Agrim Sachdeva

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EDUCATION

Doctor of Philosophy (PhD)	Major: Management Information Systems Minor: Data Science	Indiana University	2019 - 2024 (expected)
Master of Science (MS)	Major: Information Systems	New Jersey Institute of Technology	2016 - 2018
Bachelor of Technology (BTech)	Major: Biotechnology Engineering	Vellore Institute of Technology, India	2012 - 2016

DISSERTATION *(Dissertation Proposal Defended, August 2023)*

Title: Software Development and Artificial Intelligence: A Multi-method Investigation of Vulnerability Introduction Prediction and Code Generation

Committee Members: Prof. Alan Dennis (Chair), Prof. Antino Kim, Prof. Sagar Samtani, Prof. Ernest O'Boyle

Summary: Open-source software (OSS) is vital to the economy. The security of OSS is paramount since the exploitation of software vulnerabilities can comprise the confidentiality, integrity, and availability of systems, and cause significant financial and reputational damage to firms. Current approaches are reactive, i.e., they detect vulnerabilities after they have been introduced. Therefore, research and industry aim to proactively manage cyber threats, with controls such as targeted security awareness training, which can be enabled by the ability to predict the introduction of vulnerabilities. Another key issue for OSS and software development is producing high-quality code. The ability of Large Language Models (LLMs) to produce human-like code and documentation raises important questions about the ownership of the generated content. While the question of legal ownership is still under debate, psychological ownership is an important aspect that warrants study, with important implications for the stewardship of projects and code. Using a computational design science approach and a lab experiment respectively, I aim to answer the following questions:

- **How can the introduction of vulnerabilities by users into open-source repositories be predicted?**
- **How does the use of Large Language Models (LLMs) for writing code affect code and developer outcomes, and does psychological ownership serve as an underlying mechanism?**

RESEARCH INTERESTS

Domains: Cybersecurity, Human-AI Collaboration, Enterprise Systems

Methods: Lab and Field experiments, Deep Learning (Deep Graph Representation Learning, Large Language Models), Network Science, Econometrics

PUBLISHED JOURNAL PAPERS

1. A. R. Dennis, A. Lakhiwal, and **A. Sachdeva** (2023). AI Agents as Team Members: Effects on Satisfaction, Conflict, Trustworthiness, and Willingness to Work With. ***Journal of Management Information Systems, 40(2), 307-337.***

JOURNAL PAPERS UNDER REVIEW

1. **A. Sachdeva**, A. Kim, A. R. Dennis, "Taking the Chat out of Chatbot? Collecting User Reviews with Chatbots versus Web Forms," ***Revise and Resubmit for Third Round Review, Journal of Management Information Systems (JMIS)***

2. **A. Sachdeva**, B. Lazarine, H. Zhu, S. Samtani., R. Venkataraman "User Profiling and Vulnerability Introduction Prediction in Social Coding Repositories: A Dynamic Graph Embedding Approach," ***Under First Round Review at Information Systems Research (ISR)***

3. A. Kim, **A. Sachdeva**, A. R. Dennis, "Chat over Search: Self-Service IT Support using Chatbots versus Search Tools," ***Under First Round Review at Production and Operations Management (POM)***

WORKING JOURNAL PAPERS

1. **A. Sachdeva**, A. R. Dennis, E.O. Boyle, J. Field, "The Promise and Peril of Inferred Personality: A Meta-Analysis," ***Preparing for submission to Journal of Applied Psychology (JAP)***
2. **A. Sachdeva**, H. Bala, "The Pursuit of Happiness: Use of AI-enabled Digital Assistants in Enterprise Systems," ***Preparing for submission to Information Systems Research (ISR)***
3. B. Lazarine, **A. Sachdeva**, H. Zhu, S. Samtani., R. Venkataraman "Identifying Linked Artificial Intelligence Repositories on GitHub: A Graph Self Supervised Learning Approach," ***Preparing for submission to Information Systems Research (ISR)***
4. **A. Sachdeva,** S. Samtani, A. R. Dennis, "Unraveling the Impact of Generative AI on Programming Outcomes: The Role of Psychological Ownership and Task Complexity," ***Data collection, Targeted at Management Information Systems Quarterly (MISQ)***

