ASHWIN KUMAR KARNAD

Contact

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Education

2022 BITS - PILANI UNIVERSITY, KK BIRLA GOA CAMPUS
Int. MSc. Physics and B.E Electronics and Instrumentation (Dual Major) CGPA - 7.5/10.0

2017 VVS GJ PU COLLEGE, MYSORE - CLASS 12^{th}
KSEB Board. Marks : Physics - 100%, Chemistry - 96 %, Mathematics 99%

2015 DEMONSTRATION SCHOOL - CLASS 10^{th}
CBSE Board. 9.8/10 CGPA

All India Rank in competitive examinations: TOEFL (score) 106/120, NGPE- Top 30, KVPY-55, ComedK - 113, KCET - 592.

Interests

- Experimental and computational condensed matter physics (Device Physics).
- Interfacing sensors with microcontrollers, Power management, electrical drive system, Instrument design.
- Solving real-world problems using technologies like Distributed Ledger Technology and computational intelligence.

Relevant Work Experience

2022-23 *Research Software Engineer*, MPI FOR THE STRUCTURE AND DYNAMICS OF MATTER, Hamburg. Worked on Computational Scientific support, HPC codes and infrastructure maintanance, Postopus: a python package for POSTprocessing of OctoPUS simulations.

Projects and Experiences

Past Projects

• Studying the effect of high spin orbit coupling material in Josephson Junctions, at *Superconductivity lab, NISER, Bhubaneswar, India.*

• Design of a cryogenic probe for transport measurements at *Superconductivity lab, NISER, Bhubaneswar, India.*

• Design and Simulation of Battery Management System Algorithms for Electric Vehicle Applications. *Kaynes Technology India Pvt Limited, Mysore, India.*

• Simulation of IR seeker missiles and its counter measure in *Defence Avionics Research Establishment - DRDO, Bangalore, India.*

• **GrayBlock Power:** Decentralized financing of energy projects via smart contracts written on public blockchains. (worrked as software developer and project coordinator)

• **Team Imitato:** Designing an exosuit to control a humanoid that can be beneficial in reaching in-accessible and non-human conditions. (Worked as Electronics, Communication and Haptics Control head)

• Determination of temperature of stars by analysing images obtained from a simple camera.

• **A Novel Stove Stand**: Designed and built a contraption to harness electricity (about 20W) from the otherwise wasted heat energy produced while burning LPG gas for cooking. It also reduced the cooking time.

• **Pressure sensitive mat:** A mat that can sense touch, enabling the determination of different poses such as Running, Jumping, Rightward-leftward movement, one leg hop etc.. (Worked in electronics and algorithm design).

• Past electronics team member of **Hyperloop India** and **Project Kratos**.

For more completed projects visit my web page, ashwinschronicles.github.io

Ongoing Projects

• **comfybikes.de:** A simple and smart app that helps you find the optimal saddle height for your bike using image detection.

Articles and Publications

•Phase biasing of a Josephson junction using Rashba-Edelstein effect. Senapati, T., **Karnad, A**. & Senapati, K.

•"Gravitational waves really exist!". Dream 2047 (Vigyanprasar),, 18(7): 28–29, Apr. 2016.

•Review articles on scientific and hobbyist instruments on element14.com

Honors and Awards

2023 1st place, Rad-Daten-Hackathon: worked on comfybikes.de an app to suggest optimal saddle height for your bike using image detection.

2022 1st place, COMPAR EU hackathon: Created an LLM (AI) based solution for a data aggregation platform which helps patients manage their serious chronic illness.

2019 National top 30 in NGPE-19 exam (Graduate physics exam with 11372 candidates).

2019 3^{rd}place in Open CBR Hackathon *organised by University of Leeds*.

2018 Presented a paper entitled "Algorithms in ancient Indian Mathematics and Astronomy" at "National Conference on Ancient Indian Knowledge: Science and Technology", *National Council of Educational Research and Training, New Delhi*.

2018 Awarded Kishore Vaigyanik Protsahan Yojana (KVPY) 2017 Fellowship by *Govt. of India*.

2018 Offered Innovation in Science Pursuit for Inspired Research (INSPIRE) 2017 Scholarship by *Govt. of India*.

2016 Awarded ISCA Travel award by *Infosys Foundation*.

2014-16 Participated in 103^{rd} Indian Science Congress held at Mysore, India.

2016 Participated in IRIS science fair organised by *Intel* at Delhi, India.

2015 Participated in Rashtriya Kishore Vaigyanik Sammelan of 102^{nd} Indian Science Congress held at Mumbai, India.

2014 Participated in 41^{st} Jawaharlal Nehru National Science Exhibition at Chandigarh (Presenting the device stated as "A Novel Stove Stand").

Relevant Coursework

Physics : • Electromagnetic theory I&II • Classical Mechanics • Statistical Mechanics • Quantum Mechanics I&II • Non-Linear Dynamics • Solid State Physics •Atomic and molecular Physics • Nuclear and Particle Physics • Quantum Information and Computing • Quantum Information Theory • Nanotechnology and Nanosensors, Part1&2 - Israel Institute of Technology (Coursera)

Electronics : • Microelectronics • Microprocessors and interfacing • Digital circuits • Electric Machines •Introduction to Data Science in Python-University of Michigan (Coursera) • Signals and Systems • Control Systems • Digital Image Processing • Modern Control Systems • Analog and Digital VLSI design • Transducers and measurement techniques • Electronics instruments & instrumentation technology • Object Oriented Programming

Skills

Computational: • Python (Numpy, Pandas, Xarray, HoloViews) • Shell • LabVIEW • Matlab • JavaScript •LaTeX • C++ • Git • Verilog • 3D CAD modeling (Onshape,Fusion 360) • PCB Design (Eagle CAD)

Instrumentation: • Photolithography • DC Magnetron sputtering • Physical Property Measurement System (DCR and VSM)