<div align="center">**EXTENDED CURRICULAM VITAE**</div>

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ACADEMIC POSITIONS

04/2020-Present   **Research Assistant Professor**, Department of Aeronautical and Aviation Engineering, The Hong Kong Polytechnic University, Hong Kong

08/2018-04/2020   **Postdoctoral Fellow**, Department of Aeronautical and Aviation Engineering, The Hong Kong Polytechnic University, Hong Kong (work with **Dr. Li-Ta Hsu**)

EDUCATION

09/2012-06/2018   **PhD** in **Navigation, Guidance and Control** (Nanjing University of Science and Technology, Nanjing, China. Advisor: Prof. Lei Dou)

09/2008-06/2012   **BSc** in **Network Engineering** (Nanjing University of Science and Technology, Nanjing, China)

RESEARCH INTERESTS

- Signal processing with application to localization and wireless communications
- Global navigation satellite system receiver design
- Mitigation of radio frequency interference including jamming and spoofing

TEACHING EXPERIENCE

- **Flight Mechanics and Control Systems** (**AAE4006**), The Hong Kong Polytechnic University, 2020-2021 Semester II
- **Dynamical Systems and Control** (**AAE3004**), The Hong Kong Polytechnic University, 2020-2021 Semester I, 2021-2022 Semester I
- **Advanced Avionics Systems** (**ME583**), The Hong Kong Polytechnic University (Teaching Assistant), 2018-2019 Semester I and 2019-2020 Semester I

PROFESSIONAL MEMBERSHIPS

- Institute of Electrical and Electronics Engineers (IEEE), USA, Member, May 2020-present

- **IEEE Aerospace and Electronic Systems Society Membership**
- **IEEE Instrumentation and Measurement Society Membership**
  - **Institute of Navigation** (ION), USA, Professional Member, Nov 2018-present

ACADEMIC ACTIVITIES

- **Guest editor** of special issue "All-Source Position and Navigation: An Alternative Solution for Resilient PNT" in *Applied Sciences*
- **Guest editor** of special issue "Advanced Technologies for Position and Navigation under GNSS Signal Challenging or Denied Environments" in *Remote Sensing*
- **Reviewer** for *IEEE Transactions on Aerospace and Electronic Systems*, *IEEE Communications Letters*, *IEEE Signal Processing Letters*, *Measurement and Control*, *Journal of Navigation*, *International Journal of Communication Systems*, *Remote Sensing*, *Sensors*, etc.

RESEARCH PROJECTS INVOLVED

In the capacity of **PI**:

1. Research on direct position estimation based GNSS and 5G positioning and GNSS/5G deep integration mechanism, 1 Jan 2022~31 Dec 2024.
   - Funding body: National Natural Science Foundation of China (NSFC) 國家自然科學基金委員會
   - Funding scheme: NSFC for Young Scholar 國家自然科學基金委員會青年科學基金項目

2. Research on GNSS Vector Tracking based Anti-multipath Mechanism in Urban Environment, 1 Jan 2022~31 Dec 2024.
   - Funding body: 廣東省基礎與應用基礎研究項目 廣東省科學技術廳
   - Funding scheme: 廣東省基礎與應用基礎研究項目

3. Security reinforcement for high-precision fusion positioning, 1 Dec 2021 ~ 30 Nov 2022
   - Funding body: Huawei Technologies Co. Ltd.
   - Funding scheme: Huawei Technologies Co. Ltd. (Collaborative)

4. A-GNSS Based Direct Position Estimation: Modelling, Implementation and Performance Assessment, 15 Mar 2021~14 Mar 2023
   - Funding body: The Hong Kong Polytechnic University (UGC)
   - Funding scheme: Start-up Fund for RAPs under the Strategic Hiring Scheme

5. Detection and Localization of Radio Frequency Interference Source for GBAS Reference Stations in Terminal Area, 15 Jul 2020~13 Jul 2023.
   - Funding body: The Hong Kong Polytechnic University (UGC)
   - Funding scheme: Departmental Start-up Fund

