

# MENGYUN LIU

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## EDUCATION

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- Doctor of Engineering, Photogrammetry and Remote Sensing** 09/2015 - 06/2019  
Research focus on Indoor Space Cognition and Localization.  
Wuhan University, State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS). **Advisors:** Prof. Deren LI & Prof. Ruizhi CHEN
- Master of Engineering, Photogrammetry and Remote Sensing** 09/2013 - 07/2015  
Research focus on Indoor Localization and Computer Vision.  
Wuhan University, State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS). **Advisors:** Prof. Deren LI & Associate Prof. Haojun AI
- Bachelor of Engineering, Surveying and Mapping Engineering** 09/2009 - 07/2013  
Wuhan University, School of Geodesy and Geomatics (SGG).
- Bachelor of Business Administration (Double Major)** 02/2011 - 07/2013  
Wuhan University, Economics and Management School

## WORK EXPERIENCE

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- Research Associate (02/2022 - Present), Postdoctoral Fellow (06/2020 - 01/2022), CSE | HKUST**  
Working with Prof. Gary CHAN in the Department of Computer Science and Engineering at the Hong Kong University of Science and Technology. Leading the localization team, conducting research and developing systems on ubiquitous indoor localization.
- Research Assistant, LSGI | PolyU** Hong Kong, 10/2019 - 03/2020  
Working with Prof. Xiao-li DING in the Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University. Developed a fusion localization algorithm with multi-antenna GNSS and IMU for vehicle-based mobile mapping.
- Research Intern, Wireless & Networking Group | Microsoft Research** Beijing, 11/2014 - 04/2015  
Working with Dr. Guobin (Jacky) SHEN. Participated in project "Travi-Navi" and developed an Android app on it. "Travi-Navi" is a self-deployable indoor navigation system that can navigate users in an indoor environment without knowing any floorplan information.

## RESEARCH INTERESTS AND SKILLS

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<b>Research Interests</b>	Mobile sensing / Internet-of-Things / Computer vision / Indoor spatial cognition, positioning & navigation, etc.
<b>Programming</b>	Java / Python / C / C++ / MATLAB
<b>Platform / Framework</b>	Android / Ubuntu / PyTorch / TensorFlow / Caffe / OpenCV

## AWARDS

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2021	<b>Top 6%</b> , Microsoft Research Indoor Location and Navigation Competition on Kaggle
2018	<b>Top 10%</b> , Google Code Jam Kickstart Competition, Global Ranking 185/1861
2018	<b>1<sup>st</sup> place</b> , NIST PerfLoc Indoor Positioning Competition Winner
2017	Best Oral Presentation Award of International Graduate Workshops on GeoInformatics
2017	Technology Innovation Award of LIESMARS (50,000 RMB)
2015	Student Scholarship of Collaborative Innovation Center of Geospatial Technology
2012	Guanghua Special Scholarship
2011 & 2012	Outstanding Student & Student Leader
2011	the 3 <sup>rd</sup> Prize of 18 <sup>th</sup> Foreign Translation Competition of Hubei Province
2011	the 2 <sup>nd</sup> Prize of Orienteering Competition of Hubei Province
2010 & 2011	Student Scholarship of Wuhan University

## PROJECTS

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- **HKGov- LandsD: Pilot Project for Ubiquitous Positioning Infrastructure of Hong Kong for Smart City Development** **09/2021 - Present**  
PNT Specialist. Write the proposal, draft the international research and review report (deliverable), and design the indoor/outdoor seamless positioning service standard.
- **Toward Ubiquitous Indoor Localization Using Implicit Fingerprint Crowdsourcing and Heterogeneous Signal Fusion** **06/2020 - Present**  
Leader. This project aims to overcome challenges of fingerprint-based localization to achieve ubiquitous positioning. We study the advanced implicit fingerprint crowdsourcing and fusion-based localization schemes to develop large-scale deployable indoor localization system.
- **Indoor Scene Understanding and Indoor Localization** **03/2016 - 06/2019**  
Leader. The goal of this project is to understand indoor scenes around users with multi-modal data (images, Wi-Fi, IMU, etc.) and improve indoor localization and navigation performance with semantic information. Algorithms and technical skills covered including deep learning, fingerprinting-based localization, particle filter, etc.
- **Multi-Sensor Fusion based Indoor Localization with Smartphones** **06/2015 - 02/2016**  
Implemented a multi-sensor fusion based indoor localization method. This method can improve traditional WiFi fingerprinting based indoor localization system by integrating magnetic fingerprints and pedestrian dead-reckoning.
- **Smartphone-based Indoor Localization System with QR Code** **02/2014 - 12/2014**  
Designed an indoor localization method with QR code on a smartphone. This system locates user with photogrammetry and barcode information. The algorithm was implemented on the Android platform (Java). An open-source project named ZXing has been adopted for barcode resolving.
- **Pedestrian Detection in Video** **09/2013 - 01/2014**  
Improved the accuracy and efficiency for an existing pedestrian detection system. Added new functions to support multi-pedestrian detection and remove non-pedestrian objects. The algorithm was implemented with C++ and OpenCV.

