

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 12th
KSEB Board. Marks : Physics - 100%, Chemistry - 96 %, Mathematics 99%
- 2015 DEMONSTRATION SCHOOL - CLASS 10th
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 Distributed Ledger Technology and Neuromorphic Computing.

Relevant Work Experience

- 2022-23 *Research Software Engineer, MPI FOR THE STRUCTURE AND DYNAMICS OF MATTER, Hamburg.*
Worked on Computational Scientific support, massively parallel HPC codes and infrastructure maintenance, 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. (Worked 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, 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

- Senapati, T., **Karnad, A.K.** & Senapati, K. Phase biasing of a Josephson junction using Rashba–Edelstein effect. **Nature Communications** 14, 7415 (2023)
- “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 AI-based solution for a data 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 <i>organised by University of Leeds</i> .
2018	Presented a paper entitled “Algorithms in ancient Indian Mathematics and Astronomy” at “National Conference on Ancient Indian Knowledge: Science and Technology”, <i>National Council of Educational Research and Training, New Delhi</i> .

2018	Awarded Kishore Vaigyanik Protsahan Yojana (KVPY) 2017 Fellowship by <i>Govt. of India</i> .
2018	Offered Innovation in Science Pursuit for Inspired Research (INSPIRE) 2017 Scholarship by <i>Govt. of India</i> .
2016	Awarded ISCA Travel award by <i>Infosys Foundation</i> .
2014-16	Participated in 103 rd Indian Science Congress held at Mysore, India.
2016	Participated in IRIS science fair organised by <i>Intel</i> 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: • Shell • Python • LabVIEW • Matlab • JavaScript • L^AT_EX • 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)

List of Referees

1. PROF. KARTIKESWAR SENAPATI
Associate Professor
School of Physical Sciences
National Institute of Science Education and Research,
Bhubaneswar – 752050, Odisha, India.
Email: kartik@niser.ac.in
2. DR. DHAVALA SURI
Assistant Professort
Centre for Nano Science and Engineering (CeNSE),
Indian Institute of Science,
Bangalore, Karnataka, India.
Email: dsuri@iisc.ac.in

3. PROF. RAM SHANKER PATEL

Associate Professor

Department of Physics

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