

# Jaganmohan Chandrasekaran

POSTDOCTORAL ASSOCIATE · VIRGINIA TECH

900 N. Glebe Road, Arlington, VA 22203

✉ jagan@vt.edu | 🏠 <https://cjaganmohan.github.io>

## Education

### The University of Texas at Arlington

Arlington, USA

PH.D. IN COMPUTER SCIENCE

2015-2021

- Dissertation - *Testing Artificial Intelligence-Based Software Systems*
- Advisor: Dr. Jeff Lei

### The University of Texas at Arlington

Arlington, USA

M.S. IN COMPUTER SCIENCE

2013 - 2015

- Thesis - *Evaluating the effectiveness of BEN in localizing different types of software fault*
- Advisor: Dr. Jeff Lei

### Anna University

Chennai, India

B.TECH IN INFORMATION TECHNOLOGY

2004 - 2008

## Research Interests

My research interest is at the intersection of Software Engineering and Artificial Intelligence. I am motivated to address the engineering challenges in developing and transforming an AI-enabled software system from a prototype to a reliable, trustworthy product that is deployable in the real world.

**Software Engineering for AI-enabled Software Systems:** Test & Evaluation challenges in AI/ML pipeline - Test set generation, drift detection and mitigation, regression testing

**AI Assurance:** Explainable AI, Fairness, Trustworthy AI/ML

## Professional Experience

2023- Present	<b>Postdoctoral Associate - AI</b> , National Security Institute, Virginia Tech
2021- 2023	<b>Postdoctoral Associate - AI</b> , Commonwealth Cyber Initiative, Virginia Tech
2021	<b>Research Associate</b> , Computer Science and Engineering, The University of Texas at Arlington
2021	<b>Summer Dissertation Fellow</b> , Computer Science and Engineering, The University of Texas at Arlington
2020 - 2021	<b>Graduate Research Assistant</b> , Computer Science and Engineering, The University of Texas at Arlington
2015 - 2020	<b>Graduate Teaching Assistant</b> , Computer Science and Engineering, The University of Texas at Arlington
2014 - 2015	<b>Graduate Teaching Assistant</b> , Computer Science and Engineering, The University of Texas at Arlington
2009 - 2012	<b>Analyst Programmer</b> , Syntel Inc., India/USA

## Publications

### PEER-REVIEWED PROCEEDINGS

Krishna Khadka, 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.

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

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.

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)

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.

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.

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.

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.

Jaganmohan Chandrasekaran, Haudong 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.

Haudong 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.

Jaganmohan Chandrasekaran, Haudong 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.

Jaganmohan Chandrasekaran, Laleh Sh Ghandehari, Yu Lei, Raghu Kacker, and D. Richard Kuhn. ***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.

Laleh Sh Ghandehari, Jaganmohan Chandrasekaran, Yu Lei, Raghu Kacker, and D. Richard Kuhn. ***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.

## IN REVIEW

Padmaksha Roy, Jaganmohan Chandrasekaran, Erin Lanus, and Laura Freeman ***A Survey of Cybersecurity and Machine Learning Aspects of Data Security*** (Under Sponsor Review).

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*** (Under Review).

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

## DISSERTATION/THESIS

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

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

*An Introduction to AI Assurance*. Feras A. Batarseh, Jaganmohan Chandrasekaran, Laura Freeman  
**Book: AI Assurance: Towards Trustworthy, Explainable, Safe and Ethical AI**, Academic Press, 2022.

## POSTERS

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.

Feras A. 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.

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

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Summer 2022	CCI Cybercamp Instructor, Introduction to AI Assurance	Undergrad
Summer 2020	Graduate Teaching Assistant, CSE 5321: Software Testing	Graduate
Spring 2020	Graduate Teaching Assistant, CSE 6321: Special Topics - Advanced Software Testing	Graduate
Fall 2019	Graduate Teaching Assistant, CSE 6321: Special Topics - Advanced Software Testing	Graduate
Summer 2019	Graduate Teaching Assistant, CSE 5321: Software Testing	Graduate
Spring 2019	Graduate Teaching Assistant, CSE 6321: Special Topics - Advanced Software Testing	Graduate
Fall 2018	Graduate Teaching Assistant, CSE 6321: Special Topics - Advanced Software Testing	Graduate
Summer 2018	Guest Lecturer, CSE 4321: Software Testing	Undergrad
Summer 2018	Graduate Teaching Assistant, CSE 5321: Software Testing	Graduate
Spring 2018	Graduate Teaching Assistant, CSE 5321: Software Testing	Graduate
Fall 2017	Graduate Teaching Assistant, CSE 4321: Software Testing	Undergrad
Summer 2017	Guest Lecturer, CSE 5321: Software Testing	Graduate
Summer 2017	Graduate Teaching Assistant, CSE 5321: Software Testing	Graduate
Spring 2017	Graduate Teaching Assistant, CSE 5321: Software Testing	Graduate
Fall 2016	Graduate Teaching Assistant, CSE 4321: Software Testing	Undergrad
Summer 2016	Graduate Teaching Assistant, CSE 4321: Software Testing	Undergrad
Spring 2016	Graduate Teaching Assistant, CSE 3311: Object-Oriented Software Engineering	Undergrad
Fall 2015	Graduate Teaching Assistant, CSE 4361: Software Design Patterns	Undergrad
Spring 2015	Graduate Teaching Assistant, CSE 5328: Software Team Project II	Graduate
Fall 2014	Graduate Teaching Assistant, CSE 5325: Software Engineering II	Graduate