REFEREED CONFERENCE PROCEEDINGS (* indicates that I was the presenting author)

1. W. Rosengren, **A. Sachdeva**, A. Kim, A. R. Dennis, "Using Chatbots and Digital Humans to Collect Online Reviews," Hawaii International Conference on System Sciences (HICSS), Hawaii, January 2024
2. F. Hildebrandt, A. B. Brendel, **A. Sachdeva**, A. R. Dennis, "Fake it till you make it? – The Influence of a Conversational Agent's Rookie Personality on Users' Satisfaction", International Conference on Information Systems (ICIS), Hyderabad, India, December 2023
3. A. Kathikar, A. Nair, B. Lazarine, **A. Sachdeva**, S. Samtani, "Assessing the Vulnerabilities of the Open-Source Artificial Intelligence (AI) Landscape: A Large-Scale Analysis of the Hugging Face Platform," IEEE Intelligence and Security Informatics (ISI), Charlotte, North Carolina, October 2023
4. ***A. Sachdeva**, B. Lazarine, S. Samtani. H. Zhu, "User Profiling and Vulnerability Introduction Prediction in Social Coding Repositories: A Dynamic Graph Embedding Approach," USENIX Workshop on Cyber Security Experimentation and Test (CSET), Marina del Rey, California, 2023
5. ***A. Sachdeva**, B. Lazarine, R. Dama, S. Samtani, and H. Zhu, "Identifying Patterns of Vulnerability Incidence in Foundational Machine Learning Repositories on GitHub: An Unsupervised Graph Embedding Approach," IEEE ICDM Workshop on Machine Learning for Cybersecurity, Orlando, Florida, 2022
6. Z. Zhong, B. Lazarine, ***A. Sachdeva**, S. Samtani. H. Zhu, "Exploring the Propagation of Vulnerabilities from GitHub Repositories Hosted by Major Technology Organizations," USENIX Workshop on Cyber Security Experimentation and Test (CSET), Virtual, 2022
7. ***A. Sachdeva**, H. Bala. "Human-AI Hybrids and Individual Performance in the Context of Enterprise Systems Use." AMCIS Salt Lake City, Utah, Virtual, 2020

OTHER REFEREED CONFERENCE PRESENTATIONS (no proceedings; * indicates that I was the presenting author)

1. A. Kathikar, A. Nair, B. Lazarine, **A. Sachdeva**, S. Samtani, "Assessing the Vulnerabilities of the Open-Source Artificial Intelligence (AI) Landscape: A Large-Scale Analysis of the Hugging Face Platform," AI Village, DEFCON 31, Las Vegas, Nevada, August 2023
2. ***A. Sachdeva**, B. Lazarine, S. Samtani. H. Zhu, "Personalized and Proactive Developer Security Awareness Training: A Dynamic Graph Embedding Approach", UCAR SEA's Improving Scientific Software Conference, Boulder, Colorado, April 2023
3. ***A. Sachdeva**, B. Lazarine, S. Samtani. H. Zhu, "User Profiling for Cybersecurity," Workshop on Data Science, INFORMS 2022, Indianapolis, Indiana, October 2022

4. ***A. Sachdeva**, H. Bala, "Conversational Assistants and Task Types in Enterprise Systems," SIG AIAA Workshop on Artificial Intelligence (AI) and Human Interaction, AMCIS 2022, Minnesota, August 2022

5. ***A. Sachdeva**, A. Kim, A. Dennis, "Eliciting Quality Reviews Using Conversational AI," INFORMS 2020 (Virtual), November 2020

TEACHING EXPERIENCE

1. Instructor, S326, Web and Social Media Analytics, Indiana University, Spring 2022
   Class Size: 36, Instructor Rating: 6.18/ 7

2. Instructor, S326, Web and Social Media Analytics, Indiana University, Fall 2021
   Class Size: 31, Instructor Rating: 6.1/ 7

