Jaganmohan Chandrasekaran Ph.D.

Research Assistant Professor
Sanghani Center for Artificial Intelligence and Data Analytics
Virginia Tech

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RESEARCH INTERESTS

My research is at the intersection of software engineering and artificial intelligence. My work addresses the test and evaluation challenges in AI-enabled software systems by adapting established software testing principles and developing novel methodologies to evaluate unique characteristics of AI-enabled software systems. My work spans test and evaluation of machine learning algorithms, deep neural network models, and large language models, creating test methods and frameworks that address the challenges each technology presents. Through my research, I contribute to the development of methods, frameworks, and metrics for systematic assessment of AI-enabled software systems, enabling reliable and trustworthy AI deployment across diverse applications. Additionally, I am exploring how AI techniques can enhance traditional software testing practices, particularly through LLM-augmented test generation.

EDUCATION

2015.08 - 2021.08 **Ph.D. in Computer Science**
The University of Texas at Arlington, TX, USA
Advisor: Dr. Jeff (Yu) Lei
Dissertation: Testing Artificial Intelligence-Based Software Systems

2013.08 - 2015.08 **M.S. in Computer Science**
The University of Texas at Arlington, TX, USA
Advisor: Dr. Jeff (Yu) Lei
Thesis: Evaluating the effectiveness of BEN in localizing different types of software fault

2004.09 - 2008.04 **B.Tech. in Information Technology**
Anna University, Chennai, India

PROFESSIONAL EXPERIENCE

2024 - Present **Research Assistant Professor**, Virginia Tech

2024 - Present **Working Group Participant,** The Center for AI Standards and Innovation, NIST
Contributed to university's successful application for institutional participation
Active participation in Working Group #3: Capability Evaluations, and Zero drafts policy project

2021 - 2024 **Postdoctoral Associate - AI**, Virginia Tech

2021 **Research Associate**, Computer Science and Engineering, UT Arlington

2021 **Summer Dissertation Fellow**, Computer Science and Engineering, UT Arlington

2020 - 2021 **Graduate Research Assistant**, Computer Science and Engineering, UT Arlington

2015 - 2020 **Graduate Teaching Assistant**, Computer Science and Engineering, UT Arlington

2014 - 2015 **Graduate Teaching Assistant**, Computer Science and Engineering, UT Arlington

2009 - 2012 **Analyst Programmer**, India/USA

AWARDS, FELLOWSHIPS, & GRANTS

Awards

2024 **2024 Publication Award - International Test and Evaluation Organization (ITEA)**
Testing Machine Learning: Best Practices for the Life Cycle published in Naval Engineers Journal

2018 **Outstanding Graduate Teaching Assistant (Finalist)**
Dept. of Computer Science, UT Arlington (1 of 2 finalists from 75+ GTAs)

Fellowships

2015–2021 **STEM Doctoral Fellowship** Dept. of CSE, College of Engineering, UT Arlington

2021 **Summer Dissertation Fellowship** *Graduate School, UT Arlington*
1 of 5 recipients from Dept. of Computer Science
Competitive Fellowship Award Amount : $7,000

Research Grants / Contracts

2024–2025 **DoD/Department of Test & Evaluation (DoTE)**
Role - Senior Personnel - (Share: $212,000)
Responsible for Post Deployment T&E for ML and LLM T&E
Total Award: $3.5 million, PI: Dr. Laura Freeman

2024–2024 **DoD/Department of Test & Evaluation (DoTE)**
Role - Senior Personnel - Developing AI Test Harness
Total Award: $670,000, PI: Dr. Laura Freeman

2023–2024 **DoD/Department of Test & Evaluation (DoTE)**
Role - Senior Personnel - Responsible for T&E of ML - Best Practices
PI: Dr. Laura Freeman

2021 **College of Engineering/UT Arlington**
Role - Co-PI - Research Experience for Undergraduates (REU) Grant
Total Award: $2000, PI: Dr. Jeff (Yu) Lei

Travel Grants

2020 **Dean's Travel Grant** *College of Engineering, UT Arlington [Did not travel due to SARS-CoV-2]*

2016 **Dean's Travel Grant** *College of Engineering, UT Arlington*

PUBLICATIONS

Peer-reviewed Proceedings (* indicate students formally or informally co-mentored)

