

Parth Ganeriwala, Ph.D.

RESEARCH SCHOLAR

ASSIST Research Lab, Florida Institute of Technology
Melbourne, FL 32934

☎ (321) 419-8158 | ✉ ganeriwalaparth@gmail.com | 🌐 parthganeriwala.com | 📱 ParthGaneriwala | 📧 parth-ganeriwala

Summary

Ph.D. in Computer Science (Florida Institute of Technology, 2026) researching formal verification and assurance of learning-enabled, safety-critical autonomous systems, spanning transfer learning, cognitive-architecture verification, and computer vision for aviation. Author of 34 publications (30 accepted, including NASA Formal Methods, IEEE SysCon, AIAA, and CVPR/ICCV workshops) supported by NASA-, DARPA-, and NAVAIR-funded research. Advises graduate and undergraduate researchers on transfer learning and assurance frameworks for autonomous aircraft systems, and serves as an invited reviewer for NeurIPS, ICML, and ICLR.

Education

Florida Institute of Technology

Melbourne, Florida

PH.D. IN COMPUTER SCIENCE: GPA - 4.0/4.0

January 2023 – May 2026

- Research Interests: Formal Methods, Artificial Intelligence, Machine Learning, Deep and Transfer Learning, LLMs and Automation
- *Dissertation: What is Common Knowledge Across Domains? Investigating Shared Representations in Transfer Learning* (Advisor: Dr. Siddhartha Bhattacharyya)
- Honors: **Outstanding Student of the Year** (Honors Convocation 2025); Inducted Member of **Phi Kappa Phi**

Florida Institute of Technology

Melbourne, Florida

M.S. IN COMPUTER SCIENCE: GPA - 4.0/4.0

May 2022 – December 2023

- Core subjects: Artificial Intelligence, Database Systems, Formal Methods, Advanced Software Engineering, Speech Recognition.

Birla Institute of Technology and Science, Pilani

Dubai, United Arab Emirates

B.E. IN COMPUTER SCIENCE: GPA - 3.5/4.0

August 2018 – December 2021

- Thesis: *ERF-CondLaneNet: an Ego Car Lane Detection Framework*

Publications

Why Trust Machine Learning? Evolution of Trustworthiness Debt Leveraging Trustworthiness Attributes

Under Review

KMAL FARABI, A PRITCHETT, M SYNBORSKI, J LIU, M CARROLL, M NAMUKASA, N MANNING, R SEN, MAH KHAN, **P GANERIWALA**, S BHATTACHARYYA, S RAY, S BHUNIA, M MAHMOUD, A HOMAIFAR, P KEBRIA, M PAVONE, M GANAI AND C LIU

AAAI 2027

It Is Not the Model, It Is the Input: Test-Time Input-Space Refinement for Few-Shot Segmentation

Under Review

MAH KHAN, **P GANERIWALA**, A ALVAREZ AND S BHATTACHARYYA

AAAI 2027

Surveying the Landscape of Transfer Learning: Common Knowledge and Beyond

Under Review

P GANERIWALA, N NEOGI AND S BHATTACHARYYA

IEEE Trans on Pattern Analysis and Machine Intelligence

Formalizing Natural Language Specifications for MBSE with an NLP-Based Grammar for Automated System Architecture Generation

Under Review

C CHAMBERS, **P GANERIWALA**, S MUELLER, S BHATTACHARYYA AND C SEN

IEEE Systems Journal

VIROPLEX: A GNN-Driven Assessment of the Pandemic Potential of Zoonotic Bat Viruses

Accepted

A AGNIHOTHRAM, **P GANERIWALA**, AND S BHATTACHARYYA

IEEE ICTAI 2026

Formal Analysis of Stochastic Cognitive Models: A Translation Framework from Soar to PRISM

Accepted

P GANERIWALA, C CHAMBERS, JI LATHROP, S BHATTACHARYYA, J BABAR, S GILBERT, I AMUNDSON, M DORNEICH AND MAH KHAN

NASA Formal Methods 2026

Compositional Reasoning over System Architectures with Integrated Cognitive Model

