Jaganmohan Chandrasekaran **Ph.D. (he/him)**

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, where I focus on addressing the test and evaluation challenges throughout the AI/ML lifecycle. My research aims to enable practitioners to develop and maintain trustworthy AI/ML systems.

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 - **Research Assistant Professor**, Virginia Tech
2023 - 2024 **Postdoc Associate - AI**, National Security Institute, Virginia Tech
2021 - 2023 **Postdoc Associate - AI**, Commonwealth Cyber Initiative, 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**, Syntel Inc., India/USA

PUBLICATIONS

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

C.18 **Jaganmohan Chandrasekaran**, Tyler Cody, Nicola McCarthy, Erin Lanus, Laura Freeman, and Kristen Alexander Testing Machine Learning: Best Practices for the Life Cycle. (In Press)

C.17 Nicola McCarthy, Tyler Cody, **Jaganmohan Chandrasekaran**, Erin Lanus, Laura Freeman, Kristen Alexander, and Sandra Hobson. Operational and Live Fire Test and Evaluation Framework for AI-enabled systems. (In Press)

C.16 D.Richard Kuhn, M S Raunak, Raghu N. Kacker, **Jaganmohan Chandrasekaran**, Erin Lanus, Tyler Cody, and Laura Freeman. Assured Autonomy through Combinatorial Methods. (In Press)

C.15 **Jaganmohan Chandrasekaran**, Erin Lanus, Tyler Cody, Laura Freeman, Raghu N. Kacker, M S Raunak and D.Richard Kuhn. Leveraging Combinatorial Coverage in ML Product Lifecycle. (In Press)

C.14 Krishna Kadhka*, **Jaganmohan Chandrasekaran**, Yu Lei, Raghu N.Kacker and D. Richard Kuhn. A Combinatorial Approach to Hyperparameter Optimization. In 2024 IEEE International Conference on AI Engineering (Accepted)

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 Review / Preparation

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

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 Review)

Dissertation/Thesis

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

DT.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.

Reports

R.1 **Jaganmohan Chandrasekaran,** Tyler Cody, Nicola McCarthy, Erin Lanus, and Laura Freeman. Test & Evaluation Best Practices for Machine Learning-Enabled Systems. arXiv:2310.06800

Posters

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.

TEACHING EXPERIENCE

Instructor

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 - Current*
Masters	Luis Pol, Virginia Tech, *2023* Flora Haberkorn, Virginia Tech, *2022* Yan Dong, Virginia Tech, *2022* Weiting Li, Virginia Tech, *2022*
Bachelors	Anika Thatavarthy, Virginia Tech, *2023* Edrik Aguirela, UT Arlington, *2020 - 2021* Christian Teeples, UT Arlington, *2020* Tiffany Isabel Frias, UT Arlington, *2020*

RESEARCH TALKS

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	Enabling AI adoption through Assurance (Tutorial), 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

AWARDS, FELLOWSHIPS, & GRANTS

2021	**Summer Dissertation Fellow,** *Graduate School, UT Arlington [Fellowship Amount : $ 7000.00]*
	Research Experience for Undergraduates (ReU) Grant, *College of Engineering, UT Arlington [Grant Amount : $ 2000.00]*
2020	**Dean's Travel Grant,** *College of Engineering, UT Arlington [Did not travel due to Sars-COV2]*
2018	**Finalist - Outstanding Graduate Teaching Assistant** *Dept. of CSE, UT Arlington*
2016	**Dean's Travel Grant,** *College of Engineering, UT Arlington*
2015 - 2021	**STEM Doctoral Fellowship,** *Dept. of CSE, College of Engineering, UT Arlington*

SERVICE

Program Committees

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

2024	**3rd International Conference on AI Engineering** *(CAIN)*
	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*
	Software Quality Journal - *Reviewer for the journal*
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)*
	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*

Organizing Committees

2023 **Publicity Chair,** *ICST 2023*

Others

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

REFERENCES

Provided on request