## PUBLICATIONS

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- **(Ongoing)** Mengyun Liu, S.-H. Gary Chan, "High Accurate Vehicle Navigation with Raw GNSS Measurement from Smartphone".
- **(Under published)** Mengyun Liu, Steve Zhou, and S.-H. Gary Chan, "HiFi-Loc: Hierarchical Graph Learning for Implicit Fingerprinting with Incomplete Indoor Maps".
- **(Under published)** Mengyun Liu, Gary W.-H. Cheung, and S.-H. Gary Chan, "Towards Ubiquitous LBS: Map Standards and Infrastructure Developments".
- H. Ai, X. Sun, J. Tao, M. Liu, S. Li. "DRVAT: Exploring RSSI series representation and attention model for indoor positioning," *International Journal of Intelligent Systems*, 2021; 1-27. doi: 10.1002/int.22712.
- G. Li, C.-C. Hung, M. Liu, L. Pan, W.-C. Peng and S.-H. Gary Chan, "Spatial-Temporal Similarity for Trajectories with Location Noise and Sporadic Sampling," in *Proceedings of 37th International Conference on Data Engineering (ICDE)*, Chania, Crete, Greece, 19 - 22, April 2021.
- J. Tan, E. Sumpena, W. Zhuo, Z. Zhao, M. Liu and S. -H. G. Chan, "IoT Geofencing for COVID-19 Home Quarantine Enforcement," in *IEEE Internet of Things Magazine*, vol. 3, no. 3, pp. 24-29, September 2020, doi: 10.1109/IOTM.0001.2000097.
- M. Liu, R. Chen, H. Ai, Y. Chen, D. Li. "Unsupervised Visual Representation Learning for Indoor Scenes with a Siamese ConvNet and Graph Constraints," *Preprints 2019*, 2019030189.
- Y. Xu, R. Chen, Y. Li, P. Zhang, J. Yang, X. Zhao, Liu. M, D. Wu. "Multispectral Image Segmentation Based on a Fuzzy Clustering Algorithm Combined with Tsallis Entropy and a Gaussian Mixture Model," *Remote Sensing*, vol. 11, no. 23, 2772, 2019.
- G. Guo, R. Chen, F. Ye, L. Chen, Y. Pan, M. Liu, Z. Cao. "A Pose Awareness Solution for Estimating Pedestrian Walking Speed,". *Remote Sensing*, vol. 11, no. 1, 55, 2019.
- Y. Chen, R. Chen, M. Liu, A. Xiao, D. Wu, S. Zhao. "Indoor Visual Positioning Aided by CNN-Based Image Retrieval: Training-Free, 3D Modeling-Free," *Sensors*, vol. 18, no. 8, 2692, 2018.
- M. Liu, R. Chen, D. Li, Y. Chen, G. Guo, Z. Cao, and Y. Pan, "Scene Recognition for Indoor Localization Using a Multi-Sensor Fusion Approach," *Sensors*, vol. 17, no. 12, 2847, 2017.
- H. Ai, M. Liu, M. Shi, J. Zhao. Floor Identification with Commercial Smartphones in WiFi-Based Indoor Localization System. *ISPRS Congress 2016*, Prague, Czech Republic. **(Oral, Corresponding author)**
- H. Ai, Y. Men, L. Han, Z. Li, M. Liu. "High precision gesture sensing via quantitative characterization of the doppler effect," In *23rd International Conference on Pattern Recognition (ICPR)*, Cancún, México, 4 - 8, Dec. 2016.