



## Rahul Ranjan

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A researcher with a master's degree, interested in collaborative robots, mobile robots, humanoid robots, human-robot interaction, machine learning, and deep learning. Familiar with C, C#, Python, ROS, etc., Work experience in electronics hardware design and embedded integration. Currently working on collaborative robots for mass cooking, soup-making, coffee making, integrating with safety sensors, developing robot-PC communication systems, and conducting system integration and performance testing in real-world environments for the Korean kitchen. Actively seeking opportunities to contribute to robotics and technology.

## Education:

### Sun Moon University, South Korea (M.S)- 2022-2024

M.S in computer science and Electronics Engineering with 4.30/4.5

### SRM University, Chennai, India (B. Tech)- 2014 -2017

Bachelor of Technology in Electronics & Communication Engineering with (6.95/10) CGPA

### SRM Polytechnic College, Chennai, India (Polytechnic)- 2011-2014

Electronics & communication with (84.86 / 100) %

### SRT Public school, CBSE (Primary)- 2011

Matriculation School (10th Std) With (7.20/10) CGPA

## Research Interests:

**Robot Control and Teaching:** Robot control and teaching; Localization; Mapping; SLAM (Simultaneous Localization and Mapping); Path planning; Obstacle avoidance; Autonomous navigation.

**Intelligent Robot & Vehicle:** Collaborative robot; UGV (Unmanned Ground Vehicle); Mobile Robot Manipulator.

**Robot Vision & Artificial Intelligence:** Human-following Robot, Image Processing, Machine Learning, Deep Learning, Camera Vision.

## Awards and Honors:

- **India International Innovation and Invention Expo (Dec. 2021)**

Awarded as a GOLD MEDAL for best prototype innovation by International Innovation Association (IIA), India.

- **International Innovation Fair (Dec. 2019)**

Awarded as a GOLD MEDAL for best prototype innovation by International Innovation Association (IIA), India.

- **INTINTA Innovator by Telangana State Government India. (Aug. 2019)**

Selected as INTINTA INNOVATOR by Telangana State Innovation Cell (TSIC), Telangana State Government India.

- **INDIA STAR BOOK (2019)**

Awarded as INDIA STAR YOUTH ICONIC AWARD-2019 by INDIA STAR BOOK.

- **Best Paper Award, (Apr. 2017)**

The award for best paper from Elsevier/Scopus in 7th International Conference on Science and Innovative Engineering paper, Titled- Design and Development of Wall Climbing Swarm Robot at Jawahar Engineering College, Chennai, India.

- **Best Innovative Idea in Student's special symposium, (2016)**

Awarded as Best Innovative Idea in Student's special symposium, LAMSYS-2016 held at SDSC SHAR, ISRO, SRIHARIKOTA, India.

- **Witness of live launching of PSLV-35, (2016)**

Invited to witness of live launching of PSLV-35 from MR KURUP AUDITORIUM, SDSC SHAR, and ISRO SRI HARIKOTA.

- **Virtual BAJAJ SAEINDIA, (2016)**

Participated in virtual BAJA SAEINDIA -Organized by SAEINDIA at CHRIST University, Bengaluru India.

- **INDO-US Robo League, (2015)**

Participated at the zonal round in "INDO-US ROBO LEAGUE" held at IIT Mumbai, India.

- **Robo Sumo, (2015)**

Won 2nd place in ROBO SUMO event of TECHNOSUMMIT held at SATHYABAMA University, Chennai, India.

- **Third position in IPPA Division Tournament**

Played as a member of Cricket Team who was the Third Position in IPPA Division Tournament, Directorate of Technical Education, Inter Polytechnic Athletic Association, and Government of Tamil Nadu, India.

- **BAL Olympiad-District Level Boxing Championship, (2010)**

Played Awarded as GOLD MEDAL and SILVER MEDAL in BAL OLYMPIAD- District Level Boxing Championship.

