Yuede (YJ) Ji

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EDUCATION

2015.9 - 2021.8 **Ph.D.** in Computer Engineering
Department of Electrical & Computer Engineering
The George Washington University
Advisor: H. Howie Huang

2012.9 - 2015.6 **M.S.** in Computer Science
School of Computer Science and Technology
Jilin University
Advisor: Qiang Li

2008.9 - 2012.6 **B.E.** in Software Engineering
School of Software Engineering
Jilin University

APPOINTMENTS

2021.8 - present **Assistant Professor**
Department of Computer Science and Engineering
University of North Texas

2023.6 - 2023.8 **Visiting Faculty**
Oak Ridge National Laboratory
Host: Dr. Seung-Hwan Lim

2020.6 - 2020.12 **Senior Intern**
Quokka, McLean, VA
Mentor: Dr. Mohamed Elsabagh

AWARDS

2023 *Best Poster Award* at Smoky Mountains Computational Sciences Data Challenge (SMCDC)

2015 *Outstanding Master Thesis Award*, Jilin University

2014 *Best Paper Award* at International Conference on Network and Parallel Computing (NPC)

RESEARCH - PUBLICATIONS (The students advised by me are underlined.)

Refereed Conference Proceedings

In total, 8 top publications (i.e., listed on csrankings.org): SC 3, HPDC 2, USENIX Security 2, ISSTA 1.

[USENIX Security '24] Haojie He, Xingwei Lin, Ziang Weng, Ruijie Zhao, Shuitao Gan, Libo Chen, **Yuede Ji**, Jiashui Wang, and Zhi Xue. Code is not Natural Language: Unlock the Power of Semantics-Oriented Graph Representation for Binary Code Similarity Detection. In the 33rd USENIX Security Symposium.

[EDBT '24] Chenxi Qiu, Sourabh Yadav, **Yuede Ji**, Anna Squicciarini, Ramanamurthy Dantu, Juanjuan Zhao, and Chengzhong Xu. Fine-Grained Geo-Obfuscation to Protect Workers' Location Privacy in Time-Sensitive Spatial Crowdsourcing. In the 27th International Conference on Extending Database Technology (EDBT).

[ICC '24] Trent Reichenbach, Chenglong Fu, Xiaojiang Du, Jia Di, **Yuede Ji**. TrustEvent: Cross-Platform IoT Trigger Event Verification Using Edge Computing. In 2024 IEEE International Conference on Communications (ICC).

[SC '23] Wang Feng, Shiyang Chen, Hang Liu, and **Yuede Ji**. PeeK: A Prune-Centric Approach for K Shortest Path Computation. In 2023 ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC), 2023.
First PhD student's first paper

[SC '23] Shiyang Chen, Da Zheng, Caiwen Ding, Chengying Huan, **Yuede Ji**, and Hang Liu. Tango: Re-Thinking Quantization for Graph Neural Network Training on GPUs, In 2023 ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC), 2023.

[ISSTA '23] Lei Cui, Jiancong Cui, **Yuede Ji**, Zhiyu Hao, Lun Li, Zhenquan Ding. API2vec: Learning Representations of API Sequences for Malware Detection. ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), 2023

[SMCDC '23] Yasmeen Haleem, Isabelle Wagenvoord, Qianjun Wei, Ting Xiao, Tong Shu, and **Yuede Ji**. Understanding Nationwide Power Outage and Restoration for Future Prediction. 7th Annual Smoky Mountains Computational Sciences Data Challenge (SMCDC), 2023
Best Poster Award

[SMCDC '23] Joseph Caldwell, Wang Feng, Mimi Byun, Mark Albert, Tong Shu, and **Yuede Ji**. Exploring Power and Thermal Dynamics in the Summit Supercomputer: A Data Visualization Study. 7th Annual Smoky Mountains Computational Sciences Data Challenge (SMCDC), 2023

[HPDC '22] Qiang Fu, **Yuede Ji**, H. Howie Huang. TLPGNN: A Lightweight Two-Level Parallelism Paradigm for Graph Neural Network Computation on GPU. In 31st International Symposium on High-Performance Parallel and Distributed Computing (HPDC), 2022.

[EuroS&P '22] Haoyu He, **Yuede Ji**, H. Howie Huang. Illuminati: Towards Explaining Graph Neural Networks for Cybersecurity Analysis. In IEEE European Symposium on Security and Privacy.