6. Radio Frequency Interference Monitoring in Terminal Area, 1 Aug 2021 ~ 1 Oct 2022
   - Funding body: The Hong Kong Polytechnic University (UGC)
   - Funding scheme: Undergraduate Research and Innovation Scheme (URIS)

In the capacity of **Co-PI**:

7. Reliable Multiagent Collaborative Global Navigation Satellite System Positioning for Intelligent Transportation Systems, 1 Jun 2022 - 31 May 2025,
    − Funding body: RGC
    − Funding scheme: Research Impact Fund (RIF)

In the capacity of **Co-I**:

8. Unlocking the potential of AI edge intelligence and cloud-edge computing for flexible robotic and facility control system, 2 Jul 2021 ~ 1 Jul 2023
    − Funding body: Innovation and Technology Commission
    − Funding scheme: Innovation and Technology Fund - Partnership Research Programme (ITF-PRP)

9. Factor Graph Optimization for GNSS Positioning, 30 Jun 2021 ~ 29 Apr 2022
    − Funding body: Huawei Technologies Co. Ltd.
    − Funding scheme: Huawei Technologies Co. Ltd. (Collaborative)

10. Ultra-Tightly Coupled GNSS/INS Integration for Smartphone, 25 Dec 2018 ~ 24 Jan 2020
    − Funding body: Huawei Technologies Co. Ltd.
    − Funding scheme: Huawei Technologies Co. Ltd. (Collaborative)

As the role of **Member**:

11. Map Aided GNSS Urban Positioning Phase II, 12 Aug 2019 - 31 Dec 2020
    − Funding body: Huawei Technologies Co. Ltd.
    − Funding scheme: Huawei Technologies Co. Ltd. (Collaborative)

JOURNAL PUBLICATIONS (*: Corresponding author, #: Student author)

2022

1. A. Dey[#], **B. Xu***, X. Lu, N. Sharma (2022) GNSS Code Multipath Time-frequency Analysis Using Wavelet-based Synchrosqueezing Transform in Urban Environments, *IEEE Geoscience and Remote Sensing Letters*, Accepted (**IF: 3.966,** JCR **Q1**, 61/273 in Engineering, Electrical & Electronic)

2. C. Jiang, Y. Chen, **B. Xu**, J. Jia, H. Sun, C. Chen, Z. Duan, J. Hyyppä (2022) Vector Tracking Based on Factor Graph Optimization for GNSS NLOS Bias Estimation and Correction, *IEEE Internet of Things Journal*, published online, DOI: 10.1109/JIOT.2022.3150764 (**IF: 9.471,** JCR **Q1**, **6/161** in Computer Science, Information Systems, **Top** journal)

3. A. Dey[#], K. Iyer, **B. Xu***, N. Sharma, and Hsu, L.-T. (2022) Carrier-Aided Dual Frequency Vectorized Tracking Architecture for NavIC Signals, *IEEE Transactions on Instrumentation and Measurement*, 71:1-13 (**IF: 4.016,** JCR **Q1**, 11/64 in Instruments & Instrumentation)

2021

4. C. Jiang, **B. Xu***, L.-T. Hsu (2021) Probabilistic Approach to Detect and Correct GNSS NLOS Signals Using an Augmented State Vector in the Extended Kalman Filter, *GPS Solutions* 25(72):1-14 (**IF: 4.066,** JCR **Q2**, 13/32 in Remote Sensing)

5. Q. Jia, L.-T. Hsu, **B. Xu**, R. Wu (2021) A cost-effective beam forming structure for global

navigation satellite system multipath mitigation and its assessment, ***Journal of Navigation*** 74(2):425-445 (**IF: 1.995,** JCR **Q2**, 7/16 in Engineering, Marine)

6. J. Dou, **B. Xu**, L. Dou (2021) Impact Assessment of the Asynchronous Clocks Between Reference and User Receivers in Differential Pseudolite Navigation System, ***IEEE Sensors Journal*** 21(1): 403 – 411 (**IF: 3.301,** JCR **Q2**, 20/64 in Instruments & Instrumentation)

