

Pan He

CONTACT INFORMATION

E402 CSE Bldg
Gainesville, FL 32611
Phone: +1 (352) 215-7007

Github: [Pan He](#)
Personal website: [Pan He](#)
Email: pan.he@ufl.edu

EDUCATION

- University of Florida**, Gainesville, USA
• Ph.D. in Computer Science August 2017 - present
• Advisors: Prof. Sanjay Ranka and Prof. Anand Rangarajan
- University of Florida**, Gainesville, USA
• M.S. in Electrical and Computer Engineering August 2016 - August 2017
• Later transferred to the Ph.D. program
- Sichuan University**, Chengdu, China
• B.E. in Software Engineering September 2011 - June 2015

RESEARCH INTERESTS

Fields: Computer Vision; Machine Learning; High Performance Computing; Intelligent Transportation

Topics: Point Cloud Processing; Scene Understanding; Efficient Parallel Training and Inference; Traffic analysis; Self- and Weakly-Supervised Learning

HONORS AND AWARDS

- | | |
|---|------|
| Doctoral Consortium Award @ CVPR | 2022 |
| Gartner Group Graduate Fellowship, UFL | 2022 |
| Doctoral Consortium Award @ ICCV | 2021 |
| International Center Outstanding Achievement Awards, UFL | 2021 |
| Gartner Group Graduate Fellowship, UFL | 2021 |
| Departmental Nomination for the Informatics Institute Fellowship, UFL | 2021 |
| Departmental Nomination for the Google PhD Fellowship, UFL | 2020 |
| Gartner Group Graduate Fellowship, UFL | 2020 |
| CAS Dean's Award for Innovation and Creativity, SIAT | 2016 |
| Bachelor Thesis Awarded First Prize, Sichuan University | 2015 |
| Outstanding Undergraduates Awards, Sichuan University | 2015 |
| First Prize Scholarship, Sichuan University | 2014 |
| Second Prize, China International Software Design and Application Contest | 2014 |
| Outstanding Team, Chinasoft Internship Project | 2014 |
| Third Prize, Southwestern Invitational Programming Contest | 2013 |
| Provincial Third Prize, Lan Qiao Cup, Software Entrepreneurship Team | 2013 |
| National Encouragement Scholarship, Sichuan University | 2013 |
| National Encouragement Scholarship, Sichuan University | 2012 |

RESEARCH EXPERIENCE

MALTLab, **University of Florida**, Gainesville, USA
Graduate Research Assistant August 2017 - present
Advised by [Prof. Anand Rangarajan](#) and [Prof. Sanjay Ranka](#). My duties included:

- Being the main contributor for proposal writing
- Mentoring graduate and undergraduate students for research projects
- Developing novel algorithms for scene flow estimation, shape correspondence learning, and infrastructures-to-intersections (I2I)
- Analyzing, planing, designing and constructing transportation infrastructure networks containing multiple traffic sensors, e.g., LIDARs and Cameras

Megvii Research US, Seattle, USA

Research Intern

May 2017 - August 2017

Advised by **Dr. Jue Wang**. My duties included:

- Developing deep learning algorithms for portrait segmentation
- Implementing bilateral filter with GPU Acceleration

NSF I/UCRC Center for Big Learning, University of Florida, Gainesville, USA

Research Assistant

August 2016 - May 2017

Advised by **Dr. Xiaolin Li**. My duties included:

- Developing algorithms for scene text detection and recognition, e.g., **SSTD**, **Guided CTPN**
- Developing algorithms for adversarial examples and malware detection, e.g., **Adaptive Attack**, **PROPEDEUTICA**

Multimedia Laboratory, Chinese University of Hong Kong, Hong Kong, China

Research Assistant

October 2015 - July 2016

Advised by **Prof. Chen Change Loy** and **Prof. Xiaoou Tang**. My duties included:

- Developing the end-to-end scene text understanding system
- Collaborating with the OCR team of the startup company **SenseTime**

Multimedia Laboratory, Shenzhen Institutes of Advanced Technology, Shenzhen, China

