ASHWIN KUMAR K

Contact

ashwinkumar.k.rao@gmail.com, f20171034@goa.bits-pilani.ac.in , ashwinschronicles.github.io

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 condensed matter physics (Device Physics).

Interfacing sensors with microcontrollers (Arduino, Raspberry Pi,or other equivalent platform), Power management, electrical drive system, Instrument design.

Solving real-world problems using Distributed Ledger Technology.

Projects and Experiences

Past Projects

• 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*.

• 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

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

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

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

Honors and Awards

2019 National top 30 in NGPE-19 exam (out of 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*.

2016 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").

Articles and Publications

Review articles on scientific and hobbyist instruments on element14.com

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

Relevant Coursework

Physics : •Computational Physics •Masters thesis on fabrication and characterization of Josephson junctions •An introduction to DFT • Electromagnetic theory I&II • Classical Mechanics • Statistical Mechanics • Quantum Mechanics I&II • Non-Linear Dynamics • Nanotechnology and Nanosensors, Part1&2 - Israel Institute of Technology (Coursera) •Topology in Condensed Matter: Tying Quantum Knots - DelftX University (edx) • Quantum Information and Computing • Solid State Physics •Atomic and molecular Physics • Nuclear and Particle Physics • Quantum Information Theory

Electronics : • Object Oriented Programming • Introduction to High-Performance and Parallel Computing - University of Colorado Boulder (Coursera)• Introduction to Data Science in Python-University of Michigan (Coursera) • Microelectronics • Microprocessors and interfacing • Digital circuits • Electric Machines • Specialisation on Semiconductor Devices - University of Colorado Boulder (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

Skills

Computational: • Shell • Python (automation and data analysis) • LabVIEW • Matlab • JavaScript •LaTeX • C++ • Git • Verilog • 3D CAD modeling (Fusion 360) • PCB Design (Eagle CAD)

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

List of Referees

1. Dr. Dhavala Suri
   Postdoctoral Scientist
   Technische Universität München,
   Garching, 85748, Germany
   Email: d.suri@tum.de

2. Prof. Ram Shanker Patel
   Associate Professor
   Department of Physics
   Birla Institute of Technology and Science Pilani - K K Birla Goa Campus,
   Zuarinagar – 403726, Goa, India.
   Email: rsp@goa.bits-pilani.ac.in

3. Prof. Kartikeswar Senapati
   Reader F
   School of Physical Sciences
   National Institute of Science Education and Research,
   Bhubaneswar – 752050, Odisha, India.
   Email: kartik@niser.ac.in