## Mentoring

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2022	Md Nazmul Kabir Sikder, Ph.D. Student, Virginia Tech
2022	Yingjie (Chelsea) Wang, Ph.D. Student, Virginia Tech
2022	Flora Haberkorn, M.S. Student, Virginia Tech
2022	Yan Dong, M.S. Student, Virginia Tech
2022	Weiting Li, M.S. Student, Virginia Tech
2022 - Current	Krishna Kadka, Ph.D. Student, UT Arlington
2020 - 2021	Edrik Aguilera, Undergrad - Research Experience for Undergraduate (ReU), UT Arlington
2020	Christian Teeple, Undergrad - Honors Project, UT Arlington
2020	Tiffany Isabel Frias, Undergrad - Honors Project, UT Arlington

## Presentations

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### TALKS

*Enabling AI adoption through Assurance* (Tutorial), 35th FLAIRS Conference, USA, Spring 2022

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

*Evaluation of T-Way Testing of DNNs in Autonomous Driving Systems*, 3rd IEEE International Conference on Artificial Intelligence Testing(AITest), Summer 2021 (Virtual)

*A Combinatorial Approach to Explaining Image Classifiers*. IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), Spring 2021 (Virtual)

*A Combinatorial Approach to Testing Deep Neural Network-based Autonomous Driving Systems*. IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), Spring 2021 (Virtual)

*Effectiveness of dataset reduction in testing machine learning algorithms*. IEEE International Conference on Artificial Intelligence Testing(AITest), Summer 2020 (Virtual)

*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, 2016

## Awards, Fellowships, & Grants

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2021	<b>Summer Dissertation Fellow</b> , Graduate School, UT Arlington	\$ 7,000.00
2021	<b>Grant - Research Experience of Undergraduates</b> , College of Engineering, UT Arlington	\$ 2,000.00
2020	<b>Dean's Travel Grant</b> , College of Engineering, UT Arlington (Didn't travel due to COVID-19 lockdown)	
2018	<b>Finalist - Outstanding Graduate Teaching Assistant</b> , Dept. of CSE, UT Arlington	
2016	<b>Dean's Travel Grant</b> , College of Engineering, UT Arlington	
2015 - 2021	<b>STEM Doctoral Fellowship</b> , UT Arlington	

## Service

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### COMMITTEE

2023	<b>30th Annual IEEE Software Technology Conference</b> , Program Committee
2023	<b>5th IEEE International Conference on Artificial Intelligence Testing</b> , Program Committee
2023	<b>16th IEEE International Conference on Software Testing, Verification and Validation (ICST)</b> , Organizing Committee
2023	<b>16th IEEE International Conference on Software Testing, Verification and Validation (ICST)</b> , Program Committee - Poster track
2022	<b>1st IEEE International Workshop on Assured Autonomy, Artificial Intelligence and Machine Learning</b> , Program Committee
2022	<b>4th IEEE International Conference on Artificial Intelligence Testing</b> , Program Committee

### REVIEWER

- 2023 **30th Annual IEEE Software Technology Conference**, Reviewer
- 2023 **5th IEEE International Conference on Artificial Intelligence Testing**, Reviewer
- 2023 **Software Quality Journal**, Reviewer
- 2023 **16th IEEE International Conference on Software Testing, Verification and Validation (ICST) - Poster Track**, Reviewer
- 2022 **29th Annual IEEE Software Technology Conference**, Reviewer
- 2022 **4th IEEE International Conference on Artificial Intelligence Testing**, Reviewer
- 2021 **16th International Conference on Software Technologies**, Auxillary Reviewer
- 2020 **15th International Conference on Software Technologies**, Auxillary Reviewer
- 2020 **35th IEEE/ACM International Conference on Automated Software Engineering**, Sub-Reviewer

## OTHERS

- 2022 **Commonwealth Cyber Initiative**, Grant Proposal Reviewer

## References

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Provided upon request