Research Assistant

September 2014 - July 2016

Advised by **Prof. Weilin Huang** and **Prof. Yu Qiao**. My duties included:

- Developing the first deep LSTM-CTC model for scene text recognition, i.e., **DTRN**
- Deploying our developed scene text algorithms to the projects of the **Huawei** team

National University of Singapore, Singapore

Summer Intern

July 2014 - September 2014

- Selected as one college representative student to attend courses and activities at NUS

PUBLICATIONS

Google Citations: 2662, H-index: 8

Submitted & In Preparation

1. Patrick Emami, **Pan He**, Sanjay Ranka, Anand Rangarajan. Slot Order Matters for Compositional Scene Understanding. Under Review

Book

1. Shuchun Liu, **Pan He**, Jianqi Ma, Jiajun Wang. Dive into OCR: Scene Text Understanding with Deep Learning. *China Machine Press (CMP)*, [link](#), 2020

Peer Reviewed Journals

1. Abdullah Almutairi*, **Pan He***, Anand Rangarajan, Sanjay Ranka. Automated Truck Taxonomy Classification Using Deep Convolutional Neural Networks. *International Journal of Intelligent Transportation Systems Research*. 2022
2. Xiaohui Huang, **Pan He**, Anand Rangarajan, Sanjay Ranka. Machine Learning based Real-time Multi-Camera Vehicle Tracking and Travel Time Estimation. *Journal of Imaging*, 2022
3. **Pan He***, Aotian Wu*, Xiaohui Huang, Anand Rangarajan, Sanjay Ranka. Machine Learning-based Highway Truck Commodity Classification Using Logo Data. *Applied Sciences*, 2021
4. **Pan He**, Patrick Emami, Sanjay Ranka, Anand Rangarajan. Learning Scene Dynamics from Point Cloud Sequences. *International Journal of Computer Vision (IJCV)*, 2021
5. Ruimin Sun, Xiaoyong Yuan, **Pan He**, Qile Zhu, Aokun Chen, Andre Gregio, Daniela Oliveira, Xiaolin Li. Learning Fast and Slow: PROPEDEUTICA for Real-time Malware Detection. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 2021

6. **Pan He**, Aotian Wu, Xiaohui Huang, Jerry Scott, Anand Rangarajan, Sanjay Ranka. Truck and Trailer Classification with Deep Learning based Geometric Features. *IEEE Transactions on Intelligent Transportation (T-ITS)*, 2020
7. Xiaohui Huang, **Pan He**, Anand Rangarajan, Sanjay Ranka. Intelligent Intersection: Two-Stream Convolutional Networks for Real-time Near Accident Detection in Traffic Video. *ACM Transactions on Spatial Algorithms and Systems (T-SAS)*, 2019
8. Xiaoyong Yuan, **Pan He**, Qile Zhu, Xiaolin Li. Adverarial Examples: Attacks and Defenses for Deep Learning. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, **top-5 popular**, 2018

