

# Parth Ganeriwala

GRADUATE RESEARCH ASSISTANT

ASSIST Research Lab, Florida Institute of Technology  
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## 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, Robotics and Automation
- *Title of Dissertation:* Applying and Enhancing Transfer Learning Techniques to unify autonomous vehicular models for lane-line detection. (Advisor: Dr. Siddhartha Bhattacharyya)

### Florida Institute of Technology

Melbourne, Florida

MASTER'S LEVEL COURSEWORK 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.
- Research: Assuring Increasing Autonomous Systems with Non-Traditional Human-Machine Roles, which focuses on the design and development of assurance frameworks for mission, safety, and security-critical systems.

### 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

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

## Skills

**Programming** Java, C/C++, Python, MySQL, MongoDB, LaTeX

**Web Technologies** Django with Python, HTML5/CSS, React.js, Node.js, JavaScript/JQuery, PHP/Apache

**Data Analytics** Jupyter, pandas, numpy, Dask, MySQL Workbench, Neo4j, Elasticsearch, Statsmodels

**Machine Learning Libraries** scipy, sci-kit learn, nltk, pandas, OpenCV

**Deep Learning Frameworks** Tensorflow, Pytorch, Keras, Cuda, BERT, GPT, Jurassic, LLMs

**Formal Verification** NuSmv/NuXmv, Uppaal, AGREE, TLA+ - Coq (Class Projects)

**Other** SysML, AADL, Cybersecurity, Agile Development, Software Development, NLP Modules

## Experience

### ASSIST Research Lab, Florida Institute of Technology

Melbourne, FL

RESEARCH PROFESSIONAL

August 2021 - Present

- Collaborated with Rockwell Collins on a NASA-funded project to formally verify the safety and logical correctness of a safety-critical autonomous agent system.
- Employed formal methods (e.g., theorem proving, model checking) to analyze agent behavior and guarantee desired properties.
- Contributed to ensuring the reliable and predictable operation of the autonomous system. (Development and deployment of a Soar-nuXmv translator)
- Developed a formal modeling approach for designing, maintaining, and supporting air and sea platform fiber optic communications technology as part of the "Critical Frequency Design" project funded by Naval Air Systems Command.
- Utilized formal methods (e.g., state-based models, temporal logics).
- Addressed the limitations of SysML for function-based modeling and reasoning by introducing an XML-based approach and developing the XMLSlim optimization algorithm.
- Developed and implemented formal verification methods (e.g., model checking, theorem proving) in projects like "Assuring Adaptive Learning-Enabled Increasingly Autonomous Systems" and "A BERT Approach on Transforming Engineering Requirements into SysML Diagrams using XML."
- Demonstrated ability to analyze system behavior and ensure safety properties through formal methods.
- Pursuing my thesis on formal generalization of common knowledge in transfer learning methods.

### IRI Research, Florida Institute of Technology

Melbourne, FL

GRADUATE RESEARCH ASSISTANT

May 2023 - August 2023

- Proposed and implemented a framework using AI language models to automatically extract software requirements from source code ("Automated Framework to Extract Software Requirements from Source Code").
- Proposed a novel automated framework that extracts software requirements directly from source code using LLMs APIs.
- Supervised and coordinated with undergraduate students towards the development process.

# Publications

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## **AssistTaxi: A Comprehensive Dataset for Taxiway Analysis and Autonomous Ops**

P GANERIWALA, S BHATTACHARYYA, S GUNTHER, B KISH, MA H KHAN, A DHADOTI AND N NEOGI

*Accepted*  
ICMLA 2023

## **Towards Knowledge Extraction and Parsing of XML Metadata for SysML System Architecture Modeling**

C CHAMBERS, P GANERIWALA, S BHATTACHARYYA, C SEN AND N NUR

*Accepted*  
UEMCON 2023

## **Automated Framework to Extract Software Requirements from Source Code**

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

*Accepted*  
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*  
Systems Conference 2023

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

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

*Accepted*  
IntelliSys 2023

## **Cross Dataset Analysis with Network Architecture Repair for Transfer Learning**

P GANERIWALA, S BHATTACHARYYA, R MUTHALAGU AND N NEOGI

*Accepted*  
IEEE T-IV 2023

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

C CHAMBERS, P GANERIWALA, C SEN AND S BHATTACHARYYA

*Accepted*  
IDETC 2023

## **Modeling IoT Behavior for Enforcing Security and Privacy Policies**

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

*Accepted*  
Computing Conference 2022

## **Towards Generating System Arch and Formal Functional Description in AADL**

A CHAUHAN, P GANERIWALA, C SEN AND S BHATTACHARYYA

*Accepted*  
IDETC 2022

## **ALINA: Automated Line Identification and Notation Algorithm**

MA H KHAN, P GANERIWALA, S BHATTACHARYYA, R MUTHALAGU AND N NEOGI

*Under Review*  
CVPR 2024

## **Systems Engineering with Architecture Modeling, Formal Verification and Human Interactions for Learning-Enabled Autonomous Agent**

P GANERIWALA, R JONES, M MATESSA, S BHATTACHARYYA, J DAVIS, S ROLLINI, H PUROHIT, N NEOGI, P MINER

*Under Review*  
INCOSE Systems Journal

## **Cyber Security Architecture Design Language (CSADL++) for IoT Interactions**

P GANERIWALA, N NARAYAN, F NEMBARD, A GUPTA AND S BHATTACHARYYA

*Under Review*  
IEEE Systems Journal

## **A BERT Approach on Transforming Engineering Requirements into SysML Diagrams using XML**

P GANERIWALA, C CHAMBERS, R WHITE AND S BHATTACHARYYA

*Draft Ready*  
ICML 2024

## **FLAIR: Few-Shot Learning Paradigms for Ancient Indus Valley Script Recognition**

P GANERIWALA, D ATTURU AND D MITRA

*Draft Ready*  
NeurIPS 2024

## **A Multi-Dataset Effectiveness Analysis using IPAssess**

A DHANAWADE, P GANERIWALA, AND S BHATTACHARYYA

*Draft Ready*  
ACM Networking 2024

## **Cognitive-Driven Autonomous Drone Navigation in Dense Urban Environments**

P BACHLEDA, R DIAZ, M GOURDINE, C AJABOR, P GANERIWALA, AND S BHATTACHARYYA

*Draft Ready*  
AAAI 2024

## **Enhancing Aerial Object Tracking: A Roomba Detection Methodology**

A GUNA, P GANERIWALA, AND S BHATTACHARYYA

*Draft Ready*  
ICMLA 2024