[IEEE ICC '22] **Yuede Ji**, H. Howie Huang. NestedGNN: Detecting Malicious Network Activity with Nested Graph Neural Networks. In IEEE International Conference on Communications.

[USENIX Security '21] **Yuede Ji**, Mohamed Elsabagh, Ryan Johnson, Angelos Stavrou. DEFInit: An Analysis of Exposed Android Init Routines. In the 30th USENIX Security Symposium.

[AsiaCCS '21] **Yuede Ji**, Lei Cui, and H. Howie Huang. Differentiating Source-Binary Code Similarity with Graph Triplet-Loss Network. In the 16th ACM ASIA Conference on Computer and Communications Security (AsiaCCS), 2021.

[ACNS '21] **Yuede Ji**, Lei Cui, and H. Howie Huang. Vestige: Identifying Binary Code Provenance for Vulnerability Detection. In the 19th International Conference on Applied Cryptography and Network Security (ACNS), 2021.

[RAID '20] Benjamin Bowman, Craig Laprade, **Yuede Ji**, and H. Howie Huang. Detecting Lateral Movement in Enterprise Computer Networks with Unsupervised Graph AI. In 23rd International Symposium on Research in Attacks, Intrusions and Defenses (RAID), 2020.

[HPDC '20] **Yuede Ji**, H. Howie Huang, Aquila: Adaptive Parallel Computation of Graph Connectivity Queries. In 29th International Symposium on High-Performance Parallel and Distributed Computing (HPDC), 2020.

[HPCC '20] **Yuede Ji**, Hang Liu, and H. Howie Huang. SwarmGraph: Analyzing Large-Scale In-Memory Graphs on GPUs. In IEEE International Conference on High Performance Computing and Communications (HPCC), 2020

[ICCC '19] **Yuede Ji**, Benjamin Bowman, and H. Howie Huang. Securing malware cognitive systems against adversarial attacks. In 2019 IEEE International Conference on Cognitive Computing (ICCC), 2019.

[SC '18] **Yuede Ji**, Hang Liu, and H. Howie Huang, iSpan: Identifying Strongly Connected Components with Spanning Trees, In 2018 ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC), 2018.

[NPC '14] Jian Cao, Qiang Li, **Yuede Ji**, Yukun He, and Dong Guo. Detection of forwarding-based malicious URLs in online social networks. In 11th IFIP International Conference on Network and Parallel Computing (NPC), 2014. Invited to journal publication, International Journal of Parallel Programming, 2016.
Best Paper Award

[ICPADS '14] **Yuede Ji**, Yukun He, Xinyang Jiang, and Qiang Li. Towards Social Botnet Behavior Detecting in the End Host. In 20th IEEE International Conference on Parallel and Distributed Systems (ICPADS), 2014

[ISPEC '14] **Yuede Ji**, Yukun He, Dewei Zhu, Qiang Li, and Dong Guo. A Multiprocess Mechanism of Evading Behavior-Based Bot Detection Approaches. In 10th International Conference on Information Security Practice and Experience (ISPEC), 2014.

[HPCC '13] **Yuede Ji**, Yukun He, Qiang Li, and Dong Guo. BotCatch: A Behavior and Signature Correlated Bot Detection Approach. In IEEE International Conference on High Performance Computing and Communications (HPCC), 2013.

[NPC '13] Yukun He, Qiang Li, **Yuede Ji**, and Dong Guo. BotInfer: A Bot Inference Approach by Correlating Host and Network Information. In 10th IFIP International Conference on Network and Parallel Computing (NPC), 2013.

Journal Articles

[ACM TOPC '24] Qiang Fu, **Yuede Ji**, Thomas B. Rolinger, and H. Howie Huang. TLPGNN: A Lightweight Two-Level Parallelism Paradigm for Graph Neural Network Computation on Single and Multiple GPUs. ACM Transactions on Parallel Computing, 2024

[ACM TOPC '22] **Yuede Ji**, Hang Liu, Yang Hu, and H. Howie Huang. iSpan: Identifying Strongly Connected Components with Spanning Trees. ACM Transactions on Parallel Computing, 2022

[COMNET '21] Longkang Shang, Dong Guo, **Yuede Ji**, and Qiang Li. Discovering Unknown Advanced Persistent Threat Using Shared Features Mined by Neural Networks. Computer Networks, 2021

[KBS '20] Qi Wang, **Yuede Ji**, Yongsheng Hao, and Jie Cao. GRL: Knowledge Graph Completion with GAN-based Reinforcement Learning. Knowledge-Based Systems, 2020.

