

Xiaoxuan LU

CONTACT	Department of Computer Science University of Oxford UK OX1 3QD	Email: xiaoxuan.lu@cs.ox.ac.uk Tel: +44 (0) 7421 8 78460 Web: https://christopherlu.github.io/
RESEARCH INTERESTS	Core: Cyber-Physical Systems, Internet of Things Applications: Security and Privacy, Robotics, HCI, Mobile Computing	
CURRENT POSITION	Postdoc Researcher , Cyber Physical Systems Group Department of Computer Science, University of Oxford	
EDUCATION	University of Oxford, UK PhD in Computer Science, 2015 ~ 2019 <ul style="list-style-type: none">- Google-DeepMind PhD Scholarship- Thesis: <i>Robustly Inferring Identity across Digital and Physical Spaces</i>- PhD Committee: Prof. Niki Trigoni (advisor), Dr. Andrew Markham (advisor), Dr. Thomas Ploetz and Dr. Nic Lane- Citation: 447, h-index: 9, 10-index: 9 Nanyang Technological University (NTU), Singapore M.Eng in Electrical and Electronic Engineering, 2013 ~ 2015 <ul style="list-style-type: none">- 1st graduate in the same-year group- Thesis: <i>Development of Non-intrusive WiFi Based Indoor Positioning Systems</i>- Advisor: Prof. Lihua Xie (IEEE Fellow) Nanjing University of Aeronautics and Astronautics (NUAA), P.R. China B.Eng. in Automation Engineering, 2009 ~ 2013 <ul style="list-style-type: none">- Ranked top 1% (2nd out of 203)- Outstanding Graduate Award	
FELLOWSHIPS AND AWARDS	Chinese Government Award for Outstanding Students Abroad Best Paper Nominee - DCOSS'19 Google-Deepmind PhD Scholarship Oxford-Keble Association Study Awards ×3 Microsoft Indoor Localization Competition 4th Place Award Master of Engineering Award of NTU ×3 Outstanding Graduate Award of NUAA NUAA Chancellor Fellowship in Academic Work (1/16000 students) CASC Scholarship (2/16000 students) CATIC Scholarship (7/4000 students) National Scholarship of China (Top 1%) Grand Prize of National Electrical Control and Design Contest Excellent Student Cadre of Jiangsu Province NUAA First-class Honour Scholarship (Top 2%) ×3	2019 2019 2015 ~ 2018 2016 ~ 2018 2015 2013 ~ 2015 2013 2012 2012 2011 2010 2012 2012 2010-2013

TRAVEL	Faith Ivens-Franklin Travel Grant	2018
GRANTS	Student Travel Grant @ Ubicomp	2018
	Student Travel Grant @ SenSys	2017

RESEARCH EXPERIENCE **University of Oxford, UK**
Postdoc Researcher March 2019 ~ present

- *mLaser*: Prototyped a low-cost millimeter wave based mapping and localization system for challenging environments.
- *mID*: Prototyped a non-intrusive millimeter wave based human tracking systems in domestic scenarios. → [DCOSS'19 (Best Paper Nominee)]

Research Student Oct. 2015 ~ Dec. 2018

- *Human Identification across Cyber and Physical Spaces*: Proposed a generic framework that automatically label biometrics in the wild from ambient digital breadcrumbs. → [IPSN'17, IoT-J'19, WWW'19]
- *Cyber-Physical Attacks and Defenses*: Discovered a new threat of motion sensors on smartwatches through deep sequential learning. Proposed a novel cyber-physical countermeasure. → [UbiComp'18, ISWC'18]
- *Multi-modal SLAM*: Identified a new positioning modality of powerline radiations and proposed novel multi-modal fusion methods for autonomous systems. → [MobiCom'18, THMS'18, CVPR'19]
- *Neural Inertial Tracking*: Designed a novel framework of inertial odometry with deep recurrent neural networks to enable drift-less and attachment-agnostic inertial tracking. → [AAAI'18, AAAI'19]

Nanyang Technological University, Singapore
Research Student Aug. 2013 - Jun. 2015

