

Wenxin Jiang, Ph.D.

Research Engineer

Socket

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RESEARCH THEME

My research interest is mainly focused on securing AI and traditional software supply chain. I am generally interested in studying *software engineering for AI*, *software supply chain security*, and *trustworthy AI*.

EDUCATION

Ph.D, Electrical and Computer Engineering

Purdue University, West Lafayette, IN

2020–2025

M.Sc., Electrical and Computer Engineering

Purdue University, West Lafayette, IN

2024

B.Sc. Applied Physics

Southeast University, Nanjing, China

2016–2020

Study Abroad Program, Engineering Physics

University of California, Santa Barbara, CA

2019

PROFESSIONAL EXPERIENCE

Research Engineer

June 2025 – Present

Socket — Supervised by Dr. Mikola Lysenko

- Conduct applied research and translated findings into production-ready, state-of-the-art data and analysis pipelines for software supply chain security.

Graduate Research Assistant

2021–2025

ECE@Purdue University — Supervised by Dr. James C. Davis

- Published 5 top-tier papers, 6 workshop papers, and 3 technical reports.
- Conducted empirical analysis and mined software repositories to enhance pre-trained AI model reuse.
- Developed automated tools to improve transparency and security of open-source AI model supply chain.
- Designed tools for securing the AI model supply chain, focusing on pickle deserialization and typosquatting detection.
- Worked on NSF-funded award and collaborated with sponsors at Cisco and Google.

Research Intern

July 2024 – May, 2025

Socket Inc. — Supervised by Dr. Mikola Lysenko

- Designed data collection infrastructure for HuggingFace data and implemented migration to PostgreSQL database.
- Developed an LLM-based pickle malware scanner for PyPI and Hugging Face artifacts.
- Researched a novel typosquatting detection method that found thousands of typosquatting attacks and submitted a paper to USENIX Security.

TensorFlow Model Developer

2021–2023

Purdue University × Google — Supervised by Dr. Abdullah Rashwan

- Led a team of 20+ undergraduate students in replicating state-of-the-art AI models, including object detection (YOLO) and panoptic segmentation models (Maskformer) for Google's TensorFlow Model Garden Team.

Teaching Assistant

January – May, 2022

Purdue University — ECE 59500 Advanced Software Engineering

- Developed and designed midterm exams and assignments for a graduate-level course in software engineering, covering topics such as software engineering ethics, failure analysis, and automated testing tools.

REFEREED CONFERENCE PUBLICATIONS (FULL PAPERS) *These venues are CORE2023 rank A or A^{*}.*

- [1] **Jiang**, Çakar, Lysenko, and Davis. *ConfuGuard: Using Metadata to Detect Active and Stealthy Package Confusion Attacks Accurately and at Scale*. Proceedings of the ACM/IEEE 48th International Conference on Software Engineering (**ICSE'26**). 13 pages.
- [2] Kellas, Christou, **Jiang**, Li, Simon, David, Kemerlis, Davis, and Yang. *PickleBall: Secure Deserialization of Pickle-based Machine Learning Models*. Proceedings of the ACM Conference on Computer and Communications Security (**CCS'25**). 23 pages.
- [3] **Jiang**, Yasmin, Jones, Synovic, Kuo, Bielanski, Yuan, Thiruvathukal, and Davis. *PeaTMOSS: Mining Pre-Trained Models in Open-Source Software*. Proceedings of the 21th Annual Conference on Mining Software Repositories (**MSR'24**). 13 pages.
- [4] Jones, **Jiang**, Synovic, Thiruvathukal, and Davis.. *What do we know about Hugging Face? A systematic literature review and quantitative validation of qualitative claims*. Proceedings of the 18th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (**ESEM'24**). 12 pages.
- [5] Jajal, **Jiang**, Tewari, Woo, Lu, Thiruvathukal, and Davis. *Interoperability in Deep Learning: A User Survey and Failure Analysis of ONNX Model Converters*. Proceedings of the 33rd ACM SIGSOFT International Symposium on Software Testing and Analysis (**ISSTA'24**). 13 pages.
- [6] **Jiang**, Synovic, Hyatt, Schorlemmer, Sethi, Lu, Thiruvathukal, and Davis. *An Empirical Study of Pre-Trained Model Reuse in the Hugging Face Deep Learning Model Registry*. Proceedings of the ACM/IEEE 45th International Conference on Software Engineering (**ICSE'23**). 13 pages.

REFEREED JOURNAL ARTICLES (ACCEPTED AND UNDER REVISION)

- [1] **Jiang**, Kim, Cheung, Kim, Thiruvathukal, and Davis. *"I see models being a whole other thing": An Empirical Study of Pre-Trained Model Naming Conventions and A Tool for Enhancing Naming Consistency*. Accepted at Empirical Software Engineering (**EMSE'25**). 47 pages.
- [2] **Jiang**, Banna, Vivek, Goel, Synovic, Klingensmith, Thiruvathukal, and Davis. *Challenges and Practices of Deep Learning Model Reengineering: A Case Study on Computer Vision*. Accepted at Empirical Software Engineering (**EMSE'24**). 63 pages.

