

# Rajiv Teja Nagipogu

✉ [rajivteja.nagipogu@duke.edu](mailto:rajivteja.nagipogu@duke.edu) • 📄 [rajiv256.github.io](https://rajiv256.github.io)

## EDUCATION

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**Ph.D. Student in Computer Science @ Duke**

**Aug 2021 - Present**

CGPA: 3.9/4.0

*Tentative Thesis: Theory and Experiments in Adaptive Molecular Computing Systems*

Advisor: [Prof. John H. Reif](#)

Notable Courses: Natural Language Processing, Reinforcement Learning, Machine Learning

**Bachelor of Technology in Computer Science @ IIT Madras**

**Jul 2013 - May 2017**

*Indian Institute of Technology, Madras*

CGPA: 8.2/10

Thesis: A Unikernel Web Server in Rust

Advisor: [Prof. Chester Rebeiro](#)

## AWARDS

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- [GP-NANO fellowship](#) for the Fall '23 semester.

## PUBLICATIONS

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- **Journal** Leak-resilient enzyme-free nucleic acid dynamical systems through shadow cancellation ([Link](#)) at [Royal Society Interface Journal](#)
- **Poster:** Improving the Kinetics of Strand Displacement Systems via Leak Cancellation ([Link](#)) at [FNANO 23](#)
- *WikiSeeAlso:* Suggesting tangentially related concepts for Wikipedia Articles ([Link](#)) at [MIKE 2017](#)
- MuRIL: Multilingual Representations for Indian Languages ([ArXiv](#))

## SKILLS

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- **Programming Languages:** Python, C/C++, Java, Julia, Matlab.
- **Machine Learning Frameworks:** Pytorch, Tensorflow, scikit-learn
- **Data Science:** NumPy, Pandas
- **Lab Skills<sup>1</sup>:** Gel electrophoresis, Fluorescence Spectroscopy, DNA strand displacement

## WORK EXPERIENCE

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**Machine Learning Engineer @ Google Research**

**May 2020 - July 2021**

*via Optimum InfoSystem, Bangalore, India, Supervisor: Prof. Partha Talukdar*

- Member of the Natural Language Understanding (NLU) team under [Prof. Partha Talukdar](#).
- Worked on building deep learning models to enable temporal reasoning over events in natural language texts.

**Machine Learning Engineer @ Kenome.io**

**Dec 2018 - April 2020**

*Bangalore, India, Supervisor: Prof. Partha Talukdar*

- [Kenome.io](#) is a core AI company helping enterprises derive insights from unstructured text data using cutting-edge Machine Learning, NLP, and Knowledge Graphs.
- Built and developed ML models on real-world text data for client-specific use cases.
- The high-level tasks include Named Entity Recognition and KG-based Question Answering.

**Software Developer @ PayPal**

**Aug 2017 - Nov 2018**

*Chennai, India*

- Part of the team responsible for maintaining the Unix servers that run internal infrastructure applications.

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Beginner in these skills as my undergraduate training was purely in Computer Science. But I am a quick learner.

## PROJECTS

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### Autonomous learning in Chemical Reaction Networks

Aug 2022 - Present

Towards PhD Thesis, Guide: [Prof. John Reif](#)

Duke

- Developed a Chemical Reaction Network (CRN) system that enables autonomous neural network-like learning.
- Demonstrated the results in several linear and nonlinear binary classification datasets. The paper is currently in review.

### Leak-resilient nucleic-acid dynamical systems

Aug 2022 - Present

Towards PhD Thesis, Guide: [Prof. John Reif](#)

Duke

- Improved an existing strategy towards controlling noise (a.k.a *leaks*) in strand displacement circuits.
- Created simulations using several Molecular computing tools and frameworks. The paper is currently in review.
- Demonstrated the results in several catalytic and autocatalytic dynamical systems. The paper is currently in review.

### A Unikernel Web Server in Rust [\[CODE\]](#) [\[DOCUMENTATION\]](#)

Jan 2017 - May 2017

Undergraduate Thesis, Guide: [Prof. Chester Rebeiro](#)

IIT Madras

- The aim was to implement a standalone web server completely in Rust and demonstrate the utility of such servers on the cloud in terms of memory safety and speed.
- Built a network stack from scratch on top of a minimal open-sourced [Rust kernel](#).
- Wrote a network driver for the [RTL8139](#) ethernet card to handle packet transmission and reception mechanisms.
- Implemented a driver for the [PIC8259](#) interrupt controller to bridge the hardware and system interrupts during packet exchange.
- The server in its current state can transmit and receive fixed-length UDP packets.
- Work got featured in Rust community's [newsletter\(6th entry\)](#).

### Algorithm Implementations for Competitive Programming [\[CODE\]](#)

Personal Interest Project

IIT Madras

- Active in the competitive programming arena since my sophomore year.
- Explored and implemented advanced data structures and algorithms outside the academic curriculum.

## SCHOLASTIC ACHIEVEMENTS

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- Received a scholarship from the Govt. of India that covered 70% of my undergraduate tuition.
- Secured an All India rank of 1865 in IIT-JEE (Indian Institute of Technology - Joint Entrance Examination) among more than 5,00,000 candidates.
- Stood II in a state-wide talent search exam conducted by S.A.S.T (Society for Advancement in Science and Technology) during IX standard.

## EXTRA-CURRICULAR ACTIVITIES

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- Helped organize the FNANO 2023 and FNANO 2024 at Snowbird, Utah.
- Organized a departmental sports event as a core member of the department club.
- Organized and taught a Python workshop attended by over 100 undergraduate students for our university's annual Techfest, Shaastra 2016.
- Also prepared the problem sets for a three-tier programming event, Triathlon, during this time.
- Intermediate-level chess player ([Profile](#)).