Accepted

P GANERIWALA, C CHAMBERS, S BHATTACHARYYA, I AMUNDSON, AND J BABAR

IEEE SysCon 2026

Correlation-Threshold Feature Selection for Internet of Things (IoT) Device Identification under Domain Shift

Accepted

A DHANAWADE, **P GANERIWALA**, AND S BHATTACHARYYA

ISAIM 2026

AssistTaxi-v2: A Scalable Dataset for Taxiway/Runway Scene Understanding Under Diverse Conditions	Accepted
P GANERIWALA, MAH KHAN, A ALVAREZ, S BHATTACHARYYA, N NEOGI AND S LEHMAN	AIAA SciTech 2026
Explainable Assurance through Compositional Verification with Cognitive Models	Accepted
P GANERIWALA, C CHAMBERS, S BHATTACHARYYA, AND J BABAR	IEEE RTSS/ESRA 2025
Evaluating LLM Translation for Prompt-Enhanced ACT-R and Soar Models	Accepted
P GANERIWALA, S WU, S BHATTACHARYYA AND F RITTER	BRIMS 2025
Enabling Formal Verification in a Common Model of Cognition	Accepted
P GANERIWALA, M MATSUMURO, F RITTER AND S BHATTACHARYYA	BRIMS 2025
Integrating Reconfigurable Accelerators with Quantum Computing	Accepted
PRATIBHA, P GANERIWALA AND N MAHMUD	IEEE QCE QCore Workshop 2025
Adapt, But Don't Forget: Fine-Tuning and Contrastive Routing for Lane Detection under Distribution Shift	Accepted
MAH KHAN, P GANERIWALA, S LEHMAN, A ALVAREZ, S BHATTACHARYYA AND N NEOGI	ICCV 2COOOL Workshop 2025
AI Driven Differentiation and Quantification of Metal Ions Using ITIES Electrochemical Sensors	Accepted
M AHMED, P GANERIWALA, A SAVVIDOU, N BREEN, S BHATTACHARYYA, P PATHIRATHNA	Journal of Sensor and Actuator Networks 2025
FLAIR: Few-Shot Learning for Grapheme Recognition in Ancient Scripts	Accepted
P GANERIWALA AND D MITRA	CVPR SINT4CH Workshop 2025
Few-Shot Learning for Grapheme Recognition in Ancient Scripts	Accepted
P GANERIWALA AND D MITRA	ACM Journal on Computing and Cultural Heritage 2025
Can Someone Prove Your Operator Won't Get Distracted? A Gentle Introduction to Formal Methods in Human Factors	Accepted
S GILBERT, P GANERIWALA, J LATHROP, A NEWENDORP, S FIEFFER, P WU, I AMUNDSON, C CHAMBERS, A KOHL, S KHAN, M SANAEI, J BABAR, T WANG, D MUSLINER, R GOLDMAN, J GOTTLIEB, E WINER, M DORNEICH AND S BHATTACHARYYA	HFES 2025
Modeling and Formal Analysis of High-Assurance Mixed-Reality Systems	Accepted
I AMUNDSON, J BABAR, H HERENCIA-ZAPANA, S F ROLLINI, B BRUSSEE, P WU, T WANG, D MUSLINER, R GOLDMAN, J GOTTLIEB, A NEWENDORP, A KOHL, S FIEFFER, S KHAN, M SANAEI, M MUSCALA, S GILBERT, E WINER, M DORNEICH, J LATHROP, P GANERIWALA, C CHAMBERS AND S BHATTACHARYYA	AIAA DATC/IEEE DASC 2025
Systems Engineering with Architecture Modeling, Formal Verification and Human Interactions for Learning-Enabled Autonomous Agent	Accepted
P GANERIWALA, R JONES, M MATESSA, S BHATTACHARYYA, J DAVIS, S ROLLINI, H PUROHIT, N NEOGI	INCOSE Systems Journal
Design and Validation of Learning Aware HMI for Learning-Enabled Increasingly Autonomous Systems	Accepted
P GANERIWALA, M MATESSA, S BHATTACHARYYA, R JONES, J DAVIS, P KAUR, S ROLLINI, N NEOGI	IEEE SysCon 2025
Automating Physics-Based Reasoning for SysML Model Validation	Accepted
C CHAMBERS, S MUELLER, P GANERIWALA, S BHATTACHARYYA AND C SEN	IEEE SysCon 2025
Runway vs. Taxiway: Challenges in Automated Line Identification and Notation Approaches	Accepted
P GANERIWALA, A ALVAREZ, A ALQAHTANI, S BHATTACHARYYA, MAH KHAN, N NEOGI	IEEE SysCon 2025
Exploring Machine Learning Engineering for Object Detection and Tracking by Unmanned Aerial Vehicle (UAV)	Accepted
A GUNA, P GANERIWALA, AND S BHATTACHARYYA	IEEE ICMLA 2024
ALINA: Advanced Line Identification and Notation Algorithm	Accepted
MAH KHAN, P GANERIWALA, S BHATTACHARYYA, N NEOGI AND R MUTHALAGU	CVPR VDU Workshop 2024
AssistTaxi: A Comprehensive Dataset for Taxiway Analysis and Autonomous Operations	Accepted
P GANERIWALA, S BHATTACHARYYA, S GUNTHER, B KISH, MAH KHAN, A DHADOTI AND N NEOGI	IEEE ICMLA 2023
Towards Knowledge Extraction and Parsing of XML Metadata for SysML System Architecture Modeling	Accepted
C CHAMBERS, P GANERIWALA, S BHATTACHARYYA, C SEN AND N NUR	IEEE UEMCON 2023

