







# Pankayaraj . P - BSc Computer Engineering

✉ p.pankayaraj@gmail.com




🌐 <http://pankayaraj.github.io>

🌐 <https://www.linkedin.com/in/pankayaraj-pathmanathan-259926119/>

## Employment History

- 2023-Current - 7 months  **Research Assistant** Advisor: Prof. Furong Huang.  
Department of Computer Science, University of Maryland, USA  
- Worked on diverse reinforcement learning  
- Work under review at ICLR 2024
- 2022-Current  **Teaching Assistant (CMSC320 (Fall 2022):** Introduction to Data Science. Instructor: Prof. Maksym Morawski), **(CMSC742 (Fall 2023):** Algorithms in Machine Learning: Guarantees and Analyses. Instructor: Prof Furong Huang)  
Department of Computer Science, University of Maryland, USA
- 2022-2022 - 7 months  **Research Engineer** Supervisor: Prof Pradeep Varakantham  
Singapore Management University (SMU)  
- Worked on Constraint Reinforcement Learning in Hierarchical Settings  
- Work was published on AAAI 2023.
- 2020-2021 - 14 months  **Collaborator** Flowers Laboratory, ENSTA Paris.  
- Working on the ways to improve continual offline reinforcement learning with artificial curiosity  
- Work was published on Cognitive Computational Journal 2023
- 2020-2021 - 12 months  **Research Assistant** SLTC, QBITS Lab.  
- Working on task specialization in the context of multi agent multi goal reinforcement learning
- 2019-2019 - 5 months  **Research Assistant Intern** SLTC, QBITS Lab.  
- Worked on devising communication strategies for multi agent multi arm bandit problems in both normal and delayed reward settings.  
- Works were published on IEEE CDC 2020 and ECC 2020 respectively.

## Education

- 2022-2027  **PhD Computer Science**, Department of Computer Science, University of Maryland, USA. **GPA:** 3.8 out of 4.0  
**ADVISOR: Prof Furong Huang**
- 2015-2020  **B.Sc. Computer Engineering** University of Peradeniya, Sri Lanka **GPA:** 3.5 out of 4.0
- English Proficiency  **TOFEL: 112**, Reading: **29**, Listening: **30**, Writing: **26**, Speaking: **27**

## Research Publications

## Conference Proceedings

- 1 **Pankayaraj P**, Rodríguez, N. D., & Ser, J. D. (2023). Using curiosity for an even representation of tasks in continual offline reinforcement learning, In *Cognitive Computation Journal* 2023 **Impact Factor : 5.4**.
- 2 **Pankayaraj P**, & Varakantham, P. (2022). Constrained reinforcement learning in hard exploration problems [Poster ], In *37th AAAI Conference on Artificial Intelligence Washington, D.C. USA* **Acceptance rate : 19.6 %**.
- 3 **Pankayaraj. P**, & Maithripala, D. H. S. (2020). A decentralized communication policy for multi agent multi armed bandit problems [Presented ], In *European Control Conference 2020, Saint Petersburg, Russia* **Acceptance rate : 58%**.
- 4 **Pankayaraj P**, Maithripala, D. H. S., & Berg, J. M. (2020). A decentralized policy with logarithmic regret for a class of multi-agent multi-armed bandit problems with option unavailability constraints and stochastic communication protocols [Presented ], In *59th IEEE Conference on Decision and Control, Jeju Island, Republic of Korea* **Acceptance rate : 52.7%**.
- 5 Jayatilaka, G., Weligampola, H., Sritharan, S., **Pankayaraj Pathmanathan**, Ragel, R., & ], I. N. [ (2019). Non-contact infant sleep apnea detection [Presented], In *ICIIS 2019 Sri Lanka*.

## Under Review

- 1 **Pankayaraj P**, & Huang, F. (2023). *SDM-RL: Steady-State Divergence Maximization for Robust Reinforcement Learning Under Review*, in the *12th International Conference of Learning Representations (ICLR 2024)*.

## Symposiums


- 1 **Pankayaraj P**, Sumanasekera, Y., Samarasinghe, C., Elkaduwe, D., Jayasinghe, U., & Maithripala, D. H. S. (2020). *Multi-agent reinforcement learning in sparsely connected cooperative environments*[ **Presented, awarded the Best Research Paper**], in *ESCaPe 2020, Sri Lanka*.

## Preprints

- 1 **Pankayaraj P**, Sumanasekera, Y., & Samarasinghe, C. (2019). *A review on reinforcement learning based autonomous quadcopter control*.