7. G. Zhang, **B. Xu**, H.-F. Ng, L.-T. Hsu (2021) GNSS RUMS: GNSS Realistic Urban Multiagent Simulator for Collaborative Positioning Research, ***Remote Sensing*** 13(4): 544 (**IF: 4.848,** JCR **Q1**, 27/200 in Geosciences, Multidisciplinary)

2020

8. **B. Xu**, Q. Jia, L.-T. Hsu (2020) Vector Tracking Loop-Based GNSS NLOS Detection and Correction: Algorithm Design and Performance Analysis, ***IEEE Transactions on Instrumentation and Measurement*** 69(7):4604-4619 (**IF: 4.016,** JCR **Q1**, 11/64 in Instruments & Instrumentation)

9. A. El-Mowafy, **B. Xu**, L.-T. Hsu (2020) Integrity monitoring using multi-GNSS pseudorange observations in the urban environment combining ARAIM and 3D city models, ***Journal of Spatial Science***, DOI: 10.1080/14498596.2020.1734109

10. G. Zhang, W. Wen, **B. Xu**, L.-T. Hsu (2020) Extending Shadow Matching to Tightly-Coupled GNSS/INS Integration System, ***IEEE Transactions on Vehicular Technology*** 69(5):4979-4991 (**IF: 5.978,** JCR **Q1**, 32/273 in Engineering, Electrical & Electronic)

2019

11. **B. Xu**, L.-T. Hsu (2019) Open-source MATLAB code for GPS vector tracking on a software-defined receiver, ***GPS Solutions*** *23*:46 (**IF: 4.066,** JCR **Q2**, 13/32 in Remote Sensing)

12. **B. Xu**, Q. Jia, Y. Luo, L.-T. Hsu (2019) Intelligent GPS L1 LOS/Multipath/NLOS Classifiers Based on Correlator-, RINEX- and NMEA-Level Measurements. ***Remote Sensing*** 11:1851 (**IF: 4.848,** JCR **Q1**, 27/200 in Geosciences, Multidisciplinary)

13. J. Dou, **B. Xu**, L. Dou (2020) An intelligent joint filter for vector tracking loop considering noise interference, ***Optik*** 22:164984 (**IF: 2.443,** JCR **Q2**, 47/99 in Optics)

14. Q. Meng, L.-T. Hsu, **B. Xu**, X. Luo, A. El-Mowafy (2019) A GPS Spoofing Generator Using an Open Sourced Vector Tracking-Based Receiver, ***Sensors*** 19:3993 (**IF: 3.576,** JCR **Q1**, 14/64 in Instruments & Instrumentation)

15. Y. Luo, J. Li, C. Yu, **B. Xu**, Y. Li, L.-T. Hsu, N. El-Sheimy (2019) Research on Time-Correlated Errors Using Allan Variance in a Kalman Filter Applicable to Vector-Tracking-Based GNSS Software-Defined Receiver for Autonomous Ground Vehicle Navigation, ***Remote Sensing*** 11:1026 (**IF: 4.848,** JCR **Q1**, 27/200 in Geosciences, Multidisciplinary)

16. J. Dou, **B. Xu**, L. Dou (2019) Performance assessment of GNSS scalar and vector frequency tracking loops, ***Optik*** 202:163552 (**IF: 2.443,** JCR **Q2**, 47/99 in Optics)

2018

17. **B. Xu**, L. Dou (2018) GNSS IF Signal Simulation Considering Oscillator Phase Noise, *Journal of Navigation* 71(4): 805-820 (**IF: 1.995,** JCR **Q2**, 7/16 in Engineering, Marine)

18. **B. Xu**, L. Dou (2018) Benefits of long coherent integration for CZT-based GPS signal acquisition, *Electronics Letters* 54(16):995-997

19. **B. Xu**, L. Dou, J. Dou (2018) Analysis of PCB Temperature Effects on GNSS Receiver's Tracking Loop, *Instrument Technique and Sensor* 6:49-52 (Chinese Core Journal Criterion of PKU, in Chinese)