Automated Framework to Extract Software Requirements from Source Code

C MISKELL, R DIAZ, **P GANERIWALA**, K SLHOUB, F NEMBARD

Accepted
ACM NLPir 2023

Assuring Learning-Enabled Increasingly Autonomous Systems (ALEIAS)

N NARAYAN, **P GANERIWALA**, R JONES, M MATESSA, S BHATTACHARYYA, J DAVIS, H PUROHIT AND S ROLLINI

Accepted
IEEE SysCon 2023

IPAssess: A Protocol-Based Fingerprinting Model for Device Identification in IoT

P GANERIWALA, S NANDANWAR, A GUPTA, S BHATTACHARYYA AND R MUTHALAGU

Accepted
SAI IntelliSys 2023

Cross Dataset Analysis and Network Architecture Repair for Autonomous Car Lane Detection

P GANERIWALA, S BHATTACHARYYA AND R MUTHALAGU

Accepted
IEEE Intelligent Vehicles Symposium
(IV) 2023

Functional Reasoning of System Architecture in the System Modeling Language (SysML) With XML Representation

P GANERIWALA, C CHAMBERS, C SEN AND S BHATTACHARYYA

Accepted
ASME IDETC-CIE 2023

Modeling IoT Behavior for Enforcing Security and Privacy Policies

A GUPTA, D CAMPOS, A DCOSTA, **P GANERIWALA**, S BHATTACHARYYA AND T OCONNOR

Accepted
SAI Computing Conference 2022

Toward Generating System Architecture and Formal Functional Description in the Architecture Analysis & Design Language (AADL) With Structured Natural Language

A CHAUHAN, **P GANERIWALA**, C SEN AND S BHATTACHARYYA

Accepted
ASME IDETC-CIE 2022

Experience

Software and Systems Engineering, Avidyne

SOFTWARE ENGINEER II

Melbourne, FL
May 2026 – Present

- Design and implement **embedded C++ software** for avionics flight display systems, spanning **operating system services, device drivers, and touchscreen-based user interfaces**.
- Verify embedded software correctness through **unit and integration testing**, supporting **DO-178C** and **FAA** certification audits.
- Led testing for the **Vantage 12 major software release (60 tests across 2 hardware configurations)**, cutting the release cycle by **67%** compared with the previous minor release.
- Co-create an internal **Claude Code toolkit** for **DO-178C** certification work (reusable skills for requirements lookup, traceability audits, and AI-graded test logs), adopted by **5 engineers**; built an AI test-log grading workflow targeting **~20 minutes** of manual review per run.
- Mentor extbf6 early-career engineers, including extbf4 interns, guiding onboarding and technical growth.