Peer Reviewed Conferences and Workshops

1. **Pan He**, Patrick Emami, Anand Rangarajan, Sanjay Ranka. Self-Supervised Robust Scene Flow Estimation via the Alignment of Probability Density Functions. *AAAI Conference on Artificial Intelligence (AAAI)*, 2022
2. Haonan Qiu, **Pan He**, Shuchun Liu, Weiyuan Shao, Feiyun Zhang, Jiajun Wang, Liang He, Feng Wang. Ego-Deliver: A Large-Scale Dataset for Egocentric Video Analysis. *ACM International Conference on Multimedia (ACM-MM)*, 2021
3. Patrick Emami, **Pan He**, Anand Rangarajan, Sanjay Ranka. Efficient Multi-object Iterative Variational Inference. *International Conference on Machine Learning (ICML)*, 2021
4. Patrick Emami, **Pan He**, Anand Rangarajan, Sanjay Ranka. How to Fit Uncertainty for both Discovery and Dynamics in Object-centric World Models. *Object Representations for Learning and Reasoning, NeurIPS Workshop (ORLR)*, 2020 (**Oral**)
5. Keke Zhai*, **Pan He***, Tania Banerjee, Anand Rangarajan, Sanjay Ranka. SparsePipe: Parallel Deep Learning for 3D Point Clouds. *IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC)*, 2020
6. **Pan He**, Aotian Wu, Xiaohui Huang, Anand Rangarajan, Sanjay Ranka. Video-based Machine Learning System for Commodity Classification. *International Conference on Vehicle Technology and Intelligent Transportation System (VEHITS)*, 2020 (**Oral**)
7. Xiaoyong Yuan, **Pan He**, Xiaolin Li. Adaptive Adversarial Attack on Scene Text Recognition. *International Workshop on Security and Privacy in Big Data (PSBD)*, 2020
8. **Pan He**, Aotian Wu, Xiaohui Huang, Jerry Scott, Anand Rangarajan, Sanjay Ranka. Deep Learning based Geometric Features for Effective Truck Selection and Classification from Highway Videos. *Intelligent Transportation Systems Conference (ITSC)*, 2019
9. Shuchun Liu, Feiyun Zhang, Mingxi Chen, Yufei Xie, **Pan He**, Jie Shao. Document Binarization using Recurrent Attention Generative Model. *British Machine Vision Conference (BMVC)*, 2019
10. Xiaoyu Yue, Zhanghui Kuang, Zhaoyang Zhang, Zhenfang Chen, **Pan He**, Yu Qiao, Wei Zhang. Boosting up Scene Text Detectors with Guided CNN. *British Machine Vision Conference (BMVC)*, 2018 (**Oral**)
11. **Pan He**, Weilin Huang, Tong He, Qile Zhu, Yu Qiao, Xiaolin Li. Single Shot Text Detector with Regional Attention. *IEEE International Conference on Computer Vision (ICCV)*, 2017 (**Spotlight**)
12. **Pan He***, Weilin Huang*, Yu Qiao, Chan Change Loy, Xiaoou Tang. Reading Scene Text in Deep Convolutional Sequences. *AAAI Conference on Artificial Intelligence (AAAI)*, 2016 (**Oral**)
13. Zhi Tian, Weilin Huang, Tong He, **Pan He**, Yu Qiao. Detecting Text in Natural Image with Connectionist Text Proposal Network. *European Conference on Computer Vision (ECCV)*, 2016

Patents

1. "APPARATUS AND METHOD FOR DETECTING SCENE TEXT"
US Patent: App. 62/579,324 with Xiaolin Li.

2. "METHODS AND APPARATUS FOR RECOGNIZING TEXT IN AN IMAGE"
International Patent: PCT/CN2015/081308 with Xiaoou Tang, Yu Qiao, Chan Change Loy and Weilin Huang.

PROFESSIONAL
SERVICE

Editorship

- Guest editor, Rising Stars in Image Processing 2022, *Frontiers in Signal Processing*

Program Committee

- Program Committee of AAAI Conference on Artificial Intelligence (AAAI), 2022
- Technical Programme Committee of International Conference on Informatics (ICI), 2022
- Novel Program Committee Board (PCB) of ICJAI, 2022–2024
- Program Committee of International Joint Conference on Artificial Intelligence (ICJAI), 2021
- Program Committee of AAAI Conference on Artificial Intelligence (AAAI), 2021
- Program Committee of AAAI Conference on Artificial Intelligence (AAAI), 2020
- Program Committee of ACM International Conference on AI in Finance (ICAIF), 2020
- Technical Programme Committee of International Conference on Machine Learning and Data Science (ICMLDS), 2019
- Technical Programme Committee of International Conference on Machine Learning and Data Science (ICMLDS), 2018
- Program Committee of Conference on Computer Vision and Pattern Recognition (CVPR), 2018
- Technical Programme Committee of International Conference on Machine Learning and Data Science (ICMLDS), 2017

