

# Varun Ganjigunte Prakash

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## EDUCATION

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### Bachelor of Engineering in Electronics and Communication

*Sri Jayachamarajendra College of Engineering*

GPA: 8.47/10.0

Aug 2014 - May 2018

*Mysuru, India*

## WORK EXPERIENCE

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### Machine Learning Engineer - Computer Vision

*CogniAble*

March 2021 - Present

*Bengaluru, India*

- Trained and deployed a custom action recognition deep network for recognizing children's behaviors.
- Implemented ML classifiers for neurodevelopmental disorder patients' treatment personalization and skill enhancement (classical, recommender systems, and graph models).
- Developed object classifiers and trackers for children's skill recognition in clinical settings.
- Led and managed the development of computer vision models in production (9 models).
- Implemented large-scale data processing, model training, and inference pipelines. Managed a team of data engineers and clinicians.
- Researched and implemented several novel computer vision approaches for clinical screening.

### Engineer

*L&T Technology Services*

June 2018 - March 2021

*Bengaluru, India*

- Developed three computer vision-based software applications for edge inference products for a leading customer in AI and semiconductors.
- Proposed and implemented improvements to existing computer vision frameworks.
- Software development for a medical sterilization product in C++ and Lua.
- Explored facets of AI subsets and proposed solutions (POC) to establish strong customer relationships from ideation to realization.
- Demonstrated the applicability of AI and initiated efforts to implement AI in the semiconductor industry.
- Designed and implemented an OCR pipeline for HMI screen automation (2x time savings).
- Developed and evaluated performance enhancements for customer's deep models using the OpenVINO.
- Taught engineers about deep learning for computer vision and its applications.
- Collaborated to assist teams in resolving software problems and simplifying them through automation.
- Implemented an auto-scripting code that generates codes (Software 2.0), which reduced manual tasks from hours to minutes (10x faster). Some code implementations were effective, and the unsuccessful ones taught me valuable lessons.
- Stood out among the few hundreds of software development and testing teams in the transportation business unit as the only one willing to automate and accelerate software processes using open-source tools.
- Improved several business processes with computer vision-based automation. Automated most simple, repetitive tasks yet time-consuming in project development and delivery.

### Computer Vision Intern

*Skylark Drones*

Feb 2018 - May 2018

*Bengaluru, India*

- Researched and developed tools for an aerial image overlap checker to address drone terrain variation issues.

### Embedded Systems And Wireless Network Intern

*LogicHive Solutions*

June 2016 - Dec 2016

*Mysuru, India*

- Worked on various projects that involved multifarious sensors to implement practical applications with Ethernet, Bluetooth, WiFi, and other networking principles.

- Developed a few real-world wireless applications for GPS geo-fencing with ZigBee, robot control, RF communication, and an electronic liquid measuring scale.

## PROJECTS

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### Behavior-aware robot navigation with deep reinforcement learning

- Implemented a human behavior-aware crowd navigation model utilizing the DRL algorithm with enhanced risk awareness, safety, and understanding of the environment for robot navigational decisions.

### 6-DOF pose estimation, planning, and control

- Designed a custom 4-axis robotic arm, implemented it, and simulated it in ROS.
- Tested the custom built manipulator for 3D object grasp with deep learning.

### Indian currency recognition and food classifier application

- Implemented a deep model for currency recognition and deployed it as an Android mobile application.
- Developed a deep model that classifies and discovers related information about the 20 most common Indian food items, such as the nearest restaurants where they are available and the item's cost.

### Autonomous mobile manipulator robot: Dexterous Service Robot

*Advances in Robotics, 2019*

- Designed a home assistant robot to assist differently-abled and elderly persons by performing some of the common tasks involved in daily life.
- Implemented the objectives using a robot (DEXTER ER-2) mounted on a mobile vehicle that operated using voice commands to selectively search for and deliver the object required by the user.

### Robot to sort objects

- Implemented code to sort different sized objects based on color with a robotic arm (DEXTER ER-2). The algorithm used basic image processing and inverse kinematics concepts.