Software and Systems Engineering, Avidyne

SOFTWARE ENGINEER INTERN / CO-OP

Melbourne, FL
May 2025 – May 2026

- Expanded **end-to-end (E2E) test and evaluation (E2TE)** coverage across navigation, communication, flight management, and flight display systems, increasing overall test coverage by **25%**.
- Developed, integrated, and debugged **C-based flight software** in the avionics stack, supporting compliance with real-time, safety-critical **DO-178C** guidelines for production-ready systems.
- Built **30+ system-level and flight-specific test cases** and **TFC (Test For Credit)** software tests, reducing initial verification cycle time by **10%**.
- Merged product test libraries across multiple avionics platforms, creating unified cross-product testing infrastructure that improved code reusability and maintenance efficiency by **~30%**.
- Enhanced automation capabilities by developing C and Visual Basic test scripts for complex regression and validation processes, accelerating simulation turnaround by 20% and enabling seamless cross-product test execution.
- Executed hardware-in-the-loop simulations using proprietary avionics simulation frameworks, diagnosing and resolving complex execution issues to improve simulation-to-aircraft fidelity by **~10%**.
- Supported flight code development for Avidyne's Quantum Open Avionics Platform, supporting rapid prototyping of next-generation avionics solutions and enabling faster deployment cycles.
- Automated initial regression processes by writing Visual Basic test scripts, improving basic simulation validation efficiency by **~15%**.

ASSIST Research Lab, Florida Institute of Technology

RESEARCH SCHOLAR

Melbourne, FL
August 2021 - Present

- Working with a team of research professionals for formal methods of verification and run-time assurance, ML, IoT, robotics, and cyber security.
- Helped develop **research proposals with professors** on diverse topics, including cognitive agents on human behavior, the assurance of artificial intelligence in safety-critical systems, and the fine-tuning of LLMs for domain-specific queries.
- Collaborating on NASA's **University Leadership Initiative (Round 8)** as part of a **Florida Tech**-led multi-university/industry team to develop a framework for **trustworthy, increasingly autonomous aviation safety systems**; partners include **Penn State, NC A&T State, UF, Stanford, Santa Fe College, Uni of New Mexico, Collins Aerospace, and ResilienX**; part of awards totaling up to \$6.9M over three years.
- Modeling human cognitive behavior representation formally with respect to cyber-sickness in AR/VR systems, with **Collins Aerospace, Iowa State University, RTX Technologies Research Center (RTRC), and Smart Information Flow Technologies (SIFT)**, funded by **DARPA**.
- Applied **Large Language Model (LLM) translation** to cognitive architectures with **Penn State University**, focusing on enhancing the integration of LLMs to facilitate communication and knowledge transfer within cognitive systems.
- Developing a modeling approach for designing, maintaining, and supporting air and sea platform fiber optic communications technology with **Critical Frequency Design**, funded by **Naval Air Systems Command**.

- Formally verifying the autonomous agent to assure safety as well as the logical correctness of the safety-critical system, with **Rockwell Collins and Soar Tech**, funded by **NASA**.
- Advising a Ph.D. student and undergraduate students on transfer learning, automated data labeling, and assurance frameworks for vision-based classification in autonomous aircraft systems funded by **NASA**, addressing safety and reliability challenges in aviation technologies.
- Advised **4 groups of computer science students** on the design, development, and deployment of software for their senior projects
- Mentoring **20–30 undergraduate and high school students** on machine learning engineering approaches in the aerospace and systems domains, leading to **11 publications** that addressed real-world challenges in these fields.
- Investigated the development of a **cognitive-enhanced agent** for automatically piloting aircraft in dense urban environments which emphasized safe and reliable takeoff/landing among aerial traffic without human intervention.
- Created **AssistTaxi**, a novel dataset for runway and taxiway analysis published at IEEE ICMLA 2023 and extended as AssistTaxi-v2 (AIAA SciTech 2026), contributing to autonomous operations.
- Developed an **autonomous aircraft perception system** for accurately detecting and labeling line markings on an airport taxiway.
- Assisted with the **formulation of quizzes and homework projects** for the courses: Python, Database Systems, Web Applications, Big Data and Management, and Software Metrics.

