




ARAVIND MURALEEDHARAN

~ Curriculum Vitae ~

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MOTIVATION

Motivated researcher with a passion for innovation in Signal Processing, Wireless Communication, Internet of Things, Artificial Intelligence, and Cyber-Physical Systems.

Committed to pushing the boundaries of technology to solve complex challenges and drive advancements by leveraging my strong academic foundation and hands-on experience to contribute meaningfully to cutting/bleeding-edge Research & Development projects.

TECH SKILLS

Languages: C/C++, Python, MATLAB, HTML, JS, SQL, Java

Protocols, UART, I2C, SPI, Zigbee, BACnet, BLE,

Hardware: LoRaWAN, JTAG, SWD, Boards-STM32, NXP, AVR, NRF

EDUCATION

August 2024 -	Doctor of Philosophy in Electrical & Computer Engineering	Purdue University, USA
August 2024	Master of Science (by Research) in Electrical Engineering Specialization: Signal Processing and Communication Networks Department of Electrical Engineering, IIT Kanpur Key Courses: Wireless Communication, Random Variables and Random Processes, Convex Optimization, Linear Algebra, DSP, Machine Learning, 5G, MIMO CGPA: 8.01/10.0	Indian Institute of Technology, Kanpur, India
August 2019	Bachelor of Technology (Hons) in Electronics and Communication Engineering APJ Abdul Kalam Technological University, Kerala, India Key Courses: Signal Processing, Digital and Analog Circuits, Cyber Security, Computer Networks CGPA: 8.73/10.0	TKM College of Engineering, Kollam
May 2015	School Education Central Board of Secondary Education (CBSE) Higher Secondary (XII): 93.8% , Secondary (X): 95% (CGPA 10.0/10.0) Subjects: Physics, Mathematics, Chemistry, English, Computer Science	Kendriya Vidyalaya Pattom

PROJECTS & RESEARCH EXPERIENCE

2023	Shaping of Transmission Signals in Molecular Communications • Master of Science by Research Thesis • Molecular communication aims to make communication possible in areas where wireless communication fails, a significant use case being the facilitation of communication between bio-nano robots inside the human body. I worked on creating a coding scheme for ISI matching across symbols for molecular communication systems.	Thesis Supervisor: Dr. Abhishek K Gupta
2021	Course projects • Wireless Communication (EE670A), MIMO Wireless Communication (EE677A), IIT Kanpur • Analysed Bit Error Rate and Signal to (Interference+Noise) Ratio for multiple antenna fading systems. • Uplink Spectral Efficiency for line of sight and non-line of sight Massive MIMO channels for multi-cell systems. Languages: Python, MATLAB. Codes at: Github Repo	Dr. Aditya K. Jagannatham, Dr. Rohit Budhiraja
2020	LoRa sensor monitor Individually developed a proof of concept application for evaluating LoRa technology in all the 3 classes, where LoRa communication with real-time data collected from sensors is demonstrated, with a feature for firmware update over the air. Tech used: The Things Stack and a Microchip LoRa kit	Tismo Tech.
2019	Smart street light control using 3G and Zigbee Worked on the firmware development (in Java ME) of a street light controller which has features designed to maintain energy efficiency.	Tismo Tech.
2019	Internet sharing for Smart street light control using Zigbee As part of a team, got a chance to work on a proprietary mesh technology that enables many street light controllers to exchange information via Zigbee with one main controller (switchable) which has 3G internet connectivity so that the internet connectivity is now virtually shared among all the controller devices.	Tismo Tech.

