ARAVIND MURALEEDHARAN

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EDUCATION

Purdue University

Ph.D. in Electrical and Computer Engineering — *GPA: 4.0 / 4.0*
2024 - Present
- Areas of interest: Communication Networks
- Key courses: Radar, Digital Communication

Indian Institute of Technology, Kanpur

M.S. (by Research) in Electrical Engineering — *CGPA: 8.01 / 10.0*
2024
- Specialization: Signal Processing and Communication Networks
- Key courses: Wireless Communication, Random Variables and Processes, Convex Optimization, Machine Learning, MIMO, DSP

TKM College of Engineering, Kollam

B.Tech (Hons) in Electronics and Communication Engineering — *CGPA: 8.73 / 10.0*
2019
- APJ Abdul Kalam Technological University (State Govt. University), Kerala, India
- Key courses: Signal Processing, Digital and Analog Circuits, Cyber Security, Computer Networks

Kendriya Vidyalaya, Pattom

School Education — *2015*
- Higher Secondary (XII): 93.8%, Secondary (X): 95% (CGPA 10.0 / 10.0)
- Subjects: Physics, Mathematics, Chemistry, English, Computer Science

SKILLS

Technical Skills
- **Languages** - C, C++, Python, MATLAB, HTML, JS, SQL, Java
- **Protocols** - UART, I2C, SPI, Zigbee, BACnet, BLE, LoRaWAN
- **Hardware** - STM32, NXP, AVR, NRF, JTAG, SWD

EXPERIENCE

Purdue University

Teaching Assistant — *Aug 2024 - Apr 2025*
- TA for ECE362 (Microprocessor Systems and Interfacing Lab) and ECE301 (Signals & Systems).
- Responsibilities included grading, conducting office hours, preparing quizzes, exams, and assignments.

Indian Institute of Technology, Kanpur

Teaching Assistant — *Aug 2022 - Mar 2023*
- TA for ESC201 (Introduction to Electronics).

Self-Employed

Teacher — *Oct 2020 - July 2021*
- Provided tutoring in math, physics and other engineering level subjects during the COVID-19 pandemic.

Tismo Technology, Bengaluru

Software Engineer T1 (Firmware) — *June 2019 - Sep 2020*
- Firmware development on IoT related projects.

DSP Lab, NIT Calicut

Research Intern — *July 2018*
- Implemented improved PCA methods for detecting principal moving objects from video sequences.

Airports Authority of India

Intern — *July 2017*
- Received training on Area, Approach, and Air Traffic Control during aircraft landing and takeoff.
- Conducted an examination of various machines used in air communication and prepared a detailed report.

Kerala State Electronics Development Corporation Limited (KELTRON)

Trainee — *July 2016*
- Gained exposure to manufacturing techniques used in the production of electronic components.

PROJECTS

Academic Research

- **Shaping of Transmission Signals in Molecular Communications** - Master of Science by Research Thesis under Dr. Abhishek K Gupta. Developed a coding scheme for ISI matching in molecular communication systems, enabling communication where traditional wireless methods fail. *Accepted to NCC 2025, India.*
- **Wireless Communication** - Studied Bit Error Rate and SINR in MIMO fading systems. Analyzed Uplink Spectral Efficiency for LOS and NLOS Massive MIMO channels. [Github Repo]

Industry Projects

- **LoRa Sensor Monitor** - Developed a proof-of-concept application for evaluating LoRa technology across three classes, integrating real-time sensor data collection and firmware updates over the air. Tech used: The Things Stack, Microchip LoRa kit.
- **Smart Street Light Control using 3G and Zigbee** - Designed firmware in Java ME for an energy-efficient street light controller.
- **Internet Sharing for Smart Street Light Control** - Engineered a Zigbee-based proprietary mesh network enabling multiple street light controllers to share internet via a 3G-connected master controller.

Personal and Academic Projects

- **An Inexpensive Unmanned Aquatic Vehicle for Underwater Human Detection** - Final year B.Tech project. Developed an autonomous underwater vehicle capable of detecting objects underwater. *Published in AIP Conference Proceedings, 2020.*
- **Bluetooth Enabled Assist Device (BEAD)** - Developed an indoor navigation prototype for visually impaired users, leveraging Android Bluetooth instead of expensive BLE beacons. *Accepted to IEEE TENSYMP 2018.*
- **Autonomous Maze Solver** - Built a robot that navigates mazes using the Pledge Algorithm, competing in tech fests at NIT Calicut and TKM CE (2015).
- **Supermarket Billing Software** - Created an inventory and billing management system as a high school project (2013). [Github Repo]

