Aravind Reddy V

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EDUCATION

International Insitute of Information Technology, Bangalore (IIITB) 2015 - 2020
5-year Bachelors + Masters degree in Electronics and Communication Engineering. M.Tech CGPA: 3.66/4

THESIS

Decimeter level indoor localisation with a single router Summer, 2020
For my M.Tech Thesis, I built a WiFi-CSI based indoor positioning system that achieves a resolution of 10 cm using a single off-the-shelf WiFi Router and a device with a BCM43455c0 chip, like a Raspberry Pi 3B+ or above.

PUBLICATIONS

Decimeter Level Indoor Localisation with a Single WiFi Router using CSI Fingerprinting
Aravind Reddy V, Vikas Vazhiyal, Madhav Rao, et.al Accepted: *IEEE Wireless Communications and Networking Conference*, March 2021.

Design and Development of a Flexible Robotic Operative Microscope for Neurosurgical Applications
Aravind Reddy V, Vikas Vazhiyal, Madhav Rao, et.al in *42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2020.

Design and Development Of A Flexible Robotic Operative Microscope for Neurosurgical Applications
Aravind Reddy V, Vikas Vazhiyal, Madhav Rao, et.al in *IEEE ICMA 2020*

Mythri 1.0 - Progress of an Indian Surgical Robot
Aravind Reddy V, Vikas Vazhiyal, Madhav Rao, et.al in *Indian Journal of Neurosurgery*, March 2020.

CURRENT RESEARCH

Practical Fingerprinting based Localisation using WiFi CSI and Particle Filtering.
Localisation using Fingerprinting is data and effort intensive. A modified form of particle filtering can be used to substantially reduce the number of fingerprints needed for precise localisation.

Low Power, Wireless, Sensor Nodes for Precision Agriculture
Low power, inexpensive, wireless sensor network nodes for deployment in agriculture by the Govt. of Karnataka. I'm designing a Raspberry Pi 0w based embedded device, and protocols to safely and efficiently transfer sensor data for processing.

RESEARCH INTERNSHIPS

The University of Alabama Summer, 2019
Design and development of a low-power, Bluetooth-Low-Energy embedded sensor system to measure energy intake in infants.

Surgical and Assistive Robotics Lab, IIITB Summer, 2018
Design and development of a WiFi-RSSI based indoor positioning system with a resolution of 4 metres to find and report positions of Dementia patients at NIMHANS Bangalore.

Surgical and Assistive Robotics Lab, IIITB Summer, 2017

Designed and built a surgical snake robot for use in Neuro-surgeries and minimally invasive cardiac surgeries with NIMHANS.

SELECTED PROJECTS

Satellite Reception System Summer, 2020
This is an ongoing project. I'm building a satellite reception system at my home with an RTL-SDR and a home made antenna. So far, I have successfully decoded signals for NOAA 15, 18, 19, Meteor M-2 weather satellites, and a few cube-sats.

Python to ARM assembly compiler Winter, 2018
As a course project, my friend and I built a rudimentary compiler to transform a small subset of Python syntax to ARM Assembly.

Visible Light Communication System Summer, 2017
We built a system and designed a protocol to send and receive data by modulating light using two 555 timers and no micro-controllers.

Cellular based Remote Irrigation System Winter, 2016
For my first ever electronics project, we made a low cost ($10) phone controlled system to control agricultural motors. By exploiting the components already present in built-in motor starters, this costs less than 1/5th the price of alternatives commercially available in India.

OTHER RESEARCH

Deploying Agile Wireless Networks with Unmanned Aerial Vehicles 2018, at IIITB
An investigation into the use of Drones and other UAVs to deploy agile wireless networks and provide robust connectivity, and analysis of 3D placement topologies for maximum network efficiency.

PATENTS

A Flexible Surgical Device July, 2017
IIIT-B applied for a patent for the Flexible Surgical Probe I designed at Surgical and Assistive Robotics lab (SARL) in collaboration with National Institute for Medical Health and NeuroSciences (NIMHANS). Indian Patent Application No: 201741024666

WRITING

An algorithm for efficient decoding of Hamming(7,4) codes Feb, 2017
A processor-cache-friendly matrix-operation based algorithm to decode Hamming(7,4) Forward Error Correction encoding.

TEACHING EXPERIENCE

EC201: Basic Electronics, EC202: Electronic Devices and Circuit Theory
Aug 2018 - Dec 2019
I have been the Teaching Assistant for these courses for the past 4 semesters. 96% of the student feedback said they would like me to be the TA again for the next semester.

GNUplot guide Aug, 2018
To help my students plot better graphs, I wrote a tutorial for GNUplot. It's part of the course website I designed for them. https://belab.netlify.app/guides/gnuplot/0/0.html

MISC.

Uikit with VueJS — Vue cli 3 Oct 2018
My guide on using UIKit with VueJS, is published in the Oct 2018 newsletter of VueJS. https://bit.ly/2PDqqZt

A Trip Down Memory Lane 2018
My article on the evolution of memory devices over the years is published in 8BIT, the IIITB University Magazine.

Internet Committee 2017 - Now
I've been leading the Internet Committee at IIITB. We make pages and applications for IIITB, debug network errors, and manage network related tickets from students.

TECHNICAL SKILLS

***Programming**: C, Python, C++, Java, Matlab, NodeJS*
***Hardware**: Arduino, RaspberryPi, Intel Galileo, ESP8266, ESP32, Nordic nRF52832, nRF52840*
***Frameworks**: Scikit-learn, Numpy, Pandas, Nexmon*
***Web development and design**: Vue, Vite, Tailwind CSS, Webpack*

REFERENCES

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Dr. Vikas Vazhayil
National Institute of Mental Health and Neuro-Sciences,
email: *vikas.drv@gmail.com*