

# Neelanjana Pal

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Electrical and Computer Engineering  
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## Programming Languages

Matlab (primary), Python,  
basics of C++, Java, R

## Deep Learning Tools

Keras, TensorFlow,  
Sci-Kit, Torch, etc.

## Education

**Ph.D. in Electrical Engineering  
(2023), Vanderbilt University,**  
3.76

**MS in Electrical Engineering,  
(2020) Vanderbilt University,**  
3.76

**BE in Electrical Engineering (2015),  
Jadavpur University,**  
8.5 (out of 10)

## Teaching Experiences

Teaching Assistant at Vanderbilt University  
(2017-2019):

Courses: Introductory Programming (mainly  
Matlab); Digital Logic (Classroom and Lab);  
Circuits II (Lab)

[Google Scholar](#)

[ResearchGate](#)

## RELEVANT COURSES

**Graduate:** Intelligent Systems & Robotics;  
Detection & Estimation Theory; Systems  
Theory; Random Processes;  
Hybrid/Embedded System; Cyber-Physical  
Systems; Deep Learning; Intro to  
Reinforcement Learning;  
Machine Learning; Artificial Intelligence

**Undergraduate:** Control Systems  
Engineering; Advanced Control Theory;  
Computer and Control Engineering; Power  
Electronics

## Career Objective

Current Ph.D. student and researcher at Vanderbilt University working on **reachability-based verification of Deep Neural Networks and safety assurance**. Looking for internship opportunities **in the field of artificial neural networks and their applications**, along with **verification of deep learning models using formal verification methods and research problems related to their integration in Cyber Physical Systems (CPS)**; also interested in exploring the field utilizing available **data patterns** to better understand recent trends of the industries and in academic research.

## Research Experience (2019-present)

Currently working as a graduate research assistant in [veriVITAL](#) lab in the [Institute for Software Integrated Systems \(ISIS\)](#) under **Prof. Taylor Johnson**. The lab's primary focus is to “develop formal verification techniques and tools for CPS, building on and advancing foundational results in formal methods, control theory, distributed systems, and real-time/embedded systems.” The members of this lab developed a set-based reachability tool ([NNV: Neural network Verification](#)) using **MATLAB** for safety and robustness analysis of Neural Networks. As a part of the lab, collaborated on multiple research projects, including works published in conferences as

- Worked with a colleague on Star-based reachability analysis and helped to train networks in MATLAB with Satlin, Satlins, and leaky relu activation functions and analyzed them using NNV; **co-authored a journal paper on FMAC 2021, based on the findings.**
- Worked on reachability analysis of semantic segmentation networks with the same colleague and **published a Conference paper in CAV 2021.**
- Currently working on the **application of NNV on regression-based networks and time series data with adversarial attacks, presented in the segment in SNR 2021, and an extended version is under review.**
- Participated in a friendly competition for ‘**Verification of Neural Networks**’(VNN) hosted along with **CAV 2020 and CAV 2021** conferences.
- Helped Dr. Johnson review papers for several conferences: **CAV, FORMATS, HSCC, ICCPS, ICCV, AACL**, etc.
- Part of Artifact Evaluation Committee for **FORMATS, CAV.**

## Industry Experience (2015-17):

- **Engineer-in-Training (Aug-Nov, 2015):** 3 months international training program at the **Rockwell Automation office, Shanghai, China.**
- **Project Engineer (May 2015 – June 2017):** CPG group at **Rockwell Automation India Pvt. Ltd.** Responsible for handling the workflow from the start of a project to the commissioning of the industrial programmable logic control systems (hardware and software) at the client site.
- **EDG Summer Intern (May-Aug, 2022):** Deep Learning Toolbox group at **The Mathworks**. Along with other researchers from the UK team, developed the toolbox for Neural Network Verification, which is partially deployed in the 2022b edition of MATLAB.