### Robot to pick and deliver objects

- Designed and implemented object delivery behavior for a robot based on the shape, size, and color of the objects.
- Implemented perception algorithms to analyze objects and obstacles and plan paths.
- Evaluated objectives using the Fire Bird V robot with a mounted custom designed gripper to pick and deliver objects.

### Miscellaneous

- *Biomorphic Hyper-redundant Snake Robot* (Oct 2017 – Jan 2018): Designed and built a robot resembling a snake in Autodesk Fusion 360. Simulated different gaits such as serpentine, caterpillar, and side-winding motion in V-REP (now CoppeliaSim). The project was a part of the e-Yantra robotics competition in 2018.
- Implemented transmitter and receiver codes with an encrypted communication system (Morse code) for information communication and validated them on two Zigbee modules.

## PUBLICATIONS

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- “Deep Learning-Based Human Action Recognition Framework to Assess Children on the Risk of Autism or Developmental Delays”, Manu Kohli, Arpan Kumar Kar, **Varun Ganjigunte Prakash**, Prathosh A. Prasad, *International Conference on Neural Information Processing (ICONIP), Communications in Computer and Information Science (CCIS), Springer, 2023*
- “Video-based real-time assessment and diagnosis of autism spectrum disorder using deep neural networks”, **Varun Ganjigunte Prakash**, Manu Kohli, Prathosh A. Prasad, Monica Juneja, Manushree Gupta, Smitha Sairam, Sadasivan Sitaraman, Anjali Sanjeev Bangalore, John Vijay Sagar Kommu, Lokesh Saini, Prashant Ramesh Utage and Nishant Goyal, *Expert Systems, Wiley Online Library, 2023*
- “Behavior-Aware Robot Navigation with Deep Reinforcement Learning”, **Varun Ganjigunte Prakash**, *IEEE 6th International Conference on Computation System and Information Technology for Sustainable Solutions (CSITSS), 2022*

- “Autonomous Service Robot”, Arshad Javeed, **Varun Ganjigunte Prakash**, Sudarshan Patilkulkarni, *Advances in Robotics (AIR 2019) – ACM ICPS, 2019*

## TECHNICAL SKILLS

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<b>Languages:</b>	Python, C++, MATLAB, C, Embedded C
<b>Libraries and Tools:</b>	OpenCV, Keras, TensorFlow, scikit-learn, PyTorch, ROS, OpenAI Gym, Git
<b>Miscellaneous Interfaces:</b>	Jetson Nano, Raspberry Pi, custom mobile robots, and robotic arms

## ACCOLADES AND LEADERSHIP

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- Completed *DELF B1* (Advanced) certification for a Diploma in French Language administered by the International Centre for French Studies for France’s Ministry of Education.
- Contributed to the improvement of the quality of peer-reviewed publications by reviewing 2 manuscripts for Biomedical Signal Processing and Control, Elsevier, and 1 manuscript for the International Journal of Machine Learning and Cybernetics, Springer.
- Worked as a *Omdena* collaborator (ML Engineer) to solve the renewable energy AI challenge for African communities.
- Received a certificate of participation for the implementation of the theme ‘Launch a Module’ in the 2016 e-Yantra Robotics Competition 2016.
- Co-led the team to come up with a full-fledged product that can raise the standard of living in our society in six months. Our project, “Dexterous Service Robot,” was one of the top seven finalists in the Anveshan Fellowship 2018, organized by Analog Devices, and my team did a real-time demo at the event.
- Presented a paper entitled “Colour based Object Sorting Robotic arm using Image Processing” in *National Conference on Robotics, Automation, Control and Embedded Systems (NCRACES-2017)*.
- Led a team for the 2017 e-Yantra Robotics Competition and other robotics projects at the e-Yantra Robotics Lab at SJCE.
- Volunteered to teach children at the U&I charitable organization. Received the “Best Teacher of the Year 2019-20” recognition.
- Volunteered in the technical activities of the IEEE-SJCE student branch for the years 2015-2018.

## LANGUAGES

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- French (fluent, B1), English (fluent), Kannada (native), Hindi (beginner)