Rajiv Teja Nagipogu

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EDUCATION

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

PUBLICATIONS

- *WikiSeeAlso: Suggesting tangentially related concepts for Wikipedia Articles* [ACCEPTED]
  at The Fifth International Conference on Mining Intelligence and Knowledge Exploration MIKE 2017

SKILLS

- **Programming Languages:** Python, C/C++, Java, Rust, Haskell (Decreasing order of proficiency)
- **Machine Learning Frameworks:** Pytorch, scikit-learn
- **Miscellaneous:** Elastic Search, MongoDB
- **Web Development:** jQuery, Node.js

WORK EXPERIENCE

Software Engineer (Machine Learning) **Dec 2018 - Present**
Kenome.io, Bangalore

- Helping enterprises derive insights from unstructured text data through cutting-edge Machine Learning, NLP and Knowledge Graphs (KG).
- Adapted a distant supervision based deep learning model to recognise named entities from custom domains.
- Implemented a graph based ranking algorithm using Semantic Role Labelling to automatically match natural language queries onto a set of predefined FAQs.
- Assembled a framework to enable Question-Answering capabilities over a product knowledge graph by implementing a state-of-the-art neural model in Pytorch.
- Trained the KG-embeddings required by the above model over the product KG using the RotatE framework
- The model produced an accuracy of over 95% in answering simple questions about the products and is currently being deployed into one of our client applications.

Software Engineer **Aug 2017 - Nov 2018**
PayPal, Chennai

- Part of the team responsible for maintaining the Unix servers that run internal infrastructure applications.
- Built a web application in Django to automate a few of our weekly tasks, reducing their ETA from hours to a few minutes.

Software Development Intern, Search Semantics Team **May 2016 - June 2016**
Flipkart, Bangalore

- Developed a regression model to optimize the parameters responsible for the relevance of search results.
- Implemented a feature to display the brands related to a query as 'Guides' in the search results page.

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.
- *Spell correction:* Implemented Levenshtein distance using dynamic programming to collect the candidates at a specific edit distance.
- Implemented a "Noisy channel" based bayesian inference method for ranking them.
- Implemented the BK-Tree data structure to facilitate faster retrieval of the candidates.
- *Phrase correction:* Implemented a probabilistic language model using N-grams from the COCA corpus.
- Demonstrated the context awareness of the model in detecting incorrect usage of words in sentences.

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.

PDF Reader in Java **April 2015 - May 2015**
Advanced Programming Lab *IIT Madras*

- Implemented functionalities such as saving and restoring highlights, search, night mode etc.,
- Also incorporated the functionality to fetch meanings of the words on-the-fly. Implemented a polynomial hash function to speed-up the retrieval.

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.