2017

20. **B. Xu**, L. Dou (**2017**) Novel acquisition of global positioning system signals based on parameter prediction and the chirp z-transform, *Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering* 231(8):1391-1401

Papers Undergoing Review (*: Corresponding author, #: Student author)

1. J. Yue, **B. Xu***, L.-T. Hsu, Data Denoising Based on Hadamard Matrix Transformation and Rayleigh Quotient Maximization: Application to GNSS Signal Classification, *IEEE Transactions on Instrumentation and Measurement*, submitted

2. C.-L. Tsang, Y. Luo, **B. Xu**, L.-T. Hsu, C/N0 Assessment Based on GPS L5/L1C/A Signal Acquisition in Open-Sky/Light-Urban/Dense-Urban/Indoor Environments, *Advances in Space Research*, submitted

Conference papers

2022

1. K. Iyer, A. Dey, **B. Xu**, N. Sharma (2022) A Modified Extended Kalman Filter Approach for Seamless Indoor/Outdoor Global Navigation Satellite System Positioning- A Proof of Concept, *ION GNSS+ 2022*, submitted

2. H. Xu, **B. Xu**, L.-T. Hsu (2022), 3DMA Sky Visibility Matching: An Example using a Simulated LEO Constellation, *ION ITM 2022, Long Beach, California, January 25-27, 2022.*

3. J. Fang, S. Vicenzo, J. Marcelino and **B. Xu** (2022), Adaptive GNSS Positioning Strategy Switching: Metric Modelling, Algorithm Design and Performance Analysis, *The International Conference on Smart Living, Hong Kong, March 31-April 1, 2022.* (**UG student paper**)

4. S. Vicenzo, J. Marcelino and **B. Xu** (2022), Ultra-tight GNSS/UWB integration for seamless indoor/outdoor pedestrian navigation, *The International Conference on Smart Living, Hong Kong, March 31-April 1, 2022.* (**UG student paper**)

5. Z. Li, J. Fang and **B. Xu** (2022), Vector Tracking Loop Based Mixed-Level Satellite Signal Type Classification in Urban Areas, ***The International Conference on Smart Living***, *Hong Kong, March 31-April 1, 2022.* （**UG student paper**）

2020

6. **B. Xu** (Presenter), L.-T. Hsu, T. Suzuki (2020), Intermediate Frequency Level GPS Multipath Simulator based on Vector Tracking and Ray-tracing, ***ION ITM 2020***, *San Diego, California, January 21-24, 2020.*

2019

7. **B. Xu (**Presenter**)**, L.-T. Hsu (2019), NLOS Detection and Compensation using a Vector Tracking-based GPS Software Receiver, *Proceedings of the 2019 Pacific PNT Meeting,* ***ION Pacific PNT 2019***, *Honolulu, Hawaii, April 8-11, 2019.*

8. Y. Luo, C. Yu, **B. Xu**, G.-J. Tsai, J. Li, Y. Li, N. El-Sheimy (2019), Assessment of Ultra-Tightly Coupled GNSS/INS Integration System towards Autonomous Ground Vehicle Navigation Using Mobile-Phone IMU, ***IEEE International Conference on Signal, Information and Data Processing 2019***, *Chongqing, China, December 11-13, 2019.*

9. **B. Xu** (Poster), L.-T. Hsu (2019), NLOS signal detection and correction based on vector tracking in urban environments, *Proceedings of the* ***CSNC 2019***, *Beijing, China, May 2019.*

2018

10. H. Xu, G. Zhang, **B. Xu**, L.-T. Hsu (2018), GNSS Shadow Matching based on Intelligent LOS/NLOS Classifier, ***IAIN 2018***, *Japan*.

2016

11. **B. Xu** (Presenter), L. Dou (2016), Performance of the Vector Tracking Loop Assisted by Desired Trajectory during Short Signal Outages, *Proceedings of* ***2016 IEEE Chinese Guidance, Navigation and Control Conference***, *August 12-14, 2016, Nanjing, China.*