

# HAIPENG CHEN

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## RESEARCH INTEREST

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Artificial Intelligence, Machine Learning, Data Mining, Multi-Agent Systems, Algorithmic Game Theory, with emphasis on AI for Social Goodness (e.g., Cybersecurity, Intelligent Transportation)

## EDUCATION

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**Ph.D. in Computer Science** 01/2014 – 05/2018  
Nanyang Technological University, Singapore  
Advisors: Bo An & Yeng Chai Soh  
Thesis: Large Scale Strategic Decision Making in Multi-Agent Systems

**B.Sc. in Physics** 07/2009 – 07/2013  
University of Science and Technology of China, Hefei, China

## RESEARCH APPOINTMENTS

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**Postdoctoral Research Associate** 07/2018 –  
Department of Computer Science, Dartmouth College  
Advisor: V.S. Subrahmanian

**Research Intern** 11/2017 – 05/2018  
Didi Rising-Star Internship, Didi Chuxing

**Research Intern** 08/2013 – 11/2013  
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

## AWARDS

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- **Runner-Up, Demonstration Innovation Award, IJCAI'19** 2019  
In our paper, “VEST: A System for Vulnerability Exploit Scoring and Timing”, we present a demo system which predicts the severity and exploit timing of cyber vulnerabilities using social media data.
- Didi Rising-Star Internship, Didi Chuxing 2018  
I worked on the project InBEDE, which integrates contextual bandit algorithm with temporal difference learning for pricing and dispatch of online ride-hailing platforms. The paper was accepted to ICDM'19.
- **Champion, Microsoft Malmo Collaborative AI Challenge** 2017  
Microsoft Collaborative AI Challenge asked teams to solve a Minecraft game using collaborative agents to push the state of the art of collaborative AI. 81 teams from 26 countries entered the challenge and our agent HogRider won the first place. **Media coverage:**
  - Presenting the winners of the Project Malmo Collaborative AI Challenge
  - Microsoft Malmo Collaborative AI Challenge: Chinese teams on winning list, big prizes! (In Chinese)
  - SCSE Team HogRider wins first place for the Microsoft Azure for Research grant prize!
- Recommended for Teaching, University Teaching Certificate, NTU 2015

## PUBLICATIONS

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Note: all my papers **with Prof. Subrahmanian** are in **alphabetical** order, where <sup>†</sup> means I am a major contributor. Authors of other papers are ordered according to contribution unless otherwise specified.

## Articles Under Review

[R3] Chongyang Bai, **Haipeng Chen**<sup>†</sup>, Srijan Kumar, Jure Leskovic, and V.S. Subrahmanian. PPAMI: Predictive Persuasion Analysis of Multimodal Information.

[R2] Xu He, **Haipeng Chen**, Bo An. Adaptive Light Control by Inferring Human Light Preference from Imperfect Feedback.

[R1] **Haipeng Chen**<sup>†</sup>, Mauro Conti, Luca Pajola, and V.S. Subrahmanian. StyleVAE: Preserving Styles in Text Generation.

## Journal Articles

[J5] **Haipeng Chen**<sup>†</sup>, Qian Han, Sushil Jajodia, Roy Lindelauf, V.S. Subrahmanian and Yanhai Xiong. Disclose or Exploit? A Game Theoretic Approach Towards Strategic Decision Making in Cyber Warfare. IEEE Systems Journal (**ISJ**), accepted.

[J4] **Haipeng Chen**, Mohammad T. Hajiaghayi, Sarit Kraus, Anshul Sawant, Edoardo Serra, V.S. Subrahmanian and Yanhai Xiong. PIE: A Data-Driven Payoff Inference Engine with Counter-Terrorism Applications. IEEE Transactions on Computational Social Systems (**TCSS**), accepted.

[J3] Yuanyuan Wu, **Haipeng Chen**, and Feng Zhu. DCL-AIM: Decentralized Coordination Learning of autonomous intersection management for connected and automated vehicles, Transportation Research, Part C: Emerging Technologies (**TR-C**), 2019.

[J2] **Haipeng Chen**, Bo An, Dusit Niyato, Yengchai Soh, Chunyan Miao. Workload factoring and resource sharing via joint vertical and horizontal cloud federation networks, IEEE Journal on Selected Areas in Communications (**JSAC**), 2017.

[J1] Bo An, **Haipeng Chen**<sup>†</sup>, Noseong Park, V.S. Subrahmanian. Data-driven frequency-based airline profit maximization, ACM Transactions on Intelligent Systems and Technology (**TIST**), 2017.