C.23 Erin Lanus, Brian Lee, Dylan Steburg, **Jaganmohan Chandrasekaran**, and Laura Freeman. CODEX: Testing Machine Learning with the Coverage of Data Explorer Tool. Accepted to IEEE AITest 2025

C.22 **Jaganmohan Chandrasekaran**, Brian Mayer, Heather Frase, Erin Lanus, Patrick Butler, Stephen Adams, Jared Gregersen, Naren Ramakrishnan and Laura Freeman. Test and Evaluation of Large Language Models to Support Informed Government Acquistion, 22nd Annual Acquisition Research Symposium and Innovation Summit, May 2025.

C.21 Erin Lanus, Brian Lee, **Jaganmohan Chandrasekaran**, Laura Freeman, M S Raunak, Raghu Kacker and Rick Kuhn. Data Frequency Coverage Impact on AI Performance In 2025 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 258-267, IEEE.

C.20 **Jaganmohan Chandrasekaran**, Ankita Ramjibhai Patel, Erin Lanus, and Laura Freeman Evaluating Large Language Model Robustness Using Combinatorial Testing In 2025 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 300-309, IEEE.

C.19 Cho-Ting Lee, Andrew Nesser, Shengzhe Xu, Jay Katyan, Patrick Cross, Sharanya Pathakota, Marigold Norman, John Simeone, **Jaganmohan Chandrasekaran**, and Naren Ramakrishnan. Can an LLM find its way around a Spreadsheet? In 2025 IEEE/ACM 47th International Conference on Software Engineering (ICSE), Ottawa, ON, Canada, 2025, IEEE Computer Society

C.18 **Jaganmohan Chandrasekaran**, Erin Lanus, Tyler Cody, Laura Freeman, Raghu N. Kacker, M S Raunak and D.Richard Kuhn. Leveraging Combinatorial Coverage in the Machine Learning Product Lifecycle. In 2024 IEEE Computer, 57(6), pp 16 - 26

C.17 D.Richard Kuhn, M S Raunak, Raghu N. Kacker, **Jaganmohan Chandrasekaran**, Erin Lanus, Tyler Cody, and Laura Freeman. Assured Autonomy through Combinatorial Methods. In 2024 IEEE Computer, 57(5), pp 86 - 90.

C.16 **Jaganmohan Chandrasekaran**, Tyler Cody, Nicola McCarthy, Erin Lanus, Laura Freeman, and Kristen Alexander. Testing Machine Learning: Best Practices for the Life Cycle. Naval Engineers Journal, 2024.
International Test and Evaluation Association (ITEA) 2024 Publications Award.

C.15 Nicola McCarthy, Tyler Cody, **Jaganmohan Chandrasekaran**, Erin Lanus, Laura Freeman, Kristen Alexander, and Sandra Hobson. Key Steps to Fielding Combat Credible AI-Enabled Systems. Naval Engineers Journal, 2024

C.14 Krishna Kadhka*, **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. A Combinatorial Approach to Hyperparameter Optimization. In the IEEE/ACM 3rd IEEE International Conference on AI Engineering (CAIN), pp. 140-149, 2024.
Distinguished paper Award Candidate

C.13 Krishna Kadhka*, **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. Synthetic Data Generation Using Combinatorial Testing and Variational Autoencoder. In 2023 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 228-236, IEEE.

C.12 Yingjie Wang*, **Jaganmohan Chandrasekaran**, Flora Haberkorn*, Yan Don*, Munisamy Gopinath, and Feras Batarseh. DeepFarm: AI-Driven Management of Farm Production using Explainable Causality. In 29th Annual Software Technology Conference (STC), pp. 27-36, IEEE.

C.11 Sunny Shree*, **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. DeltaExplainer: A Software Debugging Approach to Generating Counterfactual Explanations. In 2022 IEEE International Conference On Artificial Intelligence Testing (AITest), pp. 103-110, IEEE.

C.10 **Jaganmohan Chandrasekaran**, Feras Batarseh, Laura Freeman, Raghu Kacker, M S Raunak and D. Richard Kuhn. Enabling AI Adoption through Assurance. In The International FLAIRS Conference Proceedings 2022, Vol. 35. (Tutorial - Extended abstract).

