Huanle Zhang

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RESEARCH INTERESTS

Embedded Computing: Mobile Systems and Applications; Internet of Things (IoT); Artificial Intelligence (AI) and Applications; Simultaneous Localization and Mapping (SLAM)

Immersive Videos: Interactive video streaming, rendering, and quality of experience; Virtual Reality (VR) 360 videos; 3D volumetric videos

Wireless Networking: Design and analysis of wireless networks; 5G cellular communications; Wi-Fi; Bluetooth Low Energy (BLE)

EDUCATION

Ph.D. in Computer Science,   2016 – expected 2020
University of California, Davis, CA, USA
Advisor: Prasant Mohapatra

M.S. in Communication Engineering,   2011 - 2014
University of Electronic Science and Technology of China, Chengdu, Sichuan, China
Advisor: Jian Liu

B.S. in Communication Engineering,   2007 – 2011
Hangzhou Dianzi University, Hangzhou, Zhejiang, China
Advisor: Na Ying

AWARDS

- **Best Paper Award** at the ACM Conference on Embedded Networked Sensor Systems (SenSys) for work titled "When Pipelines Meet Fountain: Fast Data Dissemination in Wireless Sensor Network", 2015.

- **Demo Runner-up Award** at the ACM Workshop on Mobile Computing Systems and Applications (HotMobile) for demo titled "AIDE: Augmented Onboarding of IoT Devices at Ease", 2019.

- **Nokia National Patent Filing Award** for the patent titled "Augmented Onboarding of Internet-of-Things Devices", 2019.

- **Travel Grant Awards** for IEEE GLOBECOM 2013 and ACM HotMobile 2019.

- **National Scholarship for Graduate Students of China**, 2014.

- **Honorable Mention** for Interdisciplinary Contest in Modeling, 2010.

PATENTS

1. Fang Hao, Sarit Mukherjee, Mostafa Uddin, and **Huanle Zhang**, *Augmented Onboarding of Internet-of-Things Devices*, US Patent App. 16/247,797.

2. Bo Han, Cheuk Yiu Ip, **Huanle Zhang**, and Eric Zavesky, *Method for Accelerating Three-dimensional Object Segmentation with Point Cloud Simplification*, US Patent App.

PUBLICATIONS

JOURNALS

1. Pengfei Hu, Parth H. Pathak, **Huanle Zhang**, Zhicheng Yang, and Prasant Mohapatra. *High Speed LED-to-Camera Communication using Color Shift Keying with Flicker Mitigation*. IEEE Transactions on Mobile Computing (**TMC**), 2019.

2. **Huanle Zhang**, Wan Du, Mo Li, Kaishun Wu, and Prasant Mohapatra. *StrLight: An Imperceptible Visible Light Communication System with String Lights*, IEEE Transactions on Mobile Computing (**TMC**), 18(7):1674–1687, 2019.

3. **Huanle Zhang**, Wan Du, Pengfei Zhou, Mo Li, and Prasant Mohapatra. *An Acoustic-based Encounter Profiling System*, IEEE Transactions on Mobile Computing (**TMC**), 17(8):1750–1763, 2018.

4. Wan Du, Jansen Christian Liando, **Huanle Zhang**, and Mo Li. *Pando: Fountain-Enabled Fast Data Dissemination with Constructive Interference*, IEEE/ACM Transactions on Networking (**TON**), 25(2):820–833, 2017.

5. **Huanle Zhang**, Jian Liu, and Haili Shi. *Analysis of Accessing to the Nearest and to the Strongest Base Station in Femtocell Networks*, International Journal of Communication Systems (**IJCS**), DOI:10.1002/dac.2851, 2014.

6. **Huanle Zhang**, Jian Liu, Yu Fu, and Niangeng Guo. *OFDMA Femtocell Gateway Scheduling Based on Coloring*, Advances in Information Sciences and Service Sciences (**AISS**), 5(12):192–203, 2013.

