Unnikrishnan Rajendran Menon

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Education

B.Tech in Electrical and Electronics Engineering 07/2017 – 06/2021
Vellore Institute of Technology, Vellore - India
CGPA: 8.63/10

Class 12 Board Examination (CBSE): 94.2% 2017
Summer Fields School, New Delhi

Class 10 Board Examination (CBSE): 10 CGPA 2015
Summer Fields School, New Delhi

Technical Skills

- **Microcontrollers** – Arduino, Raspberry Pi, 8051 Assembler, Nexys4 DDR Artix-7 FPGA, NVIDIA Jetson Nano
- **Programming Languages** – Python, C/C++, C#, Javascript, Java, Assembly, Verilog, CUDA
- **Mathematical Packages** – MATLAB, R
- **Typesetting Software** – LaTeX
- **Other** – Unity3D, TensorFlow, Keras, PyTorch OpenAI Gym, SocketIO, Qiskit

Publications

1. Unnikrishnan Menon, Anirudh Rajiv Menon, Atharva Hudlikar, A. Sharmila, and P. Mahalakshmi. A hybrid autoencoder architecture for text encryption. In *2021 Innovations in Power and Advanced Computing Technologies (i-PACT)*, pages 1–7, 2021
2. Awnon Bhowmik and Unnikrishnan Menon. An adaptive cryptosystem on a finite field. *PeerJ Computer Science*, 7:e637, 2021
3. Unnikrishnan Menon and Anirudh Menon. An efficient application of neuroevolution for competitive multiagent learning. *Transactions on Machine Learning and Artificial Intelligence*, 9(3):1–13, May 2021
4. Unnikrishnan Menon, Anirudh Rajiv Menon, and Atharva Hudlikar. A novel chaotic system for text encryption optimized with genetic algorithm. *International Journal of Advanced Computer Science and Applications*, 11(10), 2020
5. Unnikrishnan Menon and Divyani Panda. Design and evaluation of electric bus systems for metropolitan cities. *SSRG International Journal of Mechanical Engineering*, 7(10):16–23, Oct 2020
6. Unnikrishnan Menon, Atharva Hudlikar, and Divyani Panda. Scytale - an evolutionary cryptosystem. *International Journal of Computer Science and Network*, 9(4):153–159, Aug 2020
7. Awnon Bhowmik and Unnikrishnan Menon. Mes – modern encryption standard. *International Journal of Computer Applications*, 176(36):21–27, Jul 2020
8. Awnon Bhowmik and Unnikrishnan Menon. Dragon crypto – an innovative cryptosystem. *International Journal of Computer Applications*, 176(29):37–41, Jun 2020
9. Awnon Bhowmik and Unnikrishnan Menon. Enhancing the ntru cryptosystem. *International Journal of Computer Applications*, 176(29):46–53, Jun 2020

Work Experience

Machine Learning Engineer *(Full-Time)* 08/2021 – Present
Raven Protocol Pte Ltd., Singapore

- Working on Raven Protocol's Distributed Deep Learning tool that provides essential abstractions for training complex Deep Learning architectures in the Ravenverse.
- Developed a Python SDK that allows Contributors to intuitively participate in any ongoing MLOPs graph computations in the Ravenverse and get Raven Token rewards in return.
- Implemented an advanced scheduling algorithm that breaks down a Developer's ML model into concurrently computable Operations, and emits them to Contributors across the world based on their available compute power. This paradigm facilitates faster and cheaper training of deep learning models.
- Built a secure and scalable industry-standard Federated Learning Framework from scratch. Added a layer of Homomorphic Encryption for data privacy.

Machine Learning Intern 05/2021 – 08/2021
Raven Protocol Pte Ltd., Singapore

- Implemented and documented a collection of ML algorithms like Regression Models, KNN, SVMs, K-Means, Perceptron and Decision Trees using Raven Distribution Framework.

AI Developer Intern 12/2019 – 05/2020
MellonAI, Chennai, India

- Worked on multiple CV projects including head pose estimation, deep facial recognition, and emotion detection.

Extracurricular

Technical Lead of Electrical Department 02/2019 – 02/2020
RoboVITics, the official robotics club of VIT

- Led an engineering team of enthusiasts to the successful completion of several projects involving Control Systems, Robotics, Electronics, Mechanical Designing, Artificial Intelligence, IoT, and other technologies.
- Conducted Workshops and taught students about everything they need to know for starting a career in robotics and assisted them in building their own robots.

Motor Driver Circuit Designer 07/2018 – 01/2020
Team Orcus

- Designed a 120 lbs combat robot that Finished in top 7 internationally at RoboWars, TechFest'18, IIT Bombay
- Secured 3^{rd} position in RoboWars, Kurukshetra'19, Anna University

Core-Committee Member 12/2017 – 02/2019
RoboVITics, the official robotics club of VIT

- Successfully completed multiple robotics projects involving Machine Learning, Computer Vision, Artificial Intelligence, IoT etc.