C.9 Ankita Ramjibhai Patel*, **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. A Combinatorial Approach to Fairness Testing of ML Models. In 2022 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 94-101, IEEE.

C.8 **Jaganmohan Chandrasekaran**, Ankita Ramjibhai Patel, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. Evaluation of T-Way Testing of DNNs in Autonomous Driving Systems. In 2021 IEEE International Conference On Artificial Intelligence Testing (AITest), pp. 17-18, IEEE.

C.7 **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. A Combinatorial Approach to Explaining Image Classifiers. In 2021 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 35-43, IEEE.

C.6 **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. A Combinatorial Approach to Testing Deep Neural Network-based Autonomous Driving Systems. In 2021 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 57-66, IEEE.

C.5 **Jaganmohan Chandrasekaran**, Huadong Feng, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. Effectiveness of volumetric dataset reduction in testing machine learning algorithms. In 2020 IEEE International Conference On Artificial Intelligence Testing (AITest), pp. 133-140, IEEE.

C.4 Huadong Feng, **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. A Method-Level Test Generation Framework for Debugging Big Data Applications. In 2018 IEEE International Conference on Big Data (Big Data), pp. 221-230, IEEE.

C.3 **Jaganmohan Chandrasekaran**, Huadong Feng, Yu Lei, D. Richard Kuhn and Raghu N.Kacker. Applying Combinatorial Testing to Data Mining Algorithms. In 2017 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 253-261, IEEE.

C.2 **Jaganmohan Chandrasekaran**, Laleh Sh Ghandehari, Yu Lei, D. Richard Kuhn and Raghu N.Kacker. Evaluating the effectiveness of BEN in localizing different types of software fault. In 2016 IEEE Ninth International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 26-34, IEEE.

C.1 Laleh Sh Ghandehari, **Jaganmohan Chandrasekaran**, Yu Lei, D. Richard Kuhn and Raghu N.Kacker. BEN: A combinatorial testing-based fault localization tool. In 2015 IEEE Ninth International Conference on Software Testing, Verification and Validation Workshops (ICSTW), pp. 1-4, IEEE.

Manuscripts Under Preparation/Review

M.4 **Jaganmohan Chandrasekaran**, Erin Lanus, Heather Frase, and Laura Freeman. Conceptualizing Test and Evaluation of Large Language Models. The Sixth annual AI4SE & SE4AI Research and Application Workshop, George Washinton University Trustworthy Initiative, Washington DC.(In preparation)

M.3 Erin Lanus, **Jaganmohan Chandrasekaran**, and Laura Freeman. Systems Engineering Framework for Test and Evaluation of Large Language Models. Abstract for the 2025 Emerging Technologies for Defense Conference and Exhibition. (Under Review)

M.2 Krishna Khadka*, **Jaganmohan Chandrasekaran**, Yu Lei, Raghu Kacker, and D.Richard Kuhn. A Combinatorial Approach to Synthetic Data Generation. (Under Review - Submitted to a Journal)

M.1 Padmaksha Roy, **Jaganmohan Chandrasekaran**, Erin Lanus, Laura Freeman, and Jeremy Werner. A Survey of Data Security: Practices from Cybersecurity and Challenges of Machine Learning. (Under Revision - Submitted to a Journal)

Other Publications

O.2 **Jaganmohan Chandrasekaran.** Testing Artificial Intelligence-based software systems. Dissertation & Theses University of Texas - Arlington; ProQuest Dissertation & Theses Global. (Dissertation)

O.1 **Jaganmohan Chandrasekaran.** Evaluating The Effectiveness Of BEN In Localizing Different Types Of Software Fault. Dissertation & Theses University of Texas - Arlington; ProQuest Dissertation & Theses Global. (Thesis)

Book Chapters

B.1 Chapter 1 - An Introduction to AI Assurance by Feras Batarseh, **Jaganmohan Chandrasekaran,** Laura Freeman AI Assurance: Towards Trustworthy, Explainable, Safe and Ethical AI, Academic Press, 2022.

Posters

PST.4 Rick Kuhn, M S Raunak, Raghu Kacker, **Jaganmohan Chandrasekaran**, Erin Lanus, Tyler Cody, and Laura Freeman Measurements to Improve AI/ML Training Data Sets , The Twenty-Fourth Annual High Confidence Software And Systems Conference (HCSS), May 2024.