OTHER REFEREED WORKS: VISIONS, TOOLS, PRELIMINARY WORKS, COMPETITIONS

- [1] Patil, **Jiang**, Peng, Lugo, Kalu, LeBlanc, Smith, Heo, Aou, Davis. *Recommending Pre-Trained Models for IoT Devices*. Proceedings of the 7th International Workshop on Software Engineering Research & Practices for the Internet of Things (**SERP4IoT'25**). 5 pages.
- [2] **Jiang**, Synovic, Jajal, Schorlemmer, Tewari, Pareek, Thiruvathukal, and Davis. *PTMTorrent: A Dataset for Mining Open-source Pre-trained Model Packages*. Proceedings of the 20th Annual Conference on Mining Software Repositories — Data and Tool Showcase Track (**MSR-Data'23**). 5 pages.
- [3] Davis, Jajal, **Jiang**, Schorlemmer, N. Synovic, and G.K. Thiruvathukal. *Reusing Deep Learning Models Challenges and Directions in Software Engineering*. Proceedings of the IEEE John Vincent Atanasoff Symposium on Modern Computing (**JVA'23**). 14 pages.
- [4] Montes, Peerapatanapokin, Schultz, Guo, **Jiang**, and Davis. *Discrepancies among Pre-trained Deep Neural Networks: A New Threat to Model Zoo Reliability*. Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering — Ideas, Visions, and Reflections track (**ESEC/FSE-IVR'22**). 5 pages.
- [5] **Jiang**, Synovic, Sethi, Indarapu, Hyatt, Schorlemmer, Thiruvathukal, and Davis. *An Empirical Study of Artifacts and Security Risks in the Pre-trained Model Supply Chain*. Proceedings of the 1st ACM Workshop on Software Supply Chain Offensive Research and Ecosystem Defenses (**SCORED'22**). 10 pages.
- [6] Synovic, Hyatt, Sethi, Thota, Shilpika, Miller, **Jiang**, Amobi, Pinderski, Laufer, Hayward, Kingensmith, Davis, and Thiruvathukal. *Snapshot Metrics Are Not Enough: Analyzing Software Repositories with Longitudinal Metrics*. Proceedings of the 37th IEEE/ACM International Conference on Automated Software Engineering — Demonstrations track (**ASE-Tool Demonstrations'22**). 4 pages.
- [7] Veselsky, West, Ahlgren, Thiruvathukal, Klingensmith, Goel, **Jiang**, Davis, Lee, and Kim. *Establishing trust in vehicle-to-vehicle coordination: a sensor fusion approach*. Proceedings of the 23rd Annual International Workshop on Mobile Computing Systems and Application (**HotMobile'22**). 6 pages.

TECHNICAL REPORTS

- [1] Yasmin, **Jiang**, Davis, and Yuan. *Software Dependencies 2.0: An Empirical Study of Reuse and Integration of Pre-Trained Models in Open-Source Projects*. <https://arxiv.org/abs/2509.06085>. 2025.
- [2] Pautsch, Singla, **Jiang**, Peng, Hassanshahi, Läufer, Thiruvathukal, and Davis. *AgentHub: A Research Agenda for Agent Sharing Infrastructure*. <https://arxiv.org/abs/2510.03495>. 2025.
- [3] Peng, Gupte, Eliopoulos, Ho, Mantri, Deng, **Jiang**, Lu, Läufer, Thiruvathukal, and Davis. *Large Language Models for Energy-Efficient Code: Emerging Results and Future Directions*. <https://arxiv.org/abs/2410.09241>. 2024.
- [4] Purohit, **Jiang**, Ravikiran, and Davis. *A Partial Replication of MaskFormer in TensorFlow on TPUs for the TensorFlow Model Garden*. <https://arxiv.org/abs/2404.18801>. 2024.
- [5] Banna, Chinnakotla, Yan, Vigesana, Vivek, Krishnappa, **Jiang**, Lu, Thiruvathukal, and Davis. *An Experience Report on Machine Learning Reproducibility: Guidance for Practitioners and TensorFlow Model Garden Contributors*. <https://arxiv.org/abs/2107.00821>. 2021.

POSTERS

- [1] Schorlemmer, **Jiang**, and Davis. *Machine Learning Supply Chain Security*. 2023 Purdue CERIAS Symposium (**CERIAS'23**). **Award: Best Poster — 2nd-place**.
- [2] **Jiang**, Schorlemmer, and Davis. *Trustworthy Re-use of Pre-trained Neural Networks*. 2023 Purdue CERIAS Symposium (**CERIAS'23**).