[SCN '19] Bo Feng, Qiang Li, **Yuede Ji**, Dong Guo, and Xiangyu Meng. Stopping the cyberattack in the early stage: assessing the security risks of social network users. Security and Communication Networks, 2019.

[IJDSN '17] Yukun He, Qiang Li, Jian Cao, **Yuede Ji**, and Dong Guo. Understanding socialbot behavior on end hosts. International Journal of Distributed Sensor Networks, 2017.

[COSE '16] **Yuede Ji**, Yukun He, Xinyang Jiang, Jian Cao, Qiang Li, Combating the evasion mechanisms of social bots, Computers & Security, Volume 58, Pages 230-249, 2016.

[SCN '15] **Yuede Ji**, Qiang Li, Yukun He, and Dong Guo. BotCatch: leveraging signature and behavior for bot detection. Security and Communication Networks, 8(6): 952-969, 2015.

[IJDSN '15] **Yuede Ji**, Qiang Li, Yukun He, and Dong Guo. Overhead Analysis and Evaluation of Approaches to Host-based Bot Detection. International Journal of Distributed Sensor Networks, 2015.

Book Chapter

[CRC '19] **Yuede Ji**, and Qiang Li. Understanding and Detecting Social Botnet. Botnets: Architectures, Countermeasures, and Challenges, CRC Press, 2019.

Poster

[SC '22] Lillian Wang, Avik Malladi, and **Yuede Ji**. Efficient Sparse Deep Neural Network Computation on GPU, In ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC), 2022. **The first two authors are high school students.**

RESEARCH - GRANTS (Total: $1,232,250, My Share: $940,989)

NSF Collaborative Research: SHF: Small: LEGAS: Learning Evolving Graphs At Scale
- ◇ Role: Lead PI;
- ◇ Total: $600,000; My share: $308,739.00 (51%);
- ◇ Sponsor: National Science Foundation (#2331301);
- ◇ 2024.1 - 2026.12.

NSF CICI: UCSS: Secure Containers in High-Performance Computing Infrastructure
- ◇ Role: PI;
- ◇ Total: $600,000 (Subaward $300,000 to Co-PI: Xing Gao);
- ◇ Sponsor: National Science Foundation (#2319975);
- ◇ 2023.8 - 2026.7.

DOE Efficient Computation for Graph Neural Network Explanation Methods on GPUs
- ◇ Role: Sole PI;
- ◇ Total: $19,000;
- ◇ Sponsor: Department of Energy (Oak Ridge National Laboratory);
- ◇ 2023.6 - 2023.8.

Google Google Cloud Education Credits for Analysis of Computer Algorithms
- ◇ Role: Sole PI;

◇ Total: $5,350 (cloud credits);
◇ Sponsor: Google;
◇ 2022.8 - 2023.8.

Google Scalable and Efficient Computation of Graph Neural Networks on GPUs
◇ Role: Sole PI;
◇ Total: $5,000 (cloud credits);
◇ Sponsor: Google;
◇ 2021.8 - 2022.8.

Google Google Cloud Education Credits for Analysis of Computer Algorithms
◇ Role: Sole PI;
◇ Total: $2,900 (cloud credits);
◇ Sponsor: Google;
◇ 2021.8 - 2022.8.

RESEARCH - Invited Talks

Oct. 2023 Graph-Centric Security, Learning, and Computing
UNT CSE Seminar, Denton, TX

Aug. 2023 Graph-Centric Security, Learning, and Computing
Oak Ridge National Laboratory, Oak Ridge, TN

Jul. 2023 API2Vec: Learning Representations of API Sequences for Malware
ISSTA, Seattle, WA

Apr. 2023 Graph-Centric Security, Learning, and Computing
UNT CSE Seminar, Denton, TX

Apr. 2023 Basics of Software Security
Illinois Institute of Technology, Online Talk

Feb. 2023 Graph Algorithms
Digital Divas 2023, Denton, TX

Feb. 2023 Recent Advances in Security and Privacy
Texas CSTA Chapters Conference 2023, Denton, TX

Nov. 2022 Graph Neural Network Explanation for Cybersecurity Applications
Illinois Institute of Technology, Online Talk

Oct. 2022 Graph AI for Cybersecurity
University of North Texas Cybersecurity Symposium, Denton, TX

Oct. 2022 Code Vulnerability Detection with Graph Algorithm and Learning
University of Guelph, Online Talk