PUBLICATIONS

Conferences

- *Optimal Transmission Sequence Design with ISI Matching in Molecular Communication* -
  Aravind Muraleedharan and Abhishek K. Gupta. Accepted to NCC 2025, India (Dec 2024).
- *An Inexpensive Unmanned Aquatic Vehicle for Underwater Human Detection* - M. Aravind, M. N. Shafi, P. Ashik, K. Sudheesh, and A. Romal. Published in AIP Conference Proceedings, vol. 2222, AIP Pub., 2020.
- *Unmanned Aquatic Vehicles for Underwater Human Detection and Possible Challenges* - Poster Presentation at the International Conference On Microelectronics, Signals And Systems 2019, Kollam, India.
- *Bluetooth Enabled Assist Device (BEAD)* - M. Aravind, B. Supreeth. Accepted for oral presentation at IEEE TENSYMP 2018, Sydney, Australia.

Journals

- *Invited Reviewer* - Springer Nature's *Sádhaná* Journal, Indian Academy of Sciences (Jan 2024).
- *Optimal Transmission Sequence Design in Molecular Communication for ISI Matching* - Work in progress, expected submission in 2025.

Seminars

- *Microchip Masters Conference, Bengaluru (2019)* - Represented Tismo Tech. Pvt Ltd as a corporate delegate.
- *NOMA in 5G* - Undergraduate pre-final year seminar (2017).

LEADERSHIP & COMMUNITY SERVICE

IIT Kanpur

- **Senate Representative (2022)** - One of six student nominees to the Academic Senate, responsible for overseeing institutional policies and decision-making. Actively contributed to student-related proposals.
- **Scholarships and Prizes Committee Member (2022)** - Conducted interviews and selections for various awards as a student panelist.
- **Vice President, Toastmasters Club (2022)** - Led public relations initiatives, increasing the club's visibility and participation.
- **Secretary, Photography Club (2022)** - Organized events, workshops for 3k+ postgraduate community.

- **PG Core Team Member, Institute Counselling Service (2022)** - Assisted in student mental health initiatives and coordinated the Orientation for 1500+ fresher postgraduate students.
- **Mathematics Teacher, Prayas NGO (2023)** - Volunteered to teach Mathematics to 11th-grade students.

TKM College of Engineering
- **Co-founder, Space it Lab (2019)** - Established a technical lab for student-initiated projects.   [Newspaper]
- **Co-founder, Automation & Robotics Club (2018)** - Initiated a club for automation and robotics-based projects.
- **National Service Scheme Volunteer (2018)** - Contributed to making emergency power banks and lights for families affected during the Kerala floods.
- **Student Member and Volunteer (2017)** - Actively participated in IEEE, ISTE, and IETE events and initiatives.

Kendriya Vidyalaya Pattom
- **School Captain, Vice Captain, and Council Member (2015)** - Held multiple leadership roles throughout schooling, including sports captain and prefect, for a record seven times.

EXTRA-CURRICULAR

- **Athletics** - Regular participant in 5K running and 50K cycling events.
- **Quiz Enthusiast** - 1st place in Inter-KV All Kerala Quiz Competition (2014) and various other quiz contests.
- **Carnatic Musician** - Professionally trained Mridangam player since 2007. Performed at school, college, and office events. Also played Ukulele, Guitar, Keyboard, Tabla, and Cajón for different occasions.
- **Hobbies** - Passionate about bike riding, photography, acting & theatre, music, astronomy.

KEY AWARDS & RECOGNITIONS

- **General Grade Amateur Radio License Holder** - Call sign: **VU2LWH**, issued by Wireless Planning and Coordination Wing, Ministry of Communications, Govt. of India.
- **University Honors** - Awarded for completing additional Master's level coursework credits with B.Tech.
- Achieved O[S] grade (90% and above) in all undergrad math courses.
- **Google Science Fair Regional Finalist** - Asia Pacific finalist in 2012 and 2013, securing a spot among the top 30 projects worldwide in the 14-16 age category.
- **Certificate of Merit, KV Sangathan** - Awarded a cash prize for excellence in AISSE (Xth exam) (2013).
- **Proficiency Test Scores**:
  - *IELTS*: Band 7.5 (Reading 8.5), GRE: 310 (Quantitative: 162)
  - *Purdue OEPT*: Secured 55/55
  - *GATE* All India Rank: 579
- **MHRD Scholarship** - Fully funded Master's studies at IIT Kanpur, awarded by the Government of India.