2019	An inexpensive Unmanned Aquatic Vehicle for Underwater Human Detection <ul style="list-style-type: none"> • 8th semester B.Tech final year project • Developed a low-cost working model of an underwater vehicle that is capable of performing object detection underwater while working autonomously. • Published a paper with the same title in American Institute of Physics Conference Proceedings, Volume 2222, Issue 1, article id 040015(2020). 	Asst. Prof. MN Shafi
2016	Bluetooth Enabled Assist Device (BEAD) <ul style="list-style-type: none"> • 4th semester summer project • Devised a prototype model for assisting indoor navigation for visually challenged people. • Innovatively used multiple Android phones' Bluetooth feature, instead of relying on the then-costly BLE beacons for indoor mapping and developed an application to trigger the handheld device for direction advice. • Paper was accepted in IEEE TENSYP 2018, Sydney, Australia but could not participate. 	Sophomore year project
2015	Autonomous Maze Solver <p>The project was made for a tech event where we, as a group of 2, implemented a modified version of the Pledge Algorithm to make a robot that travels through a maze, finding its way to exit. The testing maze we made consisted of styrofoam walls and the robot relied on ultrasonic sensors to detect walls. The project participated in tech fests of NIT Calicut and my college.</p>	Freshman Project
2013	Supermarket Billing Software <p>As a hobby project while learning C, I developed billing software that performed basic operations such as storing items, management, and preparing invoices. The work was then submitted for the high school final year project. Codes are available at: Github Repo</p>	11th grade high school project

SEMINARS AND PUBLICATIONS

2024 Jan 2024 (exp)	Invited Reviewer for Springer Nature's Sādhanā Journal, by the Indian Academy of Sciences M. Aravind, AK Gupta, Optimal Transmission Sequence Design in Molecular Communication for ISI Matching [work in progress]	Journal Journal
2020	An inexpensive unmanned aquatic vehicle for underwater human detection M. Aravind, Shafi, M. N, P. Ashik, K. Sudheesh, and A. Romal. "An inexpensive unmanned aquatic vehicle for underwater human detection." In AIP Conference Proceedings, vol. 2222, no. 1. AIP Publishing, 2020	Conference Paper
2019	Unmanned Aquatic Vehicles for underwater human detection and possible challenges International Conference On Microelectronics, Signals And Systems 2019, Kollam, India 27–28 September	Poster Presentation
2019	Microchip Masters Conference, Bengaluru Attended Microchip Masters Conference, Bengaluru 2019, representing Tismo Technology Pvt Ltd.	Corporate representative
2018	Bluetooth Enabled Assist Device (BEAD) M. Aravind, B. Supreeth, "Bluetooth Enabled Assist Device (BEAD)", IEEE TENSYP 2018, Sydney, Australia, (Paper accepted for oral presentation)	Conference paper
2017	Noma in 5G	Undergraduate pre-final year seminar

WORK EXPERIENCE

Aug/2024 Dec/2024	Teaching Assistant TA for the course ECE301, Signals & Systems. Work included the creation, correction, grading, and maintaining marks of quizzes, exams & assignments, and holding office hours	Purdue University
Mar/2023 Aug/2022	Teaching Assistant TA for the course ESC 201, Introduction to Electronics. Work included the correction, grading and maintaining marks of quizzes.	IIT Kanpur
July/2021 Oct/2020	Teacher Taught and helped students of high school (Math and Physics) and Engineering (Electronics, Communication) during the COVID-19 Pandemic.	(Self employed)
Sep/2020 June/2019	Software Engineer T1 (Firmware) <ul style="list-style-type: none"> • Corporate work experience in developing wireless communication projects for Internet of Things. • Software development experience in C and java ME. • Board bring-up experience with UART, SPI and I2C, with added expertise in Zigbee, BLE and LoRa. • Attended Microchip Masters Conference, Bengaluru 2019, representing the firm. 	Tismo Technology, Bengaluru, Karnataka
July 2018	Research Intern Worked on implementing improved PCA methods for detecting principal moving objects from video sequences. PI: Dr. Sudhish N George, NIT Calicut	DSP Lab, National Institute of Technology, Calicut, Kerala

July 2017	Intern Received training on Area, Approach, and Air Traffic Control during landing and take off of aeroplanes. Conducted a comprehensive examination of various machines employed in air communication and compiled an extensive report summarizing my findings.	Airports Authority of India
July 2016	Trainee As a freshman, I chose to participate in this industrial training to acquire exposure to various manufacturing techniques employed in the production of electronic components. Keltron is the Kerala State Electronics Development Corporation Limited.	Keltron Kerala