May 2022 NestedGNN: Detecting Malicious Network Activity with Nested Graph Neural Networks
IEEE ICC, Online Talk

Apr. 2022 Graph-Centric Machine Learning for Cybersecurity
Illinois Institute of Technology, Online Talk

Aug. 2021 DEFInit: An Analysis of Exposed Android Init Routines
USENIX Security, Online Talk

Jun. 2021 BugGraph: Differentiating Source-Binary Code Similarity with Graph Triplet-Loss Network
AsiaCCS, Online Talk

Apr. 2021 Graph Centric High-Performance Computing and Application in Cybersecurity
George Mason University, Fairfax, VA

Mar. 2021 Graph Centric High-Performance Computing and Application in Cybersecurity
New Mexico State University, Las Cruces, NM

Mar. 2021 Graph Centric High-Performance Computing and Application in Cybersecurity
University of New Haven, West Haven, CT

Feb. 2021 Graph Centric High-Performance Computing and Application in Cybersecurity
University of North Texas, Denton, TX

Jun. 2021 Vestige: Identifying Binary Code Provenance for Vulnerability Detection
ACNS, Online Talk

Dec. 2020 SwarmGraph: Analyzing Large-Scale In-Memory Graphs on GPUs
HPCC, Online Talk

Jun. 2020 Aquila: Adaptive Parallel Computation of Graph Connectivity Queries
HPDC, Online Talk

Nov. 2018 iSpan: Parallel Identification of Strongly Connected Components with Spanning Trees
SC, Dallas, TX

Dec. 2014 Towards Social Botnet Behavior Detecting in the End Host
ICPADS, Hsinchu, Taiwan

May 2014 A Multiprocess Mechanism of Evading Behavior-Based Bot Detection Approaches
ISPEC, Fuzhou, China

Nov. 2013 BotCatch: A Behavior and Signature Correlated Bot Detection Approach
HPCC, Zhangjiajie, China

TEACHING

2024 Spring CSCE-CSCE-5565: Secure Software Development
University of North Texas

2023 Fall CSCE-5150: Analysis of Computer Algorithms
University of North Texas (evaluation: 4.8)

2023 Spring CSCE-6933: Advanced Topics in CSE on Graph Theory and Graph Neural Network
University of North Texas (evaluation: 4.7/5)

2022 Fall CSCE-5150: Analysis of Computer Algorithms
University of North Texas (evaluation: 4.8/5)

2022 Spring CSCE-5565: Secure Software Systems
University of North Texas (evaluation: 4.7/5)

2021 Fall CSCE-5150: Analysis of Computer Algorithms
University of North Texas (evaluation: 4.8/5)

STUDENT ADVISING & MENTORING

PhD Students

2022 Wang Feng (2022.1 - Present)
Dissertation Topic: High-Performance Graph Analytics for Cybersecurity Applications
IEEE TCHPC travel award ($1,325)

2023 Haiyan Sun (2023.1 - Present)
Dissertation Topic: Applied Machine Learning for Code Vulnerability Detection and Fixing

2023 Paul Phillips (2023.9 - Present)
Dissertation Topic: HPC for Graph Neural Networks

2024 Joseph Caldwell (2024.1 - Present)
Dissertation Topic: Graph Neural Networks

2024 Shanchao Li (2024.1 - Present)
Dissertation Topic: Security for HPC Infrastructures

2024 Yang Cheng (2024.1 - Present)
Dissertation Topic: Security for Large Language Models

Master Students

2021 Siying Li (2021.7 - 2021.9, New York University): Graph Analytics for Code Analysis

2021 Boxiang Guo (2021.7 - 2022.12, San José State University): Graph Embedding Methods

2023 Joseph Caldwell (2023.6 - Present): Large Language Models for Code Analysis
Travel grant ($500) from the CSE Department of UNT
Travel grant ($700) from the College of Engineering of UNT.

2023 Yasmeen Haleem (2023.6 - Present): Large Language Models for Code Vulnerability Fixing
Best Poster Award at SMCDC 2023
Travel grant ($500) from the CSE Department of UNT.