- *Passive Human Localization*: Prototyped a WiFi based non-intrusive human localization systems in smart spaces (**demo**). [TWC'16, TC'16, WiMob'16]

PUBLICATIONS **Conference Papers:**

15. **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)*. Core Rank: A*
14. **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)*. Core Rank: A*
13. **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)*. Core Rank: A*
12. **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)*. Core Rank: A*
11. **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)*, Core Rank: A*

10. 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)*. Core Rank: A*
9. 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)*. Core Rank: A*
8. 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)*. Core Rank: A*
7. 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]
6. **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)*. Core Rank: A
5. **Xiaoxuan Lu**, Bowen Du, 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:

7. **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)
6. **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)
5. Changhao Chen, **Xiaoxuan Lu**, Johan Wahlstrom, Andrew Markham and Niki Trigoni. "Deep Inertial Navigation: a Deep Learning Approach for Inertial Navigation Using Low-cost IMUs.", submitted to *IEEE Transactions on Mobile Computing*, 2018. (impact factor: 4.474)

4. 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**)
3. 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**)
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, 2014. (**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:

4. **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.
3. **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.
2. Stefano Rosa, **Xiaoxuan Lu**, Hongkai Wen and Niki Trigoni. "Poster: Leveraging User Activities and Mobile Robots for Semantic Mapping and User Localization." In *International Conference on Human Robot Interaction (HRI'17)*, ACM/IEEE, 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
Graduate course, University of Oxford, Department of Computer Science, 2019

Introduction of Human Computer Interaction
Gradute/Undergraduate course, ViaX Online Seminar, 2019

Sensor and Actuator Networks
Gradute/Undergraduate course, University of Oxford, Department of Engineering, 2019

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

Mobile and Sensor Networks
Graduate course, University of Oxford, Department of Computer Science, 2017

Introduction to Programming with Python
Undergraduate course, Nanyang Technology University, School of Electrical and Electronic Engineering, 2014

STUDENT
MENTORING

- **Master's Students**
 - Amber Xiangli, University of Oxford (now PhD at CUHK)
- **Undergraduate Students**
 - Xuan Kan, Tongji University (now PhD at Emory University)
 - Yang Li, Tongji University (now Master at NYU)
- **High-school Students**
 - Elizaveta Sheremetyeva, Oxford High School GDST

INVITED
TALKS

Title: Towards Autonomous and Trustworthy Cyber Physical Systems
University of Liverpool (June 2019), Cardiff University (June 2019)

Title: Robust Perception for Firefighting Drones in Smoke-Filled Environments
Christ Church College Talk @ University of Oxford (November 2018)

Title: Robustly Inferring Identity across Digital and Physical Worlds
7th East Lake International Forum for Outstanding Overseas Young Scholars @
Huazhong University of Science and Technology (December 2018)

Title: Autonomous Identity Inference across Cyber and Physical Worlds
Department Seminar Talk @ University of Cambridge (November 2018)

PROFESSIONAL
SERVICE

- **Technical Program Committee (TPC):**
 - ACM IMC 2019 (Shadow PC)
 - International Workshop on Deep Learning for HAR @ IJCAI 2019
 - International Workshop on Data Acquisition to Analysis @ SenSys 2019
 - International Workshop on Multimodal Learning for IoT @ UbiComp 2019
 - International Workshop on Device-Free Human Sensing @ BuildSys 2019
 - Ph.D Forum @ MobiSys 2019
 - ACM EWSN 2019 - Demo/Poster
- **External Conference Reviewer:**
 - ACM UbiComp 2019
 - IJCAI 2019
 - ACM CHI 2019
 - IEEE ICC 2019
- **Journal Reviewer:**
 - IEEE Transactions on Mobile Computing (TMC)
 - ACM Transactions on Sensor Networks (TOSN)
 - IEEE Internet of Things Journal (IoT-J)
 - IEEE Computational Intelligence Magazine
 - IEEE Transactions on Cybernetics
 - Elsevier Neurocomputing
 - Springer Autonomous Robots