Huan WU

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EDUCATION

Ph.D., Electronic Engineering, The Chinese University of Hong Kong, 2018
Research area: Optical Fiber Sensing, Digital Signal Processing
Dissertation: *Digital Signal Processing Techniques Assisted Distributed Brillouin Optical Time Domain Analyzer Fiber Sensor*
Dissertation Advisors: Prof. Shu, Chester Ching Tat

B.Eng., Information Engineering, Nanjing University of Aeronautics and Astronautics, 2013

WORKING EXPERIENCE

Research Assistant Professor, Department of Electronic and Information Engineering, The Hong Kong Polytechnic University, 2022/10-present
Research area: Optical fiber sensing and its applications

Postdoc Research Fellow, Department of Land Surveying and Geo-Information, 2020/10-2022/10
Research area: Applications of distributed optical fiber sensors in Civil Engineering
Advisors: Prof. Xiaoli DING

Postdoc Research Fellow, Department of Electronic and Information Engineering, 2018/10-2020/10
Research area: Distributed optical fiber sensors
Advisors: Prof. Chao LU

Research Assistant, Department of Information Engineering, 2013/07-2014/07
Research area: Microwave photonics
Advisors: Prof. Shilong PAN

SELECTIVE PUBLICATIONS

H. Wu, H. F. Duan, Wallace Lai, K. Zhu, X. Cheng, H. Yin, B. Zhou, C. C. Lai, C. Lu, and X. L. Ding. "Leveraging optical communication fiber and AI for distributed water pipe leak detection," *IEEE Communications Magazine,* to appear.

H. Zheng, **H. Wu***, C. Y. Leong, Y. Y. Wang, X. L. Shen, Z. Fang, X. Chen, J. X. Cui, D. J. Ma, Y. Miao, L. Zhou, M. Yan, J. Sun, H. Y. Tam, X. L. Ding, C. Lu. "Enhanced quasi-distributed accelerometer

array based on phase-OTDR and ultraweak fiber Bragg grating," *IEEE Sensors Journal, early access,* 2023.

H. Zheng[+], **H. Wu[+*]**, D. J. Ma, Y. Miao, L. Zhou, M. Yan, J. Sun, C. Y. Yu, X. L. Ding, C. Lu. "Novel mining conveyor monitoring system based on quasi-distributed optical fiber accelerometer array and self-supervised learning," *Under review*.

Y. Y. Wang, H. Zheng, **H. Wu**, D. M. Huang, C. Y. Yu, and C. Lu. "Coherent OTDR with large dynamic range based on double-sideband linear frequency modulation pulse," *Optics Express,* 31(11), 17165-17174, 2023.

H. Wu, B. Zhou, K. Zhu, C. Shang, H.Y. Tam, and C. Lu. "Pattern recognition in distributed fiber-optic acoustic sensor using an intensity and phase stacked convolutional neural network with data augmentation," *Optics Express*, 29(3), 3269-3283, 2021.

Z. Y. Zhao[+], **H. Wu[+]**, J. H. Hu, K. Zhu, Y. L. Dang, Y. X. Yan, M. Tang, and C. Lu. "Interference fading suppression in phase-OTDR using space-division multiplexed probes," *Optics Express*, 29(10), 15452-15462, 2021.

K. Zhu, B. Zhou, **H. Wu[*]**, C. Shang, L. Y. Lu, M. Adeel, Y. Y. Xi, Z. Y. Zhao, H. Y. Tam and C. Lu. "Multipath distributed acoustic sensing system based on phase-sensitive optical time-domain reflectometry with frequency division multiplexing technique," *Optics and Lasers in Engineering*, 142, 106593, 2021.

H. Wu, C. Shang, K. Zhu, and C. Lu, "Vibration detection in distributed acoustic sensor with threshold-based technique: a statistical view and analysis," *Journal of Lightwave Technology*, 39(12), 4082-4093, 2020.

M. Adeel, C. Shang, D. Hu, **H. Wu**, K. Zhu, A. Raza, C. Lu, 'Impact-based feature extraction utilizing differential signals of phase-sensitive OTDR,' *Journal of Lightwave Technology*, 38(8), 2539-2546, 2020.

H. Wu[+], H. D. Wang[+], C. Shu, C. S. Choy, and C. Lu, "BOTDA fiber sensor system based on FPGA accelerated support vector regression," *IEEE Transactions on Instrumentation and Measurement*, 69(6), 3826-3837, 2019.

H. Wu, L. Wang, Z. Zhao, C. Shu, C. Lu, "Support vector machine based differential pulse-width pair Brillouin optical time domain analyzer," *IEEE Photonics Journal*, 10(4),1-11, 2018.

H. Wu, L. Wang, Z. Zhao, N. Guo, C. Shu, C. Lu, 'Brillouin optical time domain analyzer sensors assisted by advanced image denoising techniques,' *Optics Express*, 26(5), 5126-5139, 2018.

H. Wu, L. Wang, N. Guo, C. Shu, C. Lu, 'Support vector machine assisted BOTDA utilizing combined Brillouin gain and phase information for enhanced sensing accuracy,' *Optics Express*, 25(25), 31210-31220, 2017.

N. Guo, L. Wang, **H. Wu**, C. Jin, H. Y. Tam, C. Lu, 'Enhanced coherent BOTDA system without trace averaging,' *Journal of Lightwave Technology*, 36(4), 871-878, 2017.

H. Wu, L. Wang, N. Guo, C. Shu, C. Lu, 'Brillouin optical time-domain analyzer assisted by support vector machine for ultrafast temperature extraction,' *Journal of Lightwave Technology*, 35(19), 4159-4167, 2017.

Talks

"Harnessing the power of light: the journey of distributed optical fiber sensors," *Chongqing University summer visit to PolyU*, *July 2023*.

"Optical fiber sensing applications in real-time assets health monitoring for building structures." *Webinar on Application of Automation and Technology in Construction Materials Testing*, Hong Kong Council for Testing and Certification, *Feb 2023*.

TEACHING

EIE 515 Advanced Optical Communication Systems, *2023/2024 (upcoming)*

Teaching assistant experiences in CUHK
- ELEG3303 Fundamental of Photonics, *Fall 2014*
- ELEG3320 Introduction to Optical Communication, *Spring 2015*
- ENGG1100 Introduction to Engineering Design, *Fall 2015*
- ELEG3320 Introduction to Optical Communication, *Spring 2016*
- ENGG1100 Introduction to Engineering Design, *Fall 2016*
- ELEG3601 Introduction to Electric Power Systems, *Spring 2017*
- ELEG3320 Introduction to Optical Communication, *Fall 2017*
- ELEG3601 Introduction to Electric Power Systems, *Fall 2018*

PROFESSIONAL SERVICES

Consultant for *Water Supplies Department, The Government of Hong Kong SAR*
Project: Consultancy study on distributed fiber optic system for leak detection for water mains in Anderson Road Quarry Development Site, ongoing

Reviewer for *Optics Express*, *Photonics Journal*, *Journal of Lightwave Technology*, *Optics and Lasers in Engineering*

RELEVANT SKILLS

Hands on skills in fiber-optic related systems
Programming ability in Python and Matlab
Fluent in English, Cantonese, and Mandarin