## **Appointments:**

**Robotics Researcher**, HANKOOK ROBOTICS, Seoul, South Korea | Sept 2024| Present

**R&D Researcher**, SEOCHANG TECH CO., LTD, Cheonan, South Korea | Jan 2024| Oct 2024

**Research Scholars**, INTELLIGENT ROBOT RESEARCH LAB, (IRRI Lab), Asan, South Korea | March 2022- Dec 2023

**Senior Robotics Engineer**, SPEARSOFT TECHNOLOGIES PVT LTD, Hyderabad, India | June 2021 - Feb 2022

**Robotics Engineer**, IMMERSIVE GAMITRONICS STUDIO PVT LTD, Hyderabad, India | Dec 2017 - Apr 2021

**Robotics Research Associate**, EPR Labs, Chennai, India | Jun 2017 - Dec 2017

## **Work Experience:**

**Robotics Researcher:** October 2024 ~ Present

Hankook Robotics, Seoul, South Korea.

- **Projects:**

- 1. Side Dish Tray Pre-Distribution Robot System**

- Developed and deployed a **robotic tray pre-distribution system** for side dishes.
- Project delivered to **Samsung Electronics K-TF, Suwon.**

- 2. Robot Coffee System**

- Delivered a fully automated **robot coffee-making system** to improve efficiency and consistency in beverage preparation.
- Successfully implemented at **Samsung Electronics K-TF, Suwon.**

- 3. Mass Cooking Robot for School Meals**

- Delivered a **large-scale cooking robot system** for Incheon high and middle schools' midday meals.
- Utilized the **Doosan H2017** robot for automating bulk cooking processes.

#### 4. Kuk-bap Soup-Making and Delivery Robot

- Developed and deployed an **automated Kuk-bap soup-making and delivery system** using the **Rainbow Robotics RB-5** robot arm.
- Implemented for a traditional Korean soup restaurant (혼한국밥).

#### 5. Mass Vessel Cleaning Robot

- Designed and delivered a **robotic mass vessel cleaning system** using the **Rainbow Robotics RB-10**.
- Installed in a Korean soup restaurant (혼한국밥) to improve kitchen efficiency and hygiene.

- ■ **Role and Responsibilities:**

- Teaching and programming collaborative robots (Doosan H2017, Rainbow Robotics RB-3, RB-5, RB-10 for mass cooking, soup-making, and robot coffee.
- SICK safety sensors setup and Integration for safety zone configuration.
- Presence sensing to detect workers or objects and prevent collisions.
- Emergency stop activation to ensure safety in critical situations.
- Collaborative robot safety by dynamically adjusting movements based on proximity detection.
- Developing a Robot-PC communication system for seamless data exchange and real-time control.
- Setting up and installing collaborative robots for on-site projects.
- Conducting system integration and performance testing in a Korean restaurant environment to ensure reliability and efficiency in real-world applications.

**R&D Researcher:** January 2024 ~ October 2024

Seochang Tech Co., Ltd, South Korea.

- **Role and Responsibilities:**

- R&D to train a Drone simulator with Hyundai robot using Joystick.
- R&D on Integrated Assembly and Inventory Management Robot.

**Researcher Scholar:** March 2022-Dec 2023

Intelligent Robot Research Lab, (IRRI Lab) South Korea

- **Role and Responsibilities:**

- Research a development on mobile robot based UWB indoor localization system.

**Senior Robotics Engineer:** June 2021 - Feb 2022

Spearsoft Technologies PVT LTD, Hyderabad, India.

- **Role and Responsibilities:**

- Design and development of smart solar-based chairs.

**Robotics Engineer**

Immersive Gamitronics Studio PVT LTD, Hyderabad, India.

- **Role and Responsibilities:**

- Responsible for executing all phases of the commercial product (toys, robots, smart devices, etc) development- understanding the problem, prototyping, evaluation, integration, testing, and monitoring in support of laboratory and field experiments.
- Implementation of theme park gadgets with Kanpur development authority's, Kanpur, India (KDA).

**Robotics Engineer**  
EPR LABs, Chennai, India

■ Research Results:

- Testing an embedded system development for a personal assistance robot “prince”, LCD, LED graphics interfacing, Circuit designing, programming, PCB board designing, sensor interfacing, Conducting training workshop in engineering colleges over a pan India.

**Publications:**

**Book chapters**

- [1] Mosalla,S, **Rahul Ranjan (corresponding author)**, & Singh, S. (2024). A comprehensive exploration of the “Umber” mobile app’s IoT-Infused revolution in umbrella technology. In Advances in computational intelligence and robotics book series (pp. 371–383). <https://doi.org/10.4018/979-8-3693-2373-1.ch018>.