## Academic Volunteering

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- 2020  **Peer Reviewer : Journal** IEEE Transactions on Communications  
- Impact Factor : 5.69 (2018)

## Projects

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- 2023  **Efficient Exploration in Reinforcement Learning** Improving the sample efficiency in RL where entropy of occupancy measure is used as an exploration mechanism  
Report <https://drive.google.com/file/d/1ESQZunSYI8WegsgiQ63HJmHgUXHIF1LU/view?usp=sharing>

## Projects (continued)



- 2019 **Virtual Maze Navigation Using Different Locomotion Techniques** Analysing the effects of Redirected Walking and Steering in VR environments and proposing a hybrid locomotion technique.  
Report <https://drive.google.com/file/d/11JiiJo0ZzJLbtfumzjThmq3Yp0BEG1pF/view?usp=sharing>
- 2019 **Reinforcement Learning Based Autonomous Quadcopter Control**  
Using Reinforcement Learning algorithms to make Quadcopter control decisions on an AirSim simulated environment  
  
REPORT: <https://drive.google.com/drive/folders/16Ej8XL4SRrtHL58FsMMnYDaD5WYWruF9>
- 2018 **A user recommendation method using Bayesian Reinforcement Learning**  
Github Link : <https://github.com/pankayaraj/sitnshop/tree/BackEndAlgorithm>  
REPORT : <https://drive.google.com/drive/folders/19Sq1UExeANUWQGGVf8EXBCrPRntAFvaF>
- 2017 **Creating a python based library with a Tensor flow back end for Bayesian Optimization and Multi Arm Bandit Problem**  
GitHub Link : <https://github.com/pankayaraj/Multi-Arm-Bandit-Library>  
PyPi link : <https://pypi.python.org/pypi/mabandit/1.3>  
REPORT: <https://drive.google.com/drive/folders/1H2Pcbfj825LPbYjo3rnKLY0lgRQCfWxb>
- 2018 **SitnShop– An Advertising platform for shops** An advertising platform for anykind of shop and it also helps the customers of the shops to easily find related shops.  
Github Link : <https://github.com/pankayaraj/sitnshop/>  
REPORT : <https://drive.google.com/drive/folders/1ZcsJkFPDCJhvh8k0yt0LjnxBkJ1cAgaB>
- Infant Sleep Apnea detection system : A portable device that can detect Sleep Apnea condition in infants using techniques such as Optical flow, Edge detection, Fourier analysis with python, Raspberry pi.**  
Github Link : [https://github.com/pankayaraj/Sleep\\_Apnea\\_Detection](https://github.com/pankayaraj/Sleep_Apnea_Detection)  
REPORT: [https://drive.google.com/drive/folders/17fLXhj1uxl5MuqNqEM46\\_tYuRsWoXC2Z](https://drive.google.com/drive/folders/17fLXhj1uxl5MuqNqEM46_tYuRsWoXC2Z)
- Making a central server for the sleep apnea problem**  
Technologies : Python, Django, Django rest framework, HTML/CSS,JS  
Github Link: [https://github.com/pankayaraj/Django\\_Server\\_Sleep\\_Apnea](https://github.com/pankayaraj/Django_Server_Sleep_Apnea)
- 2017 **ExpertMiner :**  
**Earth resource location prediction using Hyper Spectral Images from satellites** Techniques : Pattern Recognition, Correlation Mapping  
Github Link : [https://github.com/pankayaraj/HSI\\_Project](https://github.com/pankayaraj/HSI_Project)

## Skills

- Languages **English (TOFEL: 112, Reading: 29, Listening: 30, Writing: 26, Speaking: 27), Tamil(Native).**
- Coding **Python , Java ,  $\LaTeX$ , C++, C, Matlab**
- Libraries **Tensorflow, Pytorch, Kivy, Numpy, Scipy**
- Web Dev **Dijango**

## Skills (continued)




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- Interested Fields     Reinforcement Learning, Deep Learning, Machine Learning, Statistics and Probability, Bayesian Models, Numerical Computation, Algorithmic Problem Solving, Web and GUI development
- Misc.     Academic research

## Miscellaneous Experience

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### Awards and Achievements

- 2017     **ACES Hackathon 2017(Intra university hackathon)** : Project:Expert miner: Software section winners, Best idea of the competition
- 2016     **ACES Coders v6.0** (Inter university programming competition):Country Rank : 4th
-  **IEEEExtreme 10.0 Programming competition**(24 hour Global Programming competition  
Country Rank: 38th  
World Rank: 330th

## References

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### **Prof Furong Huang**

Assistant Professor  
Department of Computer Science, University of Maryland,  
USA.  
furongh@umd.edu

### **Prof Pradeep Varakantham**

Professor of Computer Science  
School of Computing and Information Systems, Singapore Management University,  
Singapore.  
pradeepv@smu.edu.sg

### **Dr D.H.S Maithripala**

Senior Lecturer  
University of Peradeniya,  
Peradeniya, Sri Lanka.  
smaithri@pdn.ac.lk  
mugalan@gmail.com