Rahul Kejriwal

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EDUCATION

Program	Institution	%/CGPA	Year of Completion
B.Tech. in CSE	Indian Institute of Technology, Madras	**9.79**	2018
XII (CBSE)	Birla High School, Kolkata	**97.6%**	2014
X (CBSE)	Birla High School, Kolkata	**10/10**	2012

SCHOLASTIC ACHIEVEMENTS

- **President of India Prize,** IIT Madras, 2018 (highest CGPA in 2018 graduating batch)
- **All India Rank - 113**, JEE-Advanced, 2014
- **All India Rank - 61**, JEE-Mains, 2014
- **State Rank - 7**, WBJEE, 2014
- **KVPY scholarship** holder under SX Stream, 2013

PROFESSIONAL EXPERIENCE

1. **Data and Applied Scientist II** (Sep 2020 – Present)
   Data and Applied Scientist (Jul 2018 – Aug 2020)
   (Microsoft IDC, Hyderabad)
   - Worked on improving relevance, coverage and quality of triggering for translation experiences on Bing.
   - Improved neural machine translation & transliteration quality for Indic languages in very low-resource scenarios.
   - Expanded translation language support for Indic languages and transliteration support for international languages.
   - Contributed to the Microsoft Research's LITMUS project for multilingual evaluation of NLP systems.

2. **Research Engineering Intern** (May 2017 - Jul 2017)
   (Microsoft IDC, Hyderabad)
   - Worked on Statistical Machine Translation profile for the Bing Translate platform.
   - Worked on improving translation models for SMS domain to improve accessibility for machine-generated SMSs.
   - Constrained to work with very less parallel in-domain data to create models that generalize well.
   - Delivered significant increase over baseline models in terms of BLEU score.
   - Submitted a paper based on my work titled “Investigation & Modelling of SMS Translation” which was accepted at Synapse AI Meet 2017 (Microsoft internal conference).

3. **Web Development Intern** (May 2016 - Jul 2016)
   (DrumUp, Bangalore - startup by IIT-D alumni)
   - Worked mainly on backend using Django framework.
   - Considerable amount of work with Facebook, Twitter and LinkedIn APIs.
   - Built and integrated an analytics module for the social media management app, DrumUp as well as their employee advocacy platform.

- Built feature to pull social feed and incorporate it for their employee advocacy platform.
- Built and integrated a link shortener service with click-tracking capability.
- Implemented other small features like a promotional growth hack and updating the API calls being used.

4. **Software Engineering Intern** (Feb 2016 - May 2017)
   (NETECH LLC, Connecticut - Work from Home)
   - Built light-weight interactive code tutorials using basic HTML, CSS and JavaScript for publishing along with a book by Tony Gaddis (Publisher: Pearson).
   - Built code exercises using TuringsCraft platform for checking correct usage of basic programming constructs for the same book.
   - Delivered a prototype system for checking accuracy of pronunciation of medical terminology.
   - Headed a team of 4 interns for organizing, scheduling, and ensuring timely delivery of the project.

PUBLICATIONS

1. Srinivasan, A., Kholkar, G., Kejriwal, R., Ganu, T., Dandapat, S., Sitaram, S., Santhanam, B., Aditya, S., Bali, K., Choudhury, M. (2022, February). **LITMUS Predictor: An AI Assistant for Building Reliable, High-Performing and Fair Multilingual NLP Systems.** In *AAAI-2022.*
2. Kunchukuttan, A., Jain, S., & Kejriwal, R. (2021, April). **A Large-scale Evaluation of Neural Machine Transliteration for Indic Languages**. In *Proceedings of the 16th Conference of the European Chapter of the Association for Computational Linguistics: Main Volume* (pp. 3469-3475).
3. Goyal, V., Kunchukuttan, A., Kejriwal, R., Jain, S., & Bhagwat, A. (2020, November). **Contact Relatedness can help improve multilingual NMT: Microsoft STCI-MT@ WMT20**. In *Proceedings of the Fifth Conference on Machine Translation* (pp. 202-206).
4. Mathew, D., Jeyakumar, G. R., Kejriwal, R., & Chakraborti, S. (2018, December). **Towards Predicting Age of Acquisition of Words Using a Dictionary Network**. In *15th International Conference on Natural Language Processing* (p. 206).