PATENTS

- [1] Davis, **Jiang**, Kim, Cheung, Kim. *A Method for Identifying Naming Mismatches in Neural Networks Based on Their Architectural Properties*. U.S. Provisional Patent Application No. 63/813,549. Filed May 28, 2025.
- [2] Aboukhadijeh, Lysenko, **Jiang**. *Typosquatting in Six Public Software Package Registries: Detection, Analysis, and Optimization*. U.S. Provisional Patent Application No. 63/722,005. Filed Nov. 18, 2024.

INVITED TALKS

Trustworthy Reuse in the Model Supply Chain: How Far are We? <i>International Workshop on Large Language Model Supply Chain Analysis (Co-located with ISSTA '25, Norway)</i>	2025
Trustworthy Reuse in Open-Source AI Model Ecosystems: How Far are We? <i>STACK@CS reading group, Virginia Tech</i>	2024
PeaTMOSS: A Dataset and Initial Analysis of Pre-Trained Models in Open-Source Software <i>Research Data Alliance 22nd Plenary Meeting (RDA VP22)</i>	2024
An Empirical Study of Pre-Trained Model Reuse in the Hugging Face Deep Learning Model Registry <i>Purdue University Programming Languages Group, Seminar</i>	2023
Deep Learning Model Reengineering: An Exploratory Case Study on Computer Vision <i>Purdue University Programming Languages Group, Seminar</i>	2022

AWARDS AND RECOGNITION

Distinguished Reviewer Award, ICSE Shadow PC	2025
Distinguished Artifact Award, CCS	2025

The Estus H. and Vashti L. Magoon Outstanding Research Excellence Award	2025
ACM SIGSOFT CAPS Travel Grant (ASE'24)	2024
Future Leaders for Responsible AI, the Michigan Institute for Data Science (MIDAS)	2024
ACM SIGSOFT CAPS Travel Grant (ICSE'23)	2023
Purdue Graduate Student Government and the Graduate School Travel Grant (ICSE'23)	2023
ACM SIGSOFT CAPS Travel Grant (ESEC/FSE'22)	2022
Study Abroad Fellowship, Southeast University	2019
Second prize, Vision Guided Robot Competition, Southeast University	2019
Distinction Award, Southeast University	2018
Third prize, Structural Innovation Invitation Competition, Southeast University	2017

SERVICES

PC Member, International Conference on Software Engineering (<i>ICSE</i>)	2027
PC Member, Industry Track, International Conference on Software Maintenance and Evolution. (<i>ICSME</i>)	2026
PC Member, Machine Learning and Security Track, Computer and Communications Security (<i>CCS</i>)	2026
Shadow PC Member, International Conference on Software Engineering (<i>ICSE</i>)	2026
PC Member, International Conference on Technical Debt (<i>TechDebt</i>)	2026
PC Member, ACM Workshop on Software Supply Chain Offensive Research and Ecosystem Defenses (<i>SCORED</i>)	2025
Reviewer, ACM Transactions on Software Engineering and Methodology (<i>TOSEM</i>)	2025
Artifact Evaluation PC Member, International Conference on Software Engineering (<i>ICSE</i>)	2025
Shadow PC Member, International Conference on Software Engineering (<i>ICSE</i>)	2025
Junior PC Member, International Conference on Mining Software Repositories (<i>MSR</i>)	2025
Junior PC Member, International Conference on Technical Debt (<i>TechDebt</i>)	2025
Sub-Reviewer: USENIX Security'26, FSE'25, USENIX Security'25, ICSE'25, JSS, ISSTA'24, LCTES'23, ESEC/FSE'23, ASE'22	2022 - 2024

GRANT WRITING AND EXTERNAL FUNDING

[1] Unrestricted Gift: Typosquat Detection in Open-Source Ecosystems

PI: James C. Davis
Socket, Inc.
2025. \$20,000.

[2] Cisco: Trustworthy Re-use of Pre-Trained Neural Networks

PI: James C. Davis, Yung-Hsiang Lu
Contract with Cisco
2022–2023. \$179,237.

[3] Unrestricted gift to support research on machine learning reproducibility

PI: James C. Davis, Yung-Hsiang Lu
Google, LLC
2020. \$80,000 + \$20,000.

[4] Under review: NSF-SaTC, Collaborative proposal between Purdue (PI: James Davis), Brown (PI: Vasileios Kemerlis), and Columbia (PI: Junfeng Yang)

2025

[5] In preparation: NSF-SHF (PI: James C. Davis)

2025

[6] Rejected: DARPA (PI: James C. Davis)

2024

PROFESSIONAL MEMBERSHIPS

Member, OWASP AIBOM Project

Member, SPDX AI and Dataset Team

Member, Institute of Electrical and Electronics Engineers (IEEE)

Member, Association for Computing Machinery (ACM)