

Akhil Raj Baranwal

UNDERGRADUATE IN ELECTRONICS AND INSTRUMENTATION ENGINEERING

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Experience

CFAED - Centre For Advancing Electronics Dresden

GUEST RESEARCHER, TECHINSCHES UNIVERSITÄT DRESDEN

- Working on exploiting FPGAs for reinforced deep learning based systems

Dresden, Germany

July 2019 - PRESENT

Micron Technology

EMBEDDED ENGINEER INTERN

- Worked on encrypted high speed memory-trace collection and analysis of DRAM AXI traffic under PetaLinux environments
- Extended the project to develop a Python framework to automate analysis of generated data

Bengaluru, India

May 2019 - July 2019

Adani Power Maharashtra Limited

SUMMER INTERN

- Developed an intelligent Human Machine Interface and Data Acquisition System for controlling several industrial pumps spread across an area of more than 1600 acres.

Tirora, Maharashtra

May 2018 - July 2018

Student Mentorship Programme, BPHC

STUDENT MENTOR, TA

- Taught electronics and architecture concepts to freshers and sophomores while providing input for project ideas.

BITS Pilani, Hyderabad Campus

Jan 2018 - November 2019

Education

Birla Institute of Technology and Science, Pilani

BACHELOR OF ELECTRICAL AND INSTRUMENTATION ENGINEERING

- Technische Universität Dresden, Saxony, Germany — Semester Abroad 2020 (Jan - July)

Hyderabad, India

July 2016 to Present

Delhi Public School Ghaziabad

AISSCE, 93.8%

Ghaziabad, India

2013 to 2015

St. Mary's Convent School

CISCE, 91.2%

Ghaziabad, India

2004 to 2013

Projects

Implementation of Tomasulo's algorithm with write-through cache controller

COURSE PROJECT

- Verilog based implementation of Tomasulo's approach towards dynamic scheduling.
- System also contained a model for LRU based write-through cache for data.

Aug 2019 - Nov 2019

P⁴

UNDERGRAD RESEARCH

- Worked with [Prof Sanket Goel](#) at the [MEMS/Microfluidics Lab](#) to build P⁴, an approximate Poly-Potential Portable Potentiostat based on the [LMP91000EVM](#) to perform simple electrochemical analysis.
- P⁴ supports common electroanalysis routines and reduces the cost of a typical spectro-photometer by about 15-20 times.

[Closed-source](#)

Aug 2019 - Dec 2019

Implementation of MIPS-like processor

COURSE PROJECT

- Verilog based implementation of a 32-bit, 4-stage pipelined processor with Fetch, Decode, Execute, and Writeback stages

Jan 2019 - Apr 2019

ECSP

Closed-source

UNDERGRAD RESEARCH

Jan 2019 - Apr 2019

- Worked with Prof Sanket Goel at the MEMS/Microfluidics Lab to build ECSP, an intelligent colorimeter able to back-estimate the dominant absorption spectra of a solution with characteristic wavelengths in the visible light range.
- ECSP features a precision of 1 nm with a standard deviation of 2.3% and reduces the cost of a typical spectro-photometer by about 150 times.

Fault Tolerant Network on Chips

Open-source

UNDERGRAD RESEARCH

Aug 2018 - Dec 2018

- Worked with Prof Soumya J to propose a new algorithm for fault-tolerant network on chips focusing on a packet-routing strategy for link faults between routers that occur either during manufacturing or in-operation. The algorithm decides the shortest path as well as takes care of distributing the load evenly across the network grid.
- Extended the algorithm for Mesh and Torus topologies for both, routers and link-level faults.

xBITS

UNDERGRAD RESEARCH

Dec 2017 - Aug 2018

- Worked under Dr. Suman Kapur to create a medical device that can diagnose UTI (Urinary Tract Infections) almost 15 times quicker than conventional laboratory methods.
- The device employs an array of colour sensors that predict the contents of the specimen according to RGB absorbance values and a trained model.

EasyMouse

Open-source

INDEPENDENT PROJECT

Jan 2018 - Apr 2018

- Gesture controlled pointing device emulator written in Python targeted towards users with disabled fingers.
- Wearable part based on ATmega328 can be worn around wrist, and data is transmitted wirelessly to the host device.

ardUPS

Open-source

INDEPENDENT PROJECT

Mar 2018 - May 2018

- Smart ATmega328 based CLI programmable UPS for Single Board Computer devices providing options like power throttling and sleep scheduling.
- Selected for Unleash Invisible Intelligence contest by Hackster.io

VMS

Open-source

INDEPENDENT PROJECT

May 2018 - July 2018

- Python utility to sync multiple devices playing the same video using MQTT which syncs timestamps instead of video frames, offering significantly less network usage.

Extra Curriculars

Positions of Responsibility

Head, Automation and Robotics Club @ BITS Pilani Hyderabad Campus : 2018-2019
Member, Embedded electronics team @ Hyperloop India : 2018-2019
Member, On Board Computing @ Pixxel : 2018-2019

Art

Music-composition
Film-Making
Sketching Portraits

Social Service

National Service Scheme (NSS-BPHC) : 2016-2017

Languages

English, Hindi