LEADERSHIP & COMMUNITY SERVICE

2023	Mathematics Teacher, Prayas (NGO) I teach Mathematics to 11th-grade students	IIT Kanpur
2022	Student nominee to Institute Senate, IITK I was one of the six special invitees to the Academic Senate at IIT Kanpur, which serves as the highest governing body responsible for overseeing institutional policies and decision-making. In this role, I played a key part in formulating proposals on behalf of the student community and served as their representative within the Senate.	IIT Kanpur
2022	Student nominee to Scholarships and Prizes Committee, IITK I was entrusted as a student panel member in the Senate Scholarships and Prizes Committee where I managed and helped in the overall conduct of interviews for selection of students for various awards instituted by the college.	IIT Kanpur
2022	Vice President, Public Relations, Toastmasters Club IITK I served as the inaugural Vice President of the Toastmasters Club at IIT Kanpur, where my responsibilities encompassed enhancing the club's visibility and bolstering its reputation among the college community. Additionally, I garnered recognition as the standout speaker and role-taker in numerous meetings.	IIT Kanpur
2022	Secretary, Photography Club IITK I served as the sole secretary for the entire postgraduate student body, which consisted of approximately 3,000+ individuals. My responsibilities included organizing events and workshops for the campus community.	IIT Kanpur
2022	PG Core Team Member, Institute Counselling Service Part of a team of Counselors and Mental health professionals to help students overcome stress and other difficulties during their time in the institute. Organized workshops and lectures on Mental health. Organized Orientation (Welcoming/Freshers) for 1500+ PG students. Web development head.	IIT Kanpur
2019	Co-founder, Space it lab I was the co-founder of Space it Lab, a college initiative to open a technical laboratory for supporting and development of student-initiated projects, aimed at preparing and elevating students to the industrial requirements. [Newspaper report]	TKM CE (during B.Tech)
2018	Student member, National Service Scheme Made power banks, and emergency lights and volunteered in making kits for providing to families affected during the 2018 Kerala floods.	TKM CE (during B.Tech)
2018	Co-founder, Automation & Robotics Club	TKM CE (during B.Tech)
2017	Student member and volunteer, IEEE, ISTE, IETE	TKM CE (during B.Tech)
2015	School Captain, School Vice Captain, School Council Member for multiple tenures	Kendriya Vidyalaya Pattom

- In school, I served in leadership positions in different roles like sports captain, prefect, and house captain for a record 7 times from primary school through higher secondary. In IIT K also, I could contribute to various short-term committees related to college matters, apart from the commitments I already mentioned.

EXTRA-CURRICULAR ACTIVITIES

- Athletics: Frequent participant in 5K running and 50K cycling events.
- Quiz enthusiastic: 1st in Inter-KV All Kerala Quiz Competition (2014) and various other quiz competitions.
- Professionally trained (since 2007) Mridangam player (Carnatic Music) and have played in school, college and office events. Also played Ukulele, Keyboard, Tabla, and Cajón for different events.
- Loves Bike Ride, Photography, Acting & Theatre, Art & Music, and Amateur Astronomy.

KEY AWARDS & RECOGNITIONS

- Holder of General Grade Amateur **Radio License** (Call sign: **VU2LWH**), issued by Wireless Planning and Coordination Wing, Ministry of Communications, Govt. of India.
- Secured O[S] grade (Scored above 90%) in **all** mathematical subjects in the undergraduate curriculum.
- Secured (**Hons.**) from university for completing additional Master's level coursework credits within B.Tech course span.
- **Google** Science Fair Regional **Finalist**, Asia Pacific: 2 times consecutive during **2012** and **2013**, for presenting one among the **top 30** projects **worldwide** in the age category 14-16.
- Certificate of Merit, cash award from KV Sangathan for **excellence** in AISSE (Xth standard board examination) (2013).
- Proficiency Test Scores: *IELTS*: Band 7.5 (Reading 8.5), GRE: 310 (Quants: 162), *Purdue OEPT*: Secured 55/55.
GATE All India Ranks: 579 (Instrumentation Engineering), 1935 (Electronics and Communication Engineering.).
- Secured complete funding for my Master's studies at IIT Kanpur from MHRD, Government of India.