Undergraduate Students

2022 Krishna Tiwadi (2022.9 - 2023.2): Graph-based Source Code Analysis

2022 Vedansh Tembhre (2022.9 - 2023.2): Graph-based Source Code Analysis

2023 Isabelle Wagenvoord (2023.6 - 2023.9): National Power Outage and Recovery Analysis
Best Poster Award at SMCDC 2023
NSF REU travel grant ($1,200)

2023 John Gitahi (2023.8 - present): Graph-based Verification for Large Language Models

2023 Ana Tovar (2023.1 - 2023.5): Container Image Security Analysis

K-12 Students

2022 Lillian Wang (2022.1 - 2023.5): Exploring TVM for Sparse Matrix Computation
Went to MIT as an undergraduate.

2022 Avik Malladi (2022.1 - 2023.5): Exploring TVM for Sparse Matrix Computation
Went to UT Austin as an undergraduate.

2022 Chotepong Victor Tangton (2022.9 - Present): Post Binary Code Similarity Detection
UNT Undergraduate Research Fellowship 2023 - 2024

2022 Donavon Zhang (2022.9 - Present): Container Image Security in HPC
UNT Undergraduate Research Fellowship 2023 - 2024

2022 Sua Cho, (2022.9 - Present): Graph Neural Network Analysis

2022 Neha Nayak (2022.9 - Present): Container Image Security Analysis
UNT Undergraduate Research Fellowship 2023 - 2024

Professional Service

Journal Editorship

2023 - Present Associate Editor: IEEE Open Journal of the Communications Society (OJ-COMS)

2023 - Present Reproducibility Review Board member: IEEE Transactions on Parallel and Distributed Systems (TPDS)

Conference Organizer

2023 Publication Chair: Second Annual Workshop on Cyber Security in High Performance Computing (S-HPC'23)

Technical Program Committee

2023 ACM High-Performance Parallel and Distributed Computing (HPDC)

2023 26th Information Security Conference (ISC)

2023 Learning on Graphs Conference (LoG)

2023 SC Doctoral Showcase Poster Track

2023 SC Workshop on Machine Learning with Graphs in High Performance Computing Environments (MLG-HPCE)

2023 IPDPS Workshop on High Performance Computational Biology (HiCOMB)

2022 Learning on Graphs Conference (LoG)

2021 ACM/IEEE SC Poster Judge

2019 IEEE Security and Privacy (Student PC)

2018 IEEE Security and Privacy (Student PC)

2018 EuroSys (Shadow PC)

Journal Reviewer

2023 IEEE Transactions on Parallel and Distributed Systems (TPDS)

2022 ACM Transactions on Sensor Networks

2022 Knowledge-Based Systems

2022 International Journal of Information and Computer Security

2021 ACM Transactions on Parallel Computing

2021 IEEE Transactions on Industrial Informatics

2021 Cybersecurity

2018 Computer Networks

2018 Security and Communication Networks

2018 Wireless Communications and Mobile Computing

2017 Journal of Parallel and Distributed Computing

2017 Frontiers of Computer Science

2016 IEEE Transactions on Cloud Computing

Panelist

Jan. 2024 National Science Foundation (NSF)

Nov. 2023 National Science Foundation (NSF)

Jun. 2023 National Science Foundation (NSF)

Feb. 2023 National Science Foundation (NSF)

Feb. 2022 National Science Foundation (NSF)

Proposal Reviewer

Oct. 2023 National Center For Transportation Cybersecurity and Resiliency (TraCR), Funded by a $20-million grant from US Department of Transportation

INTERNAL SERVICES

2022 - Present PhD Student Admission Committee, *Department of CS&E, University of North Texas*

2021 - 2022 Cybersecurity Program Committee, *Department of CS&E, University of North Texas*

2021 - 2022 MS of Cybersecurity Admission Committee, *Department of CS&E, University of North Texas*

References

Dr. H. Howie Huang

Professor (Founder of Cybermonic)
Department of Electrical and Computer Engineering
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Phone: (202) 994-0523
Email: howie@gwu.edu

Dr. Angelos Stavrou

Professor (Founder of Quokka)
Bradley Department of Electrical and Computer Engineering
Virginia Tech
Virginia Tech Research Center, STE 04-026, Arlington, Virginia, 22203
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Email: angelos@vt.edu

Dr. Seung-Hwan Lim

Research Scientist
Discrete Algorithms Group
Oak Ridge National Laboratory
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Homepage: `https://www.ornl.gov/staff-profile/seung-hwan-lim`
Phone: (865) 574-1475
Email: lims1@ornl.gov

Dr. Xiaojiang Du

Professor and Anson Wood Burchard Endowed-Chair Professor (IEEE Fellow)
Department of Electrical and Computer Engineering
Stevens Institute of Technology
Burchard 205, Hoboken, NJ 07030
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