Journal Reviewer

- Reviewer of IEEE Transactions on Image Processing (TIP)
- Reviewer of IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- Reviewer of IEEE Transactions on Intelligent Transportation Systems (T-ITS)
- Reviewer of International Journal on Document Analysis and Recognition (IJ DAR)
- Reviewer of Knowledge and Information Systems (KIS)
- Reviewer of International Journal of Intelligent Transportation Systems Research (IJIT)

Conference Reviewer

- Reviewer of International Conference on Learning Representations (ICLR), 2022
- Reviewer of IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2019, 2020, 2021, 2022
- Reviewer of International Conference on Machine Learning (ICML), 2021 and 2022
- Reviewer of Conference on Neural Information Processing Systems (NeurIPS), 2020, 2021, 2022
- Reviewer of IEEE International Conference on Computer Vision and Pattern Recognition (ICCV), 2019, 2021
- Reviewer of European Conference on Computer Vision (ECCV), 2020, 2022
- Reviewer of British Machine Vision Conference (BMVC), 2019, 2020, and 2021
- Reviewer of Winter Conference on Applications of Computer Vision (WACV), 2020, 2021, and 2022
- Reviewer of Asian Conference on Computer Vision (ACCV), 2018 and 2020
- Reviewer of International Conference on Pattern Recognition (ICPR), 2018
- Reviewer of Transportation Research Record (TRR), 2020

PROJECT
EXPERIENCE

Bigdata Analytics and Artificial Intelligence for Smart Intersections, Gainesville, USA

Project Developer

September 2019 - May 2022

- Write the report for the funded FDOT project (BDV31 977-116)
- Develop algorithms for edge-based video-stream and LIDAR processing at intersections to convert traffic road users' data into space-time trajectories of individual vehicles and pedestrians that are transmitted and synthesized on a cloud-based system.

Truck Taxonomy and Classification using Video and Weigh-In-Motion (WIM) Technology, Gainesville, USA

Project Developer

September 2017 - May 2019

- Write the report for the funded FDOT project (BDV31-977-81)
- Develop an automated system for truck detection and classification from high-resolution video.

MIPS Simulation, Gainesville, USA

Project Developer

September 2018 - November 2018

- Implementation of **the MIPS code simulation and the assembly code generation**

Simulators of Distributed System Protocols, Gainesville, USA

Team Leader and Project Developer

September 2017 - November 2017

- Implementations of classic protocols **Pastry** and **Gossip** in Elixir

B+ Tree, Gainesville, USA

Project Developer

September 2017 - November 2017

- An in-memory B+ Tree **implementation**

Facebook Open Academy, Palo Alto, USA

Project Developer

September 2013 - May 2014

- Selected as one college representative student to implement HBase functions of **GeoGig**

URL Source Detection, Tracking and Statistics Module, Chengdu, China

Team Leader and Project Developer

September 2013 - February 2014

- Develop a web crawler to identify active web portals with Naive Bayesian Classifiers. The resulting algorithm is the **second place winner** of China International Software Design and Application Contest

TEACHING
ACTIVITIES

EEL 6935, Big Data Ecosystem, Gainesville, USA

Teaching Assistant

January 2017 - April 2017

- Assist in preparing class plans, e.g., **InClass Kaggle Competition**
- Serve as guidance for students when help was needed

Student Science Training Program (SSTP), Gainesville, USA

Curriculum Design and Course Instructor

June 2018 - July 2018

- **Intro to Machine Learning**. Introduce high school students to the exciting and rapidly evolving field of artificial intelligence and machine learning

STUDENT
MENTORING

Ke Chen, now a PhD student at University of Florida

2021 - present

Xiao Li, now a PhD student at University of Florida

2022 - present

Aotian Wu, now a PhD student at University of Florida

2019 - present

Christopher Moffitt, now working at NASA

2018 - 2019

Caleb Bryant, now working at Facebook

2017 - 2018

PROFESSIONAL
SOCIETIES

AAAS, member

2020 - present

AAAI, member

2021 - present

ACM, student member

2021 - present

IEEE, student member

2018 - present