Divya D Kulkarni

divyadk@iitg.ac.in, d.divyakulkarni@gmail.com
http://www.iitg.ac.in/stud/divyadk/
https://scholar.google.com/citations?user=eS30bgkAAAAJ&hl=en
https://www.linkedin.com/in/divyadk/
https://github.com/divyadk
+918762070054

Education

2016 – 2023 **Ph.D., Computer Science nad Engineering, Indian Institute of Technology (IIT) Guwahati, India**
Thesis title: *Immuno-Inspired Embodied Lifelong Learning in Robots.*

2010 – 2014 **Bachelors of Engineering, Computer Science and Engineering, SDMCET, Dharwad, India**
CGPA: *8.82*.

Research

- My research mainly involves Bio-Inspired Machine Learning, where nature-inspired techniques like evolutionary algorithms and artificial immune systems are applied to solve the problems. Published works involve neuroevolutionary paradigms to evolve robot controllers online and onboard the robot. My Experimental studies involve not just simulation but robots in the real world. I also work on transfer learning in deep neural networks and how Bio-Inspired strategies can aid in the transfer of deep models. My focus is currently on computer vision problems, mainly segmentation based models.

Research Publications

Conferences

1. **Kulkarni**, **D. D.** & Nair, S. B. (2023). Transfer learning for embodied neuroevolution **(Accepted for publication)**. *Neuroevolution at Work Workshop, Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO)*.
2. Bagchi, M. J., **Kulkarni**, **D. D.**, Nair, S. B. & Das, P. K. (2022). On embedding a dataflow architecture in a multi-robot system, 271–276.
3. Nair, J. S., **Kulkarni**, **D. D.**, Joshi, A. & Suresh, S. (2022). On decentralizing federated reinforcement learning in multi-robot scenarios, 1–8.
4. **Kulkarni**, **D. D.** & Nair, S. B. (2021). An immuno-inspired transfer learning paradigm. *IEEE Congress on Evolutionary Computation (CEC)* ***(Winner - Best Student Paper Award)***.
5. Agrawal, A., **Kulkarni**, **D. D.**, Semwal, T. & Nair, S. B. (2020). On decentralizing federated learning. *IEEE Conference on Systems, Man and Cybernetics (SMC)*.
6. **Kulkarni**, **D. D.** & Nair, S. B. (2020). Mutational puissance assisted neuroevolution. *Neuroevolution at Work Workshop, Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO)*, 1841–1848. https://doi.org/10.1145/3377929.3398149
7. Ishita, I., **Kulkarni**, **D. D.**, Semwal, T. & Nair, S. B. (2019). On securing mobile agents using blockchain technology. *Second International Conference on Advanced Computational and Communication Paradigms (ICACCP)*.

8 **Kulkarni, D. D.**, Semwal, T. & Nair, S. B. (2019). Agrilogistics - a genetic programming based approach. *SC4Life 2019 - EAI International Conference on Society with Future: Smart and Liveable Cities, Braga, Portugal*.

9 Semwal, T., **Kulkarni, D. D.** & Nair, S. B. (2018). On an immuno-inspired distributed, embodied action-evolution cum selection algorithm. *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO), Kyoto, Japan*, 141–148.

Journals

1 Kulkarni, D. D., Semwal, T. & Nair, S. B. (2022). Immuno-inspired management of halls of fame for embodied evolution. `https://doi.org/https://doi.org/10.1016/j.swevo.2022.101054`

Industry Experience

Oct 2022 - Present
- **Machine Learning Consultant - Eli Lilly and Company** Focusing on Computer Vision and Deep Learning in the Advance Analytics and Data Science vertical of the company

Feb 2022 - Sep 2022
- **Machine Learning Scientist Intern - Eli Lilly and Company** Worked as an intern in the Advance Analytics and Data Science focusing on Computer Vision and Deep Learning

2014 – 2015
- **Member Technical Staff (Software Development) - MetricStream India Pvt. Limited**
  Customization of the GRC and related products according to the customer requirements and building new customer specific modules.

Skills

Coding
- Python, C++, Prolog, C ; *Software Libraries:* Pytorch; *Robotics Middleware:* ROS

Robot Simulator
- Webots

Hardware
- Firebird V (ATMEGA2560) Robot, LEGO Mindstorms Robot, Raspberry Pi and Arduino and Various sensors

Awards and Achievements

2022
- **Google Research (India) Symposium** One of the PhD students selected in the Asia-Pacific region

2021
- **Winner - Best Student Paper**, *An Immuno-Inspired Transfer Learning Paradigm*, IEEE Congress on Evolutionary Computation (CEC), Kraków, Poland (28 June - 1 July 2021)
- **Session Chair**, Selected to chair the session "Evolved Neural Networks - II" at the IEEE Conference on Congress on Evolutionary Computation (CEC), Kraków, Poland (28 June - 1 July 2021)
- **Participation Grant**, Conference: IEEE Congress on Evolutionary Computation (CEC) - Registration Fee Waiver
- **Google Research (India) Symposium** One of the PhD students selected in the Asia-Pacific region

2018
- **Travel Grant US$700**, Conference: Genetic and Evolutionary Computation Conference (GECCO), Kyoto, Japan

Other Experiences

Teaching Assistantship

2018-Present
- Head TA - Mobile Robotics
  Guiding the students on various Robotic course projects. Preparation of Course Assignments and Projects. Supervised 2 other TAs

2017-2019
- Head TA - Computer Peripherals and Interfacing Lab
  Guided students on various IoT based projects , prepared course material, supervised 8 other TAs

2016-2017
- TA - Operating Systems, Introduction to Computing and Computer Peripherals and Interfacing Lab

Mentoring
- Have mentored an undergrad student and five masters students on their theses.

Certification

2020
- **Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization** Platform: Coursera

2017
- **Neural Networks and Deep Learning**. Platform: Coursera

Voluteering

2020
- Volunteered at Thirty-seventh International Conference on Machine Learning (ICML) (Virtual)
- Volunteered at Thirty-fourth Conference on Neural Information Processing Systems (NeurIPS) (Virtual)

2018
- Volunteered at Genetic and Evolutionary Computation Conference (GECCO) 2018, Kyoto, Japan

Open Source Projects

2017-Present
- Full Stack developer - Tartarus
  Tartarus (`https://github.com/roboticslab-cseiitg/ProjectTartarus`) is an open source multi-mobile agent platform in SWI-Prolog, developed in-house at Robotics Lab., IIT Guwahati. Involved in adding new features and maintaining this platform

2020-Present
- Full Stack Developer - TarPy
  TarPy is an open source multi-mobile agent platform in Python, being developed in-house at Robotics Lab., IIT Guwahati. Involved in conceptualizing and developing this tool, which is yet to be released as an open source tool (Release date : Early 2023)