CONFERENCES AND WORKSHOPS

1. **Huanle Zhang**, Bo Han and Prasant Mohapatra. *Toward Mobile 3D Vision*. IEEE International Conference on Computer Communications and Networks (**ICCCN**), Honolulu, Hawaii, USA.

2. Tianbo Gu, Allaukik Abhishek, Hao Fu, **Huanle Zhang**, Debraj Basu and Prasant Mohapatra. *Towards Learning-automation IoT Attack Detection through Reinforcement Learning*. IEEE International Symposium on A World of Wireless, Mobile and Multimedia Networks (**WoWMoM**), Cork, Ireland, 2020.

3. **Huanle Zhang**, Mostafa Uddin, Fang Hao, Sarit Mukherjee, and Prasant Mohapatra. *AIDE: Augmented Onboarding of IoT Devices at Ease*. ACM Workshop on Mobile Computing Systems and Applications (**HotMobile**), Santa Cruz, USA, 2019.

4. **Huanle Zhang**, Ahmed Elmokashfi, and Prasant Mohapatra. *WiFi and Multiple Interfaces: Adequate for Virtual Reality?*. IEEE Conference on Parallel and Distributed Systems (**ICPADS**), Singapore, 2018.

5. **Huanle Zhang**, Wan Du, Pengfei Zhou, Mo Li, and Prasant Mohapatra. *DopEnc: Acoustic-based Encounter Profiling Using Smartphones*, ACM Conference on Mobile Computing and Networking (**MobiCom**), New York, USA, 2016.

6. Wan Du, Jansen Christian Liando, **Huanle Zhang**, and Mo Li. *When Pipelines Meet Fountain: Fast Data Dissemination in Wireless Sensor Network*, ACM Conference on Embedded Networked Sensor Systems (**SenSys**), Seoul, South Korea, 2015.

7. **Huanle Zhang**, Jian Liu, Yupeng Jia, and Yulu Ma. *Analysis of Femtocell Coverage Fraction and Isolated Probability Using Stochastic Geometry*, IEEE Global Communications Conference (**GLOBECOM**), Atlanta, USA, 2013.

8. **Huanle Zhang**, Yu Fu, and Jian Liu. *Optimal Transmission Distance of Mean Progress and Mean Transport in Device-to-device Networks*, International Conference on Cyberspace Technology (**CCT**), Beijing, China, 2013.

9. **Huanle Zhang**, Jian Liu, and Niangeng Guo. *A Tractable Framework for Power Consumption in Femtocell Networks*, International Conference on Multimedia Information Networking and Security (**MINES**), Beijing, China, 2013.

10. **Huanle Zhang**, and Jian Liu. *Policy on Downlink Access of Femtocell Based on OFDMA in Dense Employment Residential Environment*, International Conference on Software Engineering and Information System (**SEIS**), Shijiazhuang, China, 2013.

POSTERS AND DEMOS

1. Zhicheng Yang, Parth H. Pathak, Muchen Wu, Tingting Zhu, Junai Gan, **Huanle Zhang**, Jingyuan Zheng, and Prasant Mohapatra. *Poster: Non-invasive Soluble Sugar Content Estimation using Millimeter-wave*, Aligning the Food System for Improved Nutrition in Animal Source Foods, UC Davis, 2019.

2. **Huanle Zhang**, Zhicheng Yang, and Prasant Mohapatra. *Poster: Wireless Access to Ultimate Virtual Reality 360-Degree Video*, ACM/IEEE International Conference on Internet of Things Design and Implementation (**IoTDI**), 2019.

3. **Huanle Zhang**, Mostafa Uddin, Fang Hao, Sarit Mukherjee, and Prasant Mohapatra. *Poster and Demo: AIDE: Augmented Onboarding of IoT Devices at Ease*. ACM Workshop on Mobile Computing Systems and Applications (**HotMobile**), Santa Cruz, USA, 2019.

4. Zhicheng Yang, Parth H Pathak, Jianli Pan, Mo Sha, **Huanle Zhang**, and Prasant Mohapatra. *Poster: Blockage-aware Deployment of 60 GHz Millimeter-wave WLANs*, NSF Millimeter-Wave Research Coordination Network Workshop (**mmW RCN workshop**), Montreal, Canada, 2019.

