# Rajiv Teja Nagipogu

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## EDUCATION

**Ph.D. Student** — **Aug 2021 - Present**
*Computer Science* — *Duke*
CGPA: 4.0/4.0

*Tentative Thesis: Molecular-scale learning using DNA computing*
*Advisor*: Prof. John H. Reif

**Bachelor of Technology** — **Jul 2013 - May 2017**
*Computer Science & Engineering* — *Indian Institute of Technology, Madras*
CGPA: 8.2/10

*Thesis*: A Unikernel Web Server in Rust
*Advisor*: Prof. Chester Rebeiro

## AWARDS

- GP-NANO fellowship for the Fall '23 semester.

## PUBLICATIONS

- Improving the Kinetics of Strand Displacement Systems via Leak Cancellation [ACCEPTED]
  to FNANO 23
- *WikiSeeAlso: Suggesting tangentially related concepts for Wikipedia Articles* [ACCEPTED]
  at The Fifth International Conference on Mining Intelligence and Knowledge Exploration MIKE 2017
- MuRIL: Multilingual Representations for Indian Languages

## SKILLS

- **Programming Languages:** Python, C/C++, Java, Rust
- **Machine Learning Frameworks:** Pytorch, Tensorflow, scikit-learn
- **Data Science:** NumPy, Pandas

## WORK EXPERIENCE

**Google Research** — **May 2020 - July 2021**
*via Optimum InfoSystem, Bangalore, India, Supervisor: Prof. Partha Talukdar*

- Worked as a Research Engineer in the Natural Language Understanding (NLU) team.
- Worked on building deep learning models to enable temporal reasoning over events in natural language texts.

**Kenome.io** — **Dec 2018 - April 2020**
*Bangalore, India, Supervisor: Prof. Partha Talukdar*

- Worked as a Machine Learning Engineer.
- 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.

**PayPal** — **Aug 2017 - Nov 2018**
*Chennai, India*

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

## PROJECTS

**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).

**Link Augmentation for Wikipedia Articles [CODE] [REPORT]** **Oct 2016 - Nov 2016**
*Natural Language Processing, Instructor: Prof. Sutanu Chakraborti* *IIT Madras*

- The aim was to suggest 'See also' section links that augment the connectivity of an under-developed Wikipedia article.
- Extracted the candidates from Wikipedia's category tree.
- Developed a web content based similarity measure and a link-based measure that ensure relevance and diversity among the suggestions.
- Combined these measures using classifier based weights and used the ensemble score to rank the candidates.
- Top ranked candidates are then suggested as 'See also' links.

**Chess Engine with AI [CODE]** **Jul 2015 - Nov 2015**
*Personal Interest Project* *IIT Madras*

- Implemented a modified Minimax algorithm with alpha-beta pruning to build a dynamic depth game tree based on the pieces involved.
- Designed a scoring algorithm based on the game's state along with several positional heuristics.
- Reduced the complexity of computations greatly by implementing a data structure called BitBoard that represents each row of the board as a 64-bit integet i.e. 8-bits per cell.

**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

- Received a scholarship from the Govt. of India that covered 70% of my college fee.
- 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

- 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.