COURSE PROJECTS

1. **Age of Acquisition predictions using Dictionary Networks** (Aug 2017 – Nov 2017)
   (Computational Models of Cognition: Prof. Sutanu Chakraborti)
   - Analyzed dictionary networks to identify relevant features with cognitive rationales
   - Built classification models to predict age-bracket for Age of Acquisition of words with significant accuracy
   - Submitted a paper grown out of this work titled “Towards Predicting Age of Acquisition of Words Using a Dictionary Network” which was accepted at ICON-2018 conference.

2. **TrafficLeak – Side Channel Attack on Encrypted Web Traffic** (Aug 2017 – Nov 2017)
   (Secure Systems Engineering: Prof. Chester Rebeiro)
   - Built models to detect domain being visited by a user from encrypted traffic logs of a user over an SSH tunnel
   - Adapted and implemented techniques from a paper given by Xiang et al. in “Touching from a Distance: Website Fingerprinting Attacks and Defenses”
   - Models worked well even after caching of web pages

3. **DHE-1 Cryptosystem** (Jan 2017 – Apr 2017)
   (Applied Cryptography: Prof. Chester Rebeiro)
   - Designed a hybrid SPN-Feistel symmetric cipher and implemented an optimized version in C
   - Uses variable round structure based on 128-bit encryption key in order to prevent linear and differential cryptanalytic attacks

- Generated S-Boxes using Genetic Optimizations

4. **C-Obfuscator** (Aug 2016 – Nov 2016)
   (Paradigms of Programming: Prof. Rajsekar Manokaran)
   - Adapted and implemented a compiler for translation from a subset of C to Cь based on the design given by McKeeman in 'Cь: A Low-Level Subset of C'
   - Uses a 6-layer compilation pipeline to deliver the final obfuscated code
   - Final code provides almost negligible drop in performance using gcc compiler optimization on obfuscated code

5. **MacroJava Compiler** (Aug 2016 – Nov 2016)
   (Compiler Design: Prof. V. Krishna Nandivada)
   - Built MacroJava to MiniJava compiler for macro-expansion using flex and bison
   - Compiles MiniJava to MIPS assembly using 5-passes on the parse-tree built by JavaCC and JTB
   - Type Checking, IR Generation, Simplified IR Generation, Register allocation, MIPS Code Generation were the 5 passes

6. **Research Internship: Scale-Free Graph Coloring** (Dec 2015 – Jan 2016)
   (Guide: Professor Rupesh Nasre)
   - Worked on designing and implementing different algorithms to efficiently color very large real-world scale-free graphs found in various social networks.
   - Experimented with various heuristics in order to find a balanced trade-off between optimal coloring and execution times.

SKILLS

- **Languages:** Proficient in C, C++, C#, Python, Java, x86 Assembly, Verilog, JavaScript, …
- **Industry Software Skills:** Protege, Weka, Git, Linux, Windows, PostgreSQL, MongoDB, LATEX …
- **Libraries & Frameworks:** NLTK, numpy, scikit-learn, TensorFlow, PyTorch, FAISS, CUDA, Django …

COURSE WORK (* - THEORY & LAB COURSE)

Machine Learning & AI:	Introduction to Machine Learning, Artificial Intelligence, Theory and Applications of Ontologies, Computational Models of Cognition, Natural Language Processing, Deep Learning
Security:	Applied Cryptography, Secure Systems Engineering
Systems:	Operating Systems*, Compiler Design*, Computer Networks*, Computer System Design*, Introduction to Database Systems
Algorithms & Programming:	Data Structures and Algorithms*, Principles of Software Engg.*, Paradigms of Programming, GPU Programming, Languages, Machines and Computations
Hardware:	Switching Theory & Digital Design*, Computer Organization*, Digital Design Verification
Math:	Discrete Mathematics for Computer Science*, Basic Graph Theory, Probability, Statistics and Stochastic Process, Linear Algebra for Engineers, Calculus I Functions of One Variable, Calculus II Functions of Several Variables, Game Theory
Others:	Principles and Parameters of Natural Language, Decision Modelling