## Conference Proceedings

[C9] **Haipeng Chen**, Yan Jiao, Zhiwei (Tony) Qin, Xiaocheng Tang, Hao Li, Bo An, Hongtu Zhu, Jieping Ye. InBEDE: Integrating Contextual Bandit with Temporal Difference Learning for Pricing and Dispatch of On-Line Car-Hailing Platform. Proceedings of the 19th IEEE International Conference on Data Mining (**ICDM'19**). (Regular paper, acceptance rate  $95/1046 = 9.1\%$ )

[C8] **Haipeng Chen**<sup>†</sup>, Jing Liu, Rui Liu, Noseong Park, V.S. Subrahmanian. VASE: Vulnerability Scoring and Analysis Engine. Proceedings of the 19th IEEE International Conference on Data Mining (**ICDM'19**). (Short paper, acceptance rate  $194/1046 = 18.5\%$ )

[C7] **Haipeng Chen**, Jing Liu, Rui Liu, Noseong Park, V.S. Subrahmanian. VEST: A System for Vulnerability Exploit Scoring and Timing. Proceedings of the 28th International Joint Conference on Artificial Intelligence (**IJCAI'19**), demo paper. **Demonstration Innovation Award runner up.**

[C6] **Haipeng Chen**<sup>†</sup>, Sushil Jajodia, Jing Liu, Noseong Park, Vadim Sokolov, and V. S. Subrahmanian. Fake Tables: Using GAN to Generate Functional Dependency Preserving Tables with Bounded Real Data. Proceedings of the 28th International Joint Conference on Artificial Intelligence (**IJCAI'19**). (Oral+poster, acceptance rate  $850/4752 = 17.9\%$ )

[C5] Wei Qiu, **Haipeng Chen**, and Bo An. Dynamic Electronic Toll Collection via Multi-Agent Deep Reinforcement Learning with Edge-Based Graph Convolutional Network Representation. Proceedings of the 28th International Joint Conference on Artificial Intelligence (**IJCAI'19**). (Oral+poster, acceptance rate  $850/4752 = 17.9\%$ )

[C4] **Haipeng Chen**<sup>†</sup>, Rui Liu, Noseong Park, and V.S. Subrahmanian. Using Twitter to Predict When Vulnerabilities will be Exploited. Proceedings of the 25th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD'19**). (Applied data science track, poster, acceptance rate  $\sim 20\%$ )

[C3] Yanhai Xiong\*, **Haipeng Chen**\*, Mengchen Zhao, Bo An. HogRider: Champion agent of Microsoft Malmo collaborative AI challenge. Proceedings of the 32nd AAAI Conference on Artificial Intelligence (**AAAI'18**). **Winner of Microsoft Malmo Collaborative AI Challenge**. \*Equal contribution. (Oral, acceptance rate  $933/3800 = 24.6\%$ )

[C2] **Haipeng Chen**, Bo An, Guni Sharon, Josiah Hanna, Peter Stone, Chunyan Miao, Yeng Chai Soh. DyETC: Dynamic electronic toll collection for traffic congestion alleviation. Proceedings of the 32nd AAAI Conference on Artificial Intelligence (**AAAI'18**). (Oral, acceptance rate  $933/3800 = 24.6\%$ )

[C1] Bo An, **Haipeng Chen**<sup>†</sup>, Noseong Park, V.S. Subrahmanian. MAP: Frequency-Based Maximization of Airline Profits based on an Ensemble Forecasting Approach, Proceedings of the 22nd ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD'16). (Applied data science track, poster, acceptance rate  $\sim 20\%$ )

## Pending Patent

**Haipeng Chen**, Zhiwei (Tony) Qin, Yan Jiao, Xiaocheng Tang, Bo An, Hongtu Zhu, and Jieping Ye. InBEDE: Integrating Contextual Bandit with TD Learning for Pricing and Dispatch of Online Ride-Hailing Platforms.

## TEACHING EXPERIENCES

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Teaching Assistant, Math Refresher Spring'17  
(Instructor: Patricia Y. J. Wong)

Teaching Assistant, EE2006, Engineering Mathematics I Fall'16  
(Instructor: Patricia Y. J. Wong)

## RESEARCH SUPERVISION

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- Almas Abdibayev (PhD, Department of Computer Science, Dartmouth College). One working paper (with Deepti Poluru).
- Chongyang Bai (PhD, Department of Computer Science, Dartmouth College). One paper under review.
- Qian Han (PhD, Department of Computer Science, Dartmouth College). One paper accepted to ISJ.
- Xu He (PhD, School of Computer Science and Engineering, Nanyang Technological University). One paper under submission.
- Rui Liu (PhD, Department of Computer Science, Dartmouth College). Three papers accepted to KDD, IJCAI and ICDM.
- Luca Pajola (Master, Department of Computer Science, University of Padua). One paper under review.
- Deepti Poluru (Master, Department of Computer Science, Dartmouth College). One working paper (with Almas Abdibayev).
- Wei Qiu (PhD, School of Computer Science and Engineering, Nanyang Technological University). One paper accepted to IJCAI.
- Yuanyuan Wu (PhD, School of Civil and Environmental Engineering, Nanyang Technological University). One paper accepted to TR-C.

## PROFESSIONAL SERVICE

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### Student Volunteer

WI-IAT (2015)

**Technical program committee member**

AAAI (2019/2020)

AAMAS (2019/2020)

IJCAI (2019/2020)

**Journal reviewer**

European Journal of Operational Research (2019)

IEEE Intelligent Systems (2018/2019)

Journal of Computer and System Sciences (2018)

ACM Transactions on Computational Logic (2018)

Energy and Buildings (2017)