**Journal publications**

- [1] **Ranjan, R.**; Shin, D.; Jung, Y.; Kim, S.; Yun, J.-H.; Kim, C.-H.; Lee, S.; Kye, J. Comparative Analysis of Integrated Filtering Methods Using UWB Localization in Indoor Environment. *Sensors* **2024**, *24*, 1052. [I.F:3.9] <https://doi.org/10.3390/s24041052>.
- [2] Seong, J.; **Ranjan, R.**; Kye, J.; Lee, S.; Lee, S. Enhancing Industrial Communication with Ethernet/Internet Protocol: A Study and Analysis of Real-Time Cooperative Robot Communication and Automation via Transmission Control Protocol/Internet Protocol. *Sensors* **2023**, *23*, 8580. [I.F: 3.9] <https://doi.org/10.3390/s23208580>.
- [3] **Rahul Ranjan.**, S. Lee, and J. Kye. “Design of Tactical Multipurpose All–Terrain Mobile Robot”. *IJMST, SCOPUS* vol. 10, no. 2, Oct. **2023**, pp. 2224-37, doi:10.15379/ijmst.v10i2.2799.
- [4] **Rahul Ranjan**, Humsheer Sandhu, A.Suvarnamma "Design and Development of Wall Climbing Swarm Robot" in Blue Eyes Intelligence Engineering RetrievalNumber:B10240182S219/19©BEIESP & Sciences under International Journal of Engineering and Advanced Technology (*IJEAT*) SCOPUS Indexed Journal ISSN:2249–8958,Volume-8,Issue-2S2,January2019.

**Conference publications**

- [1] **F. A. Rahul Ranjan et al.**, "Improving Indoor Positioning Systems with UWB and Filtering Techniques: A Comparative Analysis," 2023 **23rd, IEEE, International Conference on Control, Automation and Systems (ICCAS)**, Yeosu, Korea, Republic of, **2023**, pp. 1133-1136, doi: 10.23919/ICCAS59377.2023.10316857.
- [2] **Rahul Ranjan**, Shin donggyu, Sophia Mosalla, Sanghyun Kim, Kyung oh Lee, Joongeup Kye. (2023). UWB Sensor Localization based on LPF and KF for Unmanned Vehicle. Proceedings of the National Conference of the Control and Robotics Systems Society, (*ICROS*),82,83, <https://www.dbpia.co.kr/journal/articleDetailnodeId=NODE11480217>.
- [3] **Rahul Ranjan**, J. Kye, K. O. Lee and G. Kang, "Design of a Multipurpose Combat Mobile Robot using Localization Sensor," **2022 22nd, IEEE, International Conference on Control, Automation and Systems (ICCAS)**, Jeju, Korea, Republic of, 2022, pp. 1684-1686, doi: 10.23919/ICCAS55662.2022.10003907.
- [4] S. Bajpai, **Rahul Ranjan**, S. Lee, K. O. Lee and J. Kye, "Development of Ethernet/IP Adapter for Explicit Messaging in Cooperative Robot Communication," **2022 22nd, IEEE, International Conference on Control, Automation and Systems (ICCAS)**, Jeju, Korea, Republic of, **2022**, pp. 103-105, doi: 10.23919/ICCAS55662.2022.10003850.

**Thesis**

- **“A study on Integrated Algorithm using Ultra-Wideband (UWB) for enhancing positioning accuracy of Mobile Robots in Indoor Environment.”** M.S. Thesis, Computer Science and Electronics Engineering, Summon University, February 2024.  
**Supervisor:** Prof. Joong Eup Kye.
- **“Design and development of wall climbing swarm robot.”** B.Tech. Thesis, Department of Electronics and Communication Engineering, SRM University, December 2017.  
**Supervisor:** Dr. S. Krithiga.

### **Industrial Training**

- Undergone 14 days IN-PLANT training at **“BSNL (BHARAT SANCHAR NIGAM LTD”**, India.
- Undergone 14 days IN-PLANT training at **“DOORDARSHAN KENDRA”**, India.
- Undergone 21 days industrial training at **“KANTI BIJLEE UTPADAN NIGAM” W.E.F (NTPC, LTD)**, India.

