Computer Science<br/>University of Oxford</p>                         | <p>Email: niki.trigoni@cs.ox.ac.uk<br/>Oxford, OX1 3PR, UK</p>            |
| <p><b>Dr. Andrew Markham</b> (co-advisor)<br/>Department of Computer Science<br/>University of Oxford</p>                      | <p>Email: andrew.markham@cs.ox.ac.uk<br/>Oxford, OX1 3PR, UK</p>          |
| <p><b>Dr. Nic Lane</b><br/>Department of Computer Science<br/>and Technology<br/>University of Cambridge</p>                   | <p>Email: ndl32@cam.ac.uk<br/>Cambridge, CB3 0FD, UK</p>                  |
| <p><b>Prof. John A. Stankovic</b> (Fellow of ACM &amp; IEEE)<br/>Department of Computer Science<br/>University of Virginia</p> | <p>Email: jas9f@virginia.edu<br/>Charlottesville, Virginia 22904, USA</p> |
| <p><b>Dr. Han Zou</b><br/>Microsoft AI and Research<br/>Microsoft</p>  | <p>Email: hanzou@microsoft.com<br/>Sunnyvale, CA 94089, USA</p>           |
| <p><b>Prof. Lihua Xie</b> (Fellow of IEEE)<br/>School of Electronic Engineering<br/>Nanyang Technological University</p>       | <p>Email: elhxie@ntu.edu.sg<br/>50 Nanyang Avenue, Singapore</p>          |