PAPERS UNDER SUBMISSION

1. **Huanle Zhang**, Mostafa Uddin, Fang Hao, Sarit Mukherjee, and Prasant Mohapatra. *MAIDE: Mobile Augmented Onboarding of IoT Devices at Ease*.

2. **Huanle Zhang**, Ahmed Elmokashfi, Zhicheng Yang and Prasant Mohapatra. *Wireless Access to Ultimate Virtual Reality 360-Degree Video At Home*, arXiv:1812.01777.

3. **Huanle Zhang**, Bo Han, Cheuk Yiu Ip, and Prasant Mohapatra. *All Points Are Not Equal – Accelerating 3D Segmentation with Point Cloud Simplification*.

RESEARCH AND WORK EXPERIENCE

AT&T University Program   Feb. 2019 - Feb. 2020
Project Title: Deep Learning for Mobile Immerse Computing
Mentor: Bo Han

- A year-long research collaboration with AT&T labs – research. Investigated the system challenges of utilizing deep learning for improving the network efficiency and quality of experience for mobile augmented reality. Researched on deep learning based 3D segmentation and classification for mobile devices.

Research Intern   June 2019 - Aug. 2019
AT&T Labs – Research, Bedminster, New Jersey, USA
Mentors: Bo Han, and Cheuk Yiu Ip

- Developed a technique to reduce the computation and memory overheads of 3D scene segmentation and meanwhile increase accuracy. Applied data simplifications to reduce the size of point clouds. Conducted measurements of 3D mixed reality DNN models on mobile devices.

Research Intern   June 2018 - Aug. 2018
Bell Labs, Crawford Hill, New Jersey, USA
Mentors: Mostafa Uddin, Fang Hao, and Sarit Mukherjee

- Developed a mobile system for onboarding IoT devices using received signal strength. Designed voting-based algorithms to associate visual objects with their beacon IDs. Proposed an augmented reality based mechanism to systematically select measurement locations and duration.

Research Intern   March 2018 - June 2018
Microsoft Research Asia, Beijing, China
Mentor: Yunxin Liu

- Researched on distributed models, model compression, and image super-resolution. Designing gate networks to guide input of different complexity to optimized backbone neural networks of various capabilities in order to speed up the overall system inference and increase system accuracy.

Research Intern   July 2017 - Sep. 2017
Simula Research Laboratory, Fornebu, Norway
Mentor: Ahmed Elmokashfi

  - Developed a MPTCP based system for reducing delays and jitters of TCP and UDP packets. Conducted
    research on wireless networking for virtual reality 360 videos. Surveyed the challenges of supporting
    different levels of VR 360 at homes.

Project Officer   Aug. 2014 - June 2016
Nanyang Technological University, Singapore
Mentor: Mo Li

  - Developed a visible light communication system that uses string lights composed of a large number of
    small LEDs to transmit data without light flickers. Developed an acoustic system for profiling encounters,
    which leverages the Doppler effect to infer intentions. Developed a fast data dissemination method for
    sensor networks by leveraging constructive interference.

TEACHING EXPERIENCE

  - **Teaching Assistant:** Data Structure and Programming (ECS 60). 2017 Fall, University of California, Davis.

PROFESSIONAL SERVICES

  - **Technical Program Committee:** International Conference on Wireless and Mobile Communications (ICWMC)
    2020; International Conference on Evolving Internet (INTERNET) 2020.

  - **Journal Reviewer:** IEEE Transactions on Mobile Computing (TMC) 2019; IEEE Transactions on Service
    Computing (TSC) 2019; IEEE Transactions on Vehicular Technology (TVT) 2019; International Journal of
    Sensors, Wireless Communications and Control (SWCC) 2019; EURASIP Journal on Wireless Communica-
    tions and Networking (JWCN) 2015; IEEE Internet of Things Journal (IoT) 2013-14, 2019-20.

  - **Conference Reviewer:** IEEE Global Communications Conference (GLOBECOM) 2014.