### **Online Courses**

- **Python developer** course from Udemy.
- AWS training and certification: **Machine Learning Basics.**
- Online Certificate Course in **Machine Learning by National Institute of Electronics & Information Technology (NIELIT) Government of India.**

### **Language proficiency**

- English
- Hindi
- Korean (Level 2)

### **Professional Activities**

#### **Leadership work and Management**

- Participated in K-HUMANOID ROBOT conference organised by Korea Robot Trade Development Council South Korea.
- Participated in South Asia business conference organised by Taiwan External Trade Development Council (TAITRA), Taiwan.
- Conducted one day workshop on **“SIMPLE LINE FOLLOWING ROBOT”** at SRM POLYTECHNIC COLLEGE, Chennai.
- Conducted one day workshop on SIDDARTH-INTERNATIONAL PUBLIC SCHOOL Delhi, India.
- Conducted one-day workshop on S.K MOTHER INTERNATIONAL SCHOOL, Bihar KIDS CARE PUBLIC SCHOOL and Bihar, India.
- Conducted one day workshop at KIDS CARE PUBLIC SCHOOL, Bihar, India.
- Conducted two day’s workshops on **“CANSAT”** at ACS COLLEGE Bengaluru, India.
- Experience in delivering seminars on different and new technology and handling workshop of engineering students as well as school students over pan India.
- Exhibited HIND VEER 1.0 at IIA FAIR 2020,

- Exhibited HIND VEER 1.0 at Telangana State Innovation Cell (TSIC) on independent day.

## Technical Skills

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| <ul style="list-style-type: none"> <li>• Real time robot control and teaching</li> <li>• Robot Simulation and Analysis</li> <li>• Robot-PC Communication</li> </ul> | <ul style="list-style-type: none"> <li>• Electronics and Embedded system</li> <li>• Deep Learning and AI</li> <li>• Robot Teaching Programming</li> </ul> |
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## Simulation Software

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| <ul style="list-style-type: none"> <li>• ROBO DK</li> <li>• PyBullet – LINUX based simulator for Deep Learning</li> </ul> | <ul style="list-style-type: none"> <li>• ROBO GUIDE- Fanuc Robot</li> </ul> |
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## ROBOT Software

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| <ul style="list-style-type: none"> <li>• Rainbow Robot_RB- Rainbow Robot</li> <li>• ROBO Guide- Fanuc</li> </ul> | <ul style="list-style-type: none"> <li>• DART PALTFORM- Doosan ROBOT</li> </ul> |
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## IDE & Frameworks

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| <ul style="list-style-type: none"> <li>• Visual Studio code and Visual Studio IDE</li> <li>• Arduino IDE</li> <li>• Gazebo</li> </ul> | <ul style="list-style-type: none"> <li>• ROS (Robot Operating System)</li> <li>• PyTorch</li> <li>• MoveIt!</li> </ul> |
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## Sensor and Gripper

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| <ul style="list-style-type: none"> <li>• SICK Sensor</li> <li>• LIDAR 360</li> <li>• IR</li> <li>• ON_ROBOT Gripper- 2FG7 an 2FG14</li> </ul> | <ul style="list-style-type: none"> <li>• DHT</li> <li>• GYRO</li> <li>• BMP</li> </ul> |
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## Hardware Development

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| <ul style="list-style-type: none"> <li>• Soldering, Desoldering</li> <li>• Electronics Circuit design and Debugging.</li> <li>• PCB Design (entry level)</li> </ul> | <ul style="list-style-type: none"> <li>• Sensor integration and calibration</li> <li>• Motor control</li> <li>• Robot installation and assembly</li> </ul> |
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## Computer Skills

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| <ul style="list-style-type: none"><li>• Windows</li><li>• LINUX System</li></ul> | <ul style="list-style-type: none"><li>• MacOS</li><li>• Microsoft Office, Hancom office</li></ul> |
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## References

- **Dr. Joongeup Kye, Sun Moon University**  
Professor, Department of Mechanical Engineering, South Korea  
Email: jekye@sunmoon.ac.kr
- **Dr. Ande Murali Varaprasad**  
Ex-DRDO Scientist of RCI, Dr. APJ Abdul Kalam Missile Complex,  
Professor & Director CIGS, India  
Email: amvaraprasad@gmail.com, directorcigs@cigssacet.in
- **R.Ramkumar**  
Dy.Manager, VALF, ISRO(Indian Space Research Organization), Srihari Kota  
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