



Jayprakash S. Nair (JP)

Roll No.:24A02RES06

Master Of Technology

Artificial Intelligence & Data Science

Indian Institute Of Technology Patna

+91-8011223141

jsnair.hi@gmail.com

jayprakash_24a02res06@iitp.ac.in

Github | Website

linkedin.com/in/jayprakash-nair-8a937a18a

SUMMARY

Aspiring to be a researcher in Multi-Agent Multi-Robot Systems. My current research focuses on **Autonomous Systems**, **Federated Learning** and **Swarm Learning**, and intelligent agent coordination. I have co-authored two papers on decentralized learning strategies in multi-robot environments using **mobile agents**. With a passion for advancing **multi-agent systems**, I aim to contribute to innovative life-long learning solutions in the realm of robotics.

EDUCATION (IN ENGLISH MEDIUM THROUGHOUT)

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
M.Tech. (AI & DS)	Indian Institute of Technology, Patna	9.0 (Current)	2024-Present
B.Tech. (CSE)	APJ Abdul Kalam Technological University, Kerala	7.05	2018-2022
Senior Secondary	CBSE Board (Physics, Comp.Sc., Maths., Chem. & English)	76.2%	2018

EXPERIENCE

- People10 Technologies Inc.** July 2022 - Aug. 2024
Software Engineer Bengaluru, India
 - Developed e-commerce features for Allegiant Air (GraphQL, pricing, bundles, bookings)
 - Implemented QA automation scripts
- Indian Institute of Technology (IIT) Guwahati** Feb. 2019 - Dec. 2019
Research Intern Guwahati, India
 - Learnt to control robots within Webots using Python
 - Program mobile agents using *Tartarus*, a multi-mobile agent platform

PROJECTS

- Allegiant Air Navitaire Initiative** Jul. 2022 - Jul. 2024
People10 Technologies Live Url
 - Contributed to UI enhancement, GraphQL mutation development, shopping cart pricing updates, and QA process automation for the Allegiant Air project under the Navitaire Initiative
 - **Tools & technologies used:** PHP, Symfony, GraphQL and JavaScript
- On Decentralizing Federated Reinforcement Learning in Multi-Robot Scenarios** Dec. 2021 - Jan. 2022
Bachelor's Project
 - Realized Decentralized Federated RL (Q- & SARSA) for robots running on multiple instantiations of Webots running on different PCs connected via the LAN, using mobile agents
 - **Tools & technologies used:** *Tartarus*, Python and Webots
- RL for e-puck within Webots** Feb. 2019 - Dec. 2019
IIT Guwahati Github
 - Developed and evaluated RL (Q- and SARSA) robot controllers in Webots
 - **Tools & technologies used:** Python and Webots

KEY COURSES TAKEN

- Data Structures, Algorithms, DBMS, Machine Learning, Artificial Intelligence, Web Services, Operating Systems, Deep Learning

TECHNICAL SKILLS

- **Programming:** C/C++, Python, R, JavaScript, SQL
- **Tools & OS:** Git, Jupyter Notebook, Google Colab, Webots, LaTeX, Linux, Windows
- **Libraries/Frameworks:** Pandas, Numpy, scikit-learn, PyTorch, Symfony
- **Web Skills:** HTML/CSS/JS, ReactJS, PHP, GraphQL

LANGUAGES

- English, Hindi, Malayalam

PUBLICATIONS

- **On Decentralizing Federated Reinforcement Learning in Multi-Robot Scenarios**

2022

Authors: *Jayprakash S. Nair, Divya D. Kulkarni, Ajitem Joshi, and Sruthy Suresh.*

- *7th South-East Europe Design Automation, Computer Engineering, Computer Networks and Social Media Conference (SEEDA-CECNSM).*
- DOI: 10.1109/SEEDA-CECNSM57760.2022.9932985 | [Click here for a copy](#)

Abstract:

This paper presents a mobile agent-based approach to Decentralized Federated Learning (FL) in multi-robot systems, addressing challenges like central node failure and bandwidth bottlenecks. Using Webots, an open-source robot simulator, and Tartarus, a mobile agent platform, we demonstrate how mobile agents enable Decentralized Federated Reinforcement Learning (dFRL). Experiments with Q-learning and SARSA show the viability of aggregating Q-tables across connected robots without central control. The proposed framework is adaptable to other learning algorithms and real robots, offering a versatile tool for studying decentralized FL in heterogeneous multi-robot systems.

- **A Hybrid Federated Reinforcement Learning Approach for Networked Robots**

2023

Authors: *Gayathri Rangu, Divya D. Kulkarni, Jayprakash S. Nair, and S. B. Nair*

- *Recent Advances in Electrical and Electronic Engineering.* Springer Nature Singapore.
- DOI: 10.1007/978-981-99-4713-3_47 | [Click here for a copy](#)

Abstract:

Federated Learning (FL) ensures data privacy by aggregating local models instead of raw data at a central server. However, centralized FL risks failures due to server or network issues, while decentralized FL avoids this but increases learning time. This paper introduces Hybrid Federated Reinforcement Learning (HyFRL), a mobile agent-based approach combining centralized and decentralized methods for networked robotics. Using Webots, an open-source robot simulator, multi-robot experiments demonstrate HyFRL's effectiveness in aggregating and sharing Q-tables across connected robots, outperforming both centralized and decentralized FL approaches.

REFERENCES

- **Prof. Pradip K. Das**

Indian Institute of Technology Guwahati

Professor – Dept. of Computer Sci. & Engg.

- **Email:** pkdas@iitg.ac.in
- **Phone:** +91-361-2582353
- **Relation:** Internship Supervisor and Mentor

- **Dr. Siyamol Chirakkarottu**

Federal Institute of Science And Technology

Asst. Professor (Special Grade) - Dept. of Computer Sci. & Engg.

- **Email:** siyaanil@fisat.ac.in
 - **Phone:** +91-484-2725029
 - **Relation:** Teacher and Group Advisor
-