DOCTORAL CONSORTIA

1. International Conference on Information Systems (ICIS), *Hyderabad, India, 2023*
2. Americas Conference on Information Systems (AMCIS), *Panama City, Panama, 2023*
3. Americas Conference on Information Systems (AMCIS), *Minneapolis, Minnesota, 2022*

PROFESSIONAL SERVICE

1. Ad-hoc Reviewer for Journals:
   - Electronic Commerce Research (ECR)
   - Journal of Management Information Systems (JMIS)
2. Ad-hoc Reviewer for Conferences:
   - Hawaii International Conference of System Sciences (HICSS), 2023, 2022, 2021
   - Conference on Information Systems and Technology (CIST), 2022
   - International Conference on Information Systems (ICIS), 2022, 2021, 2020
   - Pacific Asia Conference on Information Systems (PACIS), 2021
   - Workshop on Information Technologies And Systems (WITS), 2020
   - Americas Conference on Information Systems (AMCIS), 2020
3. Program Committee Member, INFORMS Workshop on Data Science, 2023
4. Officer, Kelley School of Business Doctoral Student Association (DSA), 2020-2023
5. Volunteer, Americas Conference on Information Systems (AMCIS), 2023, 2022

AWARDS AND RECOGNITION

1. Harry Kelsey, Jr. Doctoral Fellowship, Kelley School of Business, 2023
2. Nominated for the Panschar AI Teaching Award, Kelley School of Business, 2023
3. Alan Dennis Fellowship, Kelley School of Business, 2022
4. Dean's Fellowship, Kelley School of Business, Indiana University, 2019
5. Class Valedictorian and Student Speaker at Commencement, New Jersey Institute of Technology, 2018

PROFESSIONAL AFFILIATIONS AND SOCIETIES

1. Association for Information Systems (AIS), Member
2. Institute for Operations Research and the Management Sciences (INFORMS), Member
3. Institute of Electrical and Electronics Engineers (IEEE), Member

PROFESSIONAL CERTIFICATIONS

1. **Certified Information Systems Security Professional (CISSP)**, June 2023
2. **Harvard Business School CORe: Credential of Readiness**, HBX, December 2018
3. **IT Service Management, IT Infrastructure Library (ITIL) Foundation Certification**, June 2018

PROFESSIONAL DEVELOPMENT PARTICIPATION: WORKSHOPS AND TRAINING

1. NSF Cybersecurity Summit, Bloomington IN, 2022
2. MISQ Author Development Workshop, Virtual, 202

3. Global Big Data Conference Natural Language Processing Workshop, May 10 – May 15, 2021
4. Systematic Reviews and Meta-Analysis in R, Ernest O' Boyle, CARMA, June 8 – 10, 2021

INDUSTRY EXPERIENCE

1. **Programmer Analyst**, New Jersey Institute of Technology, December 2017 – July 2019
2. **Software Developer**, New Jersey Institute of Technology, September 2016 - December 2017

RELEVANT TECHNOLOGY SKILLS

Statistical Software: R, Python (stats and ML packages), STATA, SPSS
Data mining tools: RapidMiner, SPSS Modeler, WEKA, sci-kit-learn
Deep learning toolkits: PyTorch, PyTorch Geometric, TensorFlow, Keras, Stellargraph
Programming Languages: Java, Groovy, C#, Python
Databases and Analytics: No-SQL Databases, MS SQL Server, Oracle SQL, PL/SQL, IBM Cognos, Tableau
Web Development: Groovy/Grails, Ruby/Rails, ASP.NET Core, Node.js, AngularJS, JavaScript, jQuery, Bootstrap

REFERENCES

1. **Alan R. Dennis**
   Professor of Information Systems
   John T. Chambers Chair of Internet Systems
   Operations & Decision Technologies
   Kelley School of Business, Indiana University
   ardennis@indiana.edu
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2. **Antino Kim**
   Associate Professor and Grant Thornton Scholar
   Operations & Decision Technologies
   Kelley School of Business, Indiana University
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3. **Sagar Samtani**
   Assistant Professor and Weimer Faculty Fellow
   Director, Kelley's Data Science and Artificial Intelligence Lab (DSAIL)
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