PST.3 Luis Pol*, Brian Lee*, Anika Thatavarthy*, Erin Lanus, Justin Kauffman, and **Jaganmohan Chandrasekaran.** Combinatorial Testing to Measure Machine Learning Dataset Differences, Virginia Tech National Security Institute Colloquium, April 2023.

PST.2 Feras Batarseh, **Jaganmohan Chandrasekaran,** Yan Dong*, Gopinath Munisamy, and Susan E. Duncan. Measuring the Causal Effects of Outliers in Agricultural Supply Chains Using AI, Envisioning 2050 in the Southeast: AI-Driven Innovations in Agriculture, Auburn University, 2022.

PST.1 Edrik Aguilera*, Sunny Shree* **Jaganmohan Chandrasekaran,** and Yu Lei A Software Fault Localization approach to Explainable Artificial Intelligence, UTA Innovation Day, April 2021.

RESEARCH TALKS

2025 Test and Evaluation of Large Language Models - Deep Dive with Research Sponsor, DoD/DoTE

Test and Evaluation of Large Language Models to Support Informed Government Acquisition, 22nd Annual Acquisition Research Symposium & Innovation Summit, (Co-presenter)

Evaluating Large Language Model Robustness using Combinatorial Testing - Deep Dive with Research Sponsor, DoD/DoTE

2024 Application of Combinatorial Testing in Testing Machine Learning Systems, A workshop on Combinatorial Testing for AI-Enabled Systems, Arlington , Virginia

Large Language Models - Test & Evaluation Considerations, Director Operational Test and Evaluation (DOT&E) - AI working group

2023 **Invited Panelist** - Designing Autonomous/AI/ML Systems for Assurance, Second IEEE International Workshop on Workshop on Assured Autonomy, AI and Machine Learning (WAAM)

2022 **Tutorial -** Enabling AI adoption through Assurance, 35th FLAIRS Conference, USA

Speed Briefing on AI Assurance , Inaugural CCI Symposium,USA

2021 Towards Building High Quality AI-Based Systems: An exploration between Software Engineering and AI, Virginia Tech, USA

Evaluation of T-Way Testing of DNNs in Autonomous Driving Systems, 3rd IEEE International Conference on Artificial Intelligence Testing - Virtual

A Combinatorial Approach to Explaining Image Classifiers, IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW) - Virtual

A Combinatorial Approach to Testing Deep Neural Network-based Autonomous Driving Systems, IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW)- Virtual

2020 Effectiveness of dataset reduction in testing machine learning algorithms, 2nd IEEE International Conference on Artificial Intelligence Testing - Virtual

2016 Evaluating the Effectiveness of BEN in Localizing Different Types of Software Fault, IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), Chicago, USA

TEACHING EXPERIENCE

Instructor

Spring 2025 **Co-Instructor - DATAWorks 2025,** *Workshop on Combinatorial Testing for AI-Enabled Systems*

Spring 2024 **[CMDA 4984] Data Security - Guest Lecturer,** *Undergraduate Course*

Summer 2022 **CCI Cybercamp - Instructor ,** Introduction to AI Assurance, *One day workshop*

Summer 2018 **[CSE 4321] Software Testing - Guest Lecturer**, *Undergraduate course*

Summer 2017 **[CSE 5321] Software Testing - Guest Lecturer**, *Graduate course*

Graduate Teaching Assistant

Summer 2020	**[CSE 5321] Software Testing**, *Graduate course*
Spring 2020	**[CSE 6321] Advanced Automation Testing**, *Graduate course*
Fall 2019	**[CSE 6321] Advanced Automation Testing**, *Graduate course*
Summer 2019	**[CSE 5321] Software Testing**, *Graduate course*
Spring 2019	**[CSE 6321] Advanced Automation Testing**, *Graduate course*
Fall 2018	**[CSE 6321] Advanced Automation Testing**, *Graduate course*
Summer 2018	**[CSE 5321] Software Testing**, *Graduate course*
Spring 2018	**[CSE 5321] Software Testing**, *Graduate course*
Fall 2017	**[CSE 4321] Software Testing**, *Undergraduate course*
Summer 2017	**[CSE 5321] Software Testing**, *Graduate course*
Spring 2017	**[CSE 5321] Software Testing**, *Graduate course*
Fall 2016	**[CSE 4321] Software Testing**, *Undergraduate course*
Summer 2016	**[CSE 4321] Software Testing**, *Undergraduate Course*
Spring 2016	**[CSE 3311] Object-Oriented Software Engineering**, *Undergraduate course*
Fall 2015	**[CSE 4361] Software Design Patterns**, *Undergraduate course*
Spring 2015	**[CSE 5328] Software Team Project II**, *Graduate course*
Fall 2014	**[CSE 5325] Software Engineering II**, *Graduate course*

