RICHI DUBEY | richidubey@gmail.com

EDUCATION

Birla Institute of Technology & Science, Pilani Goa, India
B.E., Computer Science | CGPA: 8.84 *2017 - 2021*

- *K*ey Courses: Computer Networks (A-Grade), Data Structures and Algorithms, Real-Time Systems, Machine Learning, Operating Systems (A-Grade), Artificial Intelligence, Neural Networks, Data Storage Technologies and Network, Data Center Design and Network
- *A*wards: Merit Cum Need Scholarship

WORK EXPERIENCE

Research Intern - High-Performance Real-Time Lab, UNIMORE, Italy *Jan 2021 – Present*
Undergraduate Thesis

- Working to improve determinism in memory hierarchy and virtualization for modern multi-core systems.
- Integrating hypervisor, RTOS, and applications in a predictable and flexible way using Cache Coloring and Page Coloring, which is proven to provide a maximum speedup upto **77.4%** in random memory access time.

Software Developer - RTEMS Real-Time Operating System *May 2020 – August 2020*
Google Summer of Code | More details here

- RTEMS is a real-time operating system which is used in several NASA/ESA satellites, sports bikes, and in particle accelerators at almost all US DOE National Labs and several European facilities.
- Implemented the Strong arbitrary processor affinity (APA) scheduler, which is a state-of-the-art scheduling algorithm that has not been implemented in a real-world operating system before.
- Strong APA scheduler allows higher-priority tasks to be moved among processors in order to make space for lower priority tasks that are limited by affinity constraints. The scheduler is proven to be able to schedule roughly **15-20%** more task sets than other schedulers for certain utilizations.

Software Engineer Intern (Full Stack) *April 2020 – June 2020*
Oracle | Oracle Integration Cloud Team

- Proposed a system and method to identify potential performance degradation in OIC product release pipeline
- Developed a NodeJs Web service that uses Jenkins to show degradation analysis of **500+** OIC tests.
- The Web service helped in detecting the presence of **10%** non-unique tests and close to **5%** degrading tests in the OIC tests that were conducted everyday on Jenkins.
- This detection helped in improving the OIC test (by removing the non-unique tests) and in identifying the potential Web Applications that might be slowing down the entire OIC product.

Software Engineer Intern *May 2019 – July 2019*
Adani Group | Adani Power Training & Research Institute

- Adani Power is India's largest private power company and conducts lots of training courses.
- Led a **4** member team to build an Android app to automate various training practices (registration, attendance of new trainees among others) at the institute.
- The app was made using Android Studio (Java) and used Google's Firebase to support the backend. The application is used by more than **2.5k** people every training season.

CV last updated: June 2021.

PUBLICATIONS

Work in Progress: Strong APA Scheduling in a Real-Time Operating System
Richi Dubey, Vijay Banerjee, Sena Hounsinou and Gedare Bloom
SIGBED International Conference on Embedded Software (EMSOFT) 2021.

AWARDS

HERCULES Prize- edition 2019/2020 — University of Modena and Reggio Emilia, Italy *October 2020*
Awarded €4500 to work with Prof. Marko Bertogna on High-Performance Real-time Architecture for Low-Power Embedded Systems at HIPeRT Lab, Unimore, Italy.

McGill Summer Undergraduate Research in Engineering (SURE) Award — McGill University, Canada *May 2020*
Awarded $5,625.00 in Summer 2020 to work with Prof. Liboiron-Ladouceur on Photonic Hardware for AI.

RESEARCH PROJECTS

Approaches towards censorship circumventions BITS Pilani
August 2020 – December 2020

- Reviewed Noctilucent, a software that tests different use cases of Encrypted-SNI (ESNI) in TLS 1.3 to circumvent censorship. Nearly **30%** of all the websites on the Internet and **59%** of websites hosted on Cloudflare use TLS1.3.
- Set up a server on Microsoft Azure to test security vulnerabilities in DNS over HTTPS and other network security protocols.

Review of Mixed Criticality Systems BITS Pilani
August 2019 – December 2019

- Reviewed the latest research in the field of Mixed Criticality Multi Core Scheduling.
- Reviewed various scheduling algorithm like Global Preemptive EDF, Criticality Based EDF (CBEDF) etc. and various resource sharing protocols like Priority Ceiling Protocol (PCP), Priority Inheritance Protocol (PIP) etc.
- Implemented the Earliest Deadline First with Virtual Deadline (EDF-VD) Scheduling Algorithm by Prof. Baruah et al. in C

POSITIONS OF RESPONSIBILITY

Teaching Assistant - Department of CS & IS BITS Pilani Goa, India
Teaching Assistant for the following core disciplinary courses:

- Design & Analysis of Algorithms (Semester II, 2020 - 2021)
- Data Structure and Algorithm (Semester II, 2019 - 2020)
- Computer Programming (Semester II, 2019 - 2020)
- Logic in Computer Science (Semester I, 2019 - 2020)

Student Coordinator - Film Screening Club BITS Pilani Goa, India
Led the student member committee in the Film Screening Club

- Hosted **5** latest Bollywood movie screenings which saw a participation of over **3000** people.
- Decreased the cost of procuring the film from Mumbai, by **25%** compared to previous years
- Built a new business relationship between the college and **2** cinemas around Goa and conducted multiple off-campus screenings and documentary screenings

SKILLS

Programming Languages: C, C++, Java, Python 3, MySQL
Systems: Linux Kernel, RTEMS Real Time Kernel

HACKATHON

Oracle India SWE interns Hackathon — 2nd Rank *May 2020*

- Developed an Android application and a Web site for ecommerce grocery shopping keeping restrictions during COVID in mind.
- Allows placing orders only on specific date & time respecting the restrictions put by the local government and by identifying the zone *redyellowgreen* of delivery location.
- I supported the back end by writing code for setting up Firebase authentication, database and helped in developing the front end of the Android application.

TECHNICAL BLOG

RTEMS with Richi — Visit here *May 2020 - Present*

Coding in C language and software development for real-time operating systems are discussed in this blog.

VOLUNTEER WORK

Nirmaan — Cause: Education *August 2017 - Present*

Teaching underprivileged kids in the slums around the college and organizing festivals for them.