Rahul Kejriwal | CS14B023

Indian Institute of Technology, Madras

kejriwalrahul.1996@gmail.com ✆ 7044142527

https://kejriwalrahul.github.io https://www.linkedin.com/in/rahul-kejriwal-511661a6/

EDUCATION

Program	Institution	%/CGPA	Year of Completion
B.Tech. in CSE	Indian Institute of Technology, Madras	**9.77**	2018
XII (CBSE)	Birla High School, Kolkata	**97.6%**	2014
X (CBSE)	Birla High School, Kolkata	**10/10**	2012

SCHOLASTIC ACHIEVEMENTS

- **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
- **Sri V Ramachandran Prize** for highest CGPA till 4th Semester in the CSE 2014 batch
- **Pre-Placement Offer** from Microsoft IDC, Hyderabad

PROFESSIONAL EXPERIENCE

1. **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).

2. **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.

3. **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.

COURSE PROJECTS

1. **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

2. **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 C♭ based on the design given by McKeeman in 'C♭: 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

3. **3-Stage Pipeline 16-bit Processor in Verilog** (Jan 2017 – Apr 2017)
   (Digital Design Verification: Prof. Aritra Hazra)
   - Designed and implemented the processor for execution of various mathematical, logical and data transfer instructions
   - Performed assertion-based verification on the design using SystemVerilog

4. **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

5. **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

6. **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

OTHER PROJECTS

1. **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.

2. **Raspberry Pi Face Recognition Lock** (Feb 2015 – Apr 2016)
   (Collaborated as member of Electronics Club, CFI)
   - The project used OpenCV Face Recognition Algorithms on a Raspberry Pi single board computer to recognize authorized faces and used its GPIO headers to control the actuation circuit.
   - Contributed to the electronic circuit design and fabrication, configuration of the Raspberry Pi, and coding the interface between the face recognition module and the underlying electronic circuit.

SKILLS

- **Languages:** Proficient in C, C++, Comfortable with Python, Java, x86 Assembly, Verilog, JavaScript, SQL (MySQL), HTML, CSS …
- **Industry Software Skills:** Linux, Windows, PostgreSQL, MongoDB, Protege, Weka, Git, LATEX …
- **Libraries & Frameworks:** NLTK, numpy, scikit-learn, NodeJS, AngularJS, Yeoman, Django …

COURSE WORK (* - THEORY & LAB COURSE, # - ONGOING)

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

POSITIONS OF RESPONSIBILITY

1. **WebOps Core (Backend)** (Sep 2017 – Feb 2018)
   (Exebit - 2018, CSE Department IIT Madras)
   - Managed team of 4 coordinators and was responsible for building the backend for the Exebit website.
   - Was also responsible for building and maintaining the Exebit blog.

2. **WebOps Coordinator (Backend)** (Jun 2015 – Jan 2016)
   (Shaastra - 2016, IIT Madras)
   - Shaastra is the annual technical fest of IIT Madras.
   - Worked on the backend portals for the Institute Tech Fest using NodeJs framework along with AngularJS to form full-stack web apps.
   - Specifically worked on the EventsPortal (a portal for Cores and Coordinators to plan the events) and LeadsPortal (a portal used by the Spons department).

3. **Electronics Club Coordinator** (Aug 2015 – May 2016)
   (Center for Innovation, IIT Madras)
   - Organized electronics sessions and workshops for more than 300 students.
   - Mentored a group of 4 students on the project, high accuracy Wifi based Positioning System (WiPS).
   - Worked on various mini-projects like: Arduino based Odometer/Speedometer, Line-following Robot and Arduino based device to write posts on Twitter.

4. **Event Coordinator – Humanoids** (Aug 2015 – Jan 2016)
   (Shaastra - 2016, IIT Madras)
   - Introduced a new tech event, "Humanoids" (participants were asked to build a Biped Robot to solve an interesting problem statement).
   - Successfully conducted the event and received large number of participants from various regions.