MENTORING EXPERIENCE

Ph.D.	Nazmul Kabir Sikder, Virginia Tech, *2022* Yingjie (Chelsea) Wang, Virginia Tech, *2022* Krishna Khadka, UT Arlington, *2022 - 2023*
Masters	Muhammad Shehryar Khan, Virginia Tech, *2025 - Current* Divakara Rao Annepu, Virginia Tech, *2024* Luis Pol, Virginia Tech, *2023* Flora Haberkorn, Virginia Tech, *2022* Yan Dong, Virginia Tech, *2022* Weiting Li, Virginia Tech, *2022*
Bachelors	Patrick Cross, Virginia Tech, *2024* Aarush Patil, Virginia Tech, *2024* Anika Thatavarthy, Virginia Tech, *2023* Edrik Aguirela, UT Arlington, *2020 - 2021* Christian Teeples, UT Arlington, *2020* Tiffany Isabel Frias, UT Arlington, *2020*

SERVICE

Policy Engagement

2024 - Current	**Contributor, Working Group # 3 - Capability Evaluations** The Center for AI Standards and Innovation, NIST

Technical Program Committee

Serving both as a Program Committee Member and as a Reviewer unless otherwise specified

2025	**1st Workshop on Quality Evaluation of ML-based Software Systems**
	7th IEEE International Conference on Artificial Intelligence Testing *(AI Test)*
	18th IEEE International Conference on Software Testing, Verification and Validation *(ICST) - Poster track*
2024	**1st International Workshop on Testing and Evaluation of Large Language Models**
	3rd International Conference on AI Engineering *(CAIN)*
	16th International Conference on Advances in System Testing and Validation Lifecyle
	17th IEEE International Conference on Software Testing, Verification and Validation *(ICST) - Poster track*
	6th IEEE International Conference on Artificial Intelligence Testing *(AI Test)*
	24th IEEE International Conference on Software Quality, Reliability, and Security - Special Track on Artificial Intelligence Testing *(QRS)*
2023	**30th Annual IEEE Software Technology Conference** *(STC)*
	5th IEEE International Conference on Artificial Intelligence Testing *(AI Test)*
	16th IEEE International Conference on Software Testing, Verification and Validation *(ICST) - Poster track*
2022	**1st IEEE International Workshop on Assured Autonomy, Artificial Intelligence and Machine Learning** *(WAAM) - Served on the Program Committee*
	29th Annual IEEE Software Technology Conference *(STC)*
2022	**4th IEEE International Conference on Artificial Intelligence Testing** *(AI Test)*
2021	**16th International Conference on Software Technologies** - *Auxillary Reviewer*
2020	**15th International Conference on Software Technologies** - *Auxillary Reviewer*
	35th International Conference on Automated Software Engineering (ASE) - *Sub Reviewer*

Journal Reviewer

2025	**IEEE Computer**
2025	**IEEE Transactions on Software Engineering**
2024	**IEEE Reliability Magazine**
2024	**IEEE Computer Special Issue - AI Failures: Causes, Implications, and Prevention**
2023	**Software Quality Journal**

Organizing Committee

2025	**Co-organizer,** *Combinatorial Testing for AI-Enabled Systems - DATAWorks 2025 .*
2024	**Co-organizer,** *Workshop on Combinatorial Testing for AI-enabled software systems (CT4AIES).*
2023	**Publicity Chair,** *ICST 2023*

Proposal Reviewer

2022	**Grant Proposal Reviewer,** *Commonwealth Cyber Initiative (CCI)*

REFERENCES

Provided on request