L3Harris Institute for Assured Information, Florida Institute of Technology

GRADUATE RESEARCH ASSISTANT

Melbourne, FL

May 2024 – June 2024

- Developed a **decentralized framework** enabling **multiple autonomous agents**—robotic dogs, drones, and mobile robots—to coordinate, communicate, and reach shared goals.
- Collaborated with **developers and professors** to rigorously test the system in both **simulation** and **real-world environments**.

IRI Research, Florida Institute of Technology

IRI RESEARCH DEVELOPER

Melbourne, FL

May 2023 - July 2023

- Proposed and **implemented a framework using AI language models** to automatically extract software requirements from source code.
- Supervised and coordinated with undergraduate students towards the development process.

Program Committees

Feb 2026	Invited Review Committee Member , International Conference on Artificial Intelligence, Computer, Data Sciences and Applications	Boracay Island, Philippines
Dec 2025	Invited Reviewer , 24th IEEE International Conference on Machine Learning and Applications (ICMLA)	Boca Raton, FL
Oct 2025	Invited Reviewer , 18th International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation.	Pittsburgh, PA
Feb 2025	Invited Reviewer: Top Reviewer , NeurIPS 2025	San Diego, CA
Dec 2024	Invited Reviewer , 23rd IEEE International Conference on Machine Learning and Applications (ICMLA)	Miami, FL
Dec 2024	Invited Reviewer , International Conference on Electrical and Computer Engineering Research	Gaborone, Botswana
Dec 2024	Invited Reviewer , International Conference on Machine Learning (ICML) 2025	Vancouver, Canada
Nov 2024	Invited Reviewer , The 4th International Conference on Electrical, Computer, Communications and Mechatronics Engineering	Male, Maldives
Sep 2024	Invited Reviewer , International Conference on Learning Representations (ICLR) 2025	Singapore EXPO
Aug 2024	Invited Reviewer , 23rd IEEE International Conference on Machine Learning and Applications	Miami, FL
Jun 2024	Invited Reviewer , International Conference on AI, Information Processing and Cloud Computing	Sanya, China
May 2024	Invited Reviewer , NeurIPS 2024	Vancouver, Canada
Aug 2023	Invited Reviewer , 22nd IEEE International Conference on Machine Learning and Applications (ICMLA)	Jacksonville, FL
Nov 2022	Invited Reviewer , 2023 American Control Conference (ACC)	San Diego, CA

Skills

Programming	Java, C/C++, Python, Visual Basic, Bash, MATLAB, LaTeX
Data Analytics	Jupyter, pandas, Dask, Statsmodels, Seaborn, MySQL, MongoDB, MySQL Workbench, Neo4j, Elasticsearch
Machine Learning Libraries	scikit-learn, XGBoost, OpenCV, nltk, pandas, scipy
Deep Learning / LLMs	TensorFlow, PyTorch, Keras, CUDA, TensorRT, BERT, GPT, Hugging Face Transformers, Hugging Face Accelerate, PEFT/LoRA, LangChain, LlamaIndex, Claude Code
Cloud & MLOps	AWS (S3, SageMaker, EC2), Ray, Weights & Biases, MLflow
Formal Verification	NuSMV/nuXmv, Uppaal, AGREE, PRISM, TLA+ - Coq (Class Projects)
Robotics & Systems Engineering	Robot Operating System (ROS), AADL, SysML, Gazebo, RViz, Agile Software Development
Other Tools	Docker, Git, Perforce, GitHub Actions, NLP Modules, SparkAR Studio, Android Studio, Arduino