Achievements

Top 15 Finalist in MakeMIT 2021 03/2021

- *Worked on the hardware and motion-planning algorithm for a creative and compact wall painting robot that harnesses the power of vacuum and IoT to help make your walls beautiful.*

Winner of Urban Innovation Track at HackMIT 2020 09/2020

- *Deployed a Reinforcement Learning based solution for project Navscape that helps with navigation within buildings and indoor environments where GPS is unavailable.*

Winner of HackerTech 2019 12/2019

- *Secured First Position in this 24 hr long Hackathon where I worked on project SPARC (Smart Power Allocation using Reinforced Clusters).*

Winner of VIT Hack 2019 09/2019

- *Won VITHack organized by VIT University in collaboration with Honeywell*

Special Mention Prize in Access Denied Hackathon 2019 03/2019

- *Got Special Mention prize in Logistics and Transportation from GitHub.*

Winner of Developer's Sprint of Code Hackathon by CodeChef 02/2019

- *Secured the First Position in this 36 hour Hackathon. I worked on the hardware and a facial emotion recognizer for a Comprehensive Electoral Solution Suite.*

Quora Top Writer 2018 01/2018

- *Got the coveted Top Writer's Quill on my Quora profile for writing quality technical content. Got New York Time's subscription and a t-shirt as a reward from Quora*

Made 6 NEO Observations (International Astronomical Search Collaboration) 2016

- *Used Image-Stacking technique with Astrometrica software to detect potential asteroids from data collected by the Campus Observatory at University of Illinois. Ended up spotting 6 Near Earth Objects.*

Projects

View all Project Demonstrations on my **Portfolio Website**

Rummy AI 08/2021 – 11/2021

- This AI deploys a Federated Learning Architecture built from scratch with SocketIO to train a Reinforcement Learning agent based on Proximal Policy Optimization (PPO) that can learn to take risks and play the classic Gin Rummy card game.

AI Agents for Video Games 10/2018 – Present

- Agent that learns to play Ball Blast Game using DDPG algorithm.
- Nokia Snakes Game using Deep Q-Networks.
- SuperMario Bros speedrun with Neuro-Evolution.
- Cooperative multi-agent Pong game environment that uses NEAT Genetic Algorithm.

- PacMan AI: A better way to train RL models by incorporating autoencoders to reduce the dimensionality of the environment frames.
- AI for obtaining multiple solutions to the Puzzle-8 game.
- Self-Learning Chrome Dino Game with genetic algorithm.

Cypher – VR Surveillance Robot *(Capstone Project)* 02/2021 – 05/2021
Advisor: Dr. P. Mahalakshmi

- Designed and implemented a remote surveillance robot which can be deployed for search operations in alien environments. Integrated a gaming controller and Virtual Reality interface for control and vision. Thesis

Navscape – An Indoor Navigation Paradigm 09/2020 – 10/2020

- NavScape is an ingenious Reinforcement Learning based algorithm that uses CCTV footage data in conjunction with existing methodologies to prepare public institutions to sustain in a post-covid world.

Self learning Quadruped 03/2020 – 04/2020

- Augmented Random Search Algorithm based AI that teaches a robotic quadruped to walk.

Sudoku Vision 01/2020 – 02/2020

- An application that can detect sudoku puzzles placed in front of a camera and solves them in real time automatically.

Path Prediction for Smart Vehicles 09/2019 – 10/2019

- A Path Prediction Algorithm which forecasts future path taken using RNN−LSTMs and on top of that optimizes the predicted trajectory using Deep Q-Learning Algorithm.

Rap lyrics generator using LSTMs 02/2019 – 03/2019

- LSTM model that imitates the style of a given rapper and generates rap lyrics based on a seed user input.

Self Learning Crawler Robot 12/2018 – 02/2019

- This robot uses the Deep Q Networks algorithm to choose the best strategy for manipulating a robotic arm to crawl on any surface and move forward, regardless of its orientation.

Prepaid Energy Credits based Power Distribution System 01/2019 – 02/2019

- Machine learning based algorithm for predicting power usage in a common household. Later integrated to work with an Raspberry Pi based smart energy meter.

Autonomous Rubik's Cube Solver 02/2018 – 04/2018

- Developed an algorithm in under 800 lines of C++ code that predicts the correct moves to solve a scrambled $3 \times 3 \times 3$ Rubik's Cube.

References

Dr. P. Mahalakshmi, Professor
Department of Instrumentation
School of Electrical Engineering (SELECT)
Vellore Institute of Technology, Vellore - 632014, India
Email: pmahalakshmi@vit.ac.in

Dr. Rashmi Ranjan Das, Associate Professor
Department of Control and Automation
School of Electrical Engineering (SELECT)
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Dr. Razia Sultana W, Associate Professor
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Mr. Awnon Bhowmik, Graduate Teaching Assistant
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