

ASHWIN M DEVANGA

MS in Data Analytics Engineering, Northeastern University, Boston MA

B.Tech in Biotechnology, IIT Guwahati, India.

Email-id : devanga.a@northeastern.edu / ashwinmdevanga@alumni.iitg.ac.in

Mobile No.: +1 (857)-269-6777 / +91 97415 24775

Linkedin: <https://www.linkedin.com/in/ashwin-devanga>

Website : <https://www.ashwindevanga.com/>

Github: <https://github.com/ashwin-M-D>

INTERESTS

- Reinforcement Learning, Machine Learning and Data Mining.
- Industrial Simulation and Digital Twin
- Linux userspace optimisation and Virtual Machines

EDUCATION

Examination	University	Institute	Year	Grades
Graduate Specialization: Graduation(M.S)	<i>Data Analytics Engineering</i> Northeastern University	Northeastern University, Boston	2022	3.72/4
UnderGraduate Specialization: UnderGraduation(B.Tech)	<i>Biotechnology</i> IIT Guwahati	IIT Guwahati, Guwahati	2020	6.01/10
12th Grade Specialization:	<i>Maths and Science</i> Telangana State Board	Vijay Ratna Junior College	2016	94.8%
10th Grade	ICSE	Presidency School, R.T Nagar, Bangalore	2014	95.33%

TECHNICAL SKILLS

- **Languages** (Python, R, MATLAB, JAVA, C, C#, Visual Basic)
- **Databases** (SQL, Neo4j, MongoDB)
- **Scripting** (Linux shell [bash, zsh], Windows[BATCH])
- **Tools** (GIT, Make, CMake, Tableau, Simio, AMPL, \LaTeX , Arduino, Raspberry Pi, VMD, PyMol, NAMD)
- **Operating Systems** (Windows, Linux [Deb, rpm, arch])
- **Web Technologies** (HTML, PHP, CSS, TypeScript, Markdown)

EXPERIENCE

- **Masters Thesis Project** (MIE-COE, Northeastern University)
(Guide: Dr. Dehghanimohammadabadi Mohammad, MIE-COE, Northeastern University, June'21 - Current)
 - DM-Gym: Data Mining Gym Environment for Reinforcement Learning
 - Environment used: Python
- **Teaching Assistant** (MIE-COE, Northeastern University)
(Guide: Dr. Dehghanimohammadabadi Mohammad, MIE-COE, Northeastern University, Jan'21 - Current)
 - Course IE7374: Reinforcement Learning: Spring 2021, Summer 2021, Fall 2021, Spring 2022
 - Course OR6500: Meta-heuristics and Applications: Summer-1 2021, Fall 2021, Spring 2022
 - Course IE7215: Simulation Analysis: Summer-2 2021, Fall 2021, Spring 2022
- **Research Assistant** (MIE-COE, Northeastern University)
(Guide: Dr. Dehghanimohammadabadi Mohammad, MIE-COE, Northeastern University, Jan'21 - Current)
 - Reinforcement Learning and Meta-Heuristics for Operations Research Problems.
 - Worked on Operations Research problems such as the Vehicle Routing Problem and Job Scheduling.
 - Environment and Tools used: MATLAB, Python, C#, Simio

- **Bachelor Thesis Project** (Computational Structural Biology Lab)
(Guide: Dr. P Satpati, BSBE Dept, IIT Guwahati, April'19 - May'20)
 - Build and analyze computer simulations on the affects of salt concentrations on the peptide, Human β -Defensins.
 - Analyze data from the simulations run on NAMD/Gromacs would lead us to the reason as to why humans are immuno-compromised when they are affected by cystic fibrosis.
- **Research Internship** (Chubu University, Japan)
(Guide: Prof. K. Yamauchi, May'19 - July'19)
 - Development of a modified Actor - Critic algorithm with dual actors to improve performance.
 - Usage of DNNs for feature extraction and combining it with Actor-critic one shot Learning.
 - Environment Used: Python with PyTorch and JAVA.
- **Research Internship** (Chubu University, Japan)
(Guide: Prof. K. Yamauchi, May'18 - July'18)
 - Project based on Machine learning on a budget. Implementation of Supervised Reinforcement learning using Actor-Critic model for one-step learning.
 - Development of a modified bagging system.
 - Environment Used: Java
- **Industrial Experience** (Kamtress Automation Systems , Bangalore)
(May'17 - June'17) <http://www.kamtress.in/>
 - PLC programming, and Mechanical construction of automated electrolysis machinery.

MAJOR PROJECTS

- **DM-Gym: A set of environments for developing reinforcement learning agents to solve Data Mining problems** (Research Project)
(Guide: Dr. Dehghanimohammadabadi Mohammad, MIE-COE, Northeastern University, Aug'21 - Current)
 - Masters Thesis Project. Presented at Informs Annual meet 2021, Anaheim, Los Angeles, CA
 - GitHub Link: <https://github.com/ashwin-M-D/DM-Gym>
 - PyPI Link: <https://pypi.org/project/dm-gym/>
- **Job Scheduling and Vehicle Routing Problem using Reinforcement Learning** (Research Project)
(Guide: Dr. Dehghanimohammadabadi Mohammad, MIE-COE, Northeastern University, Jan'21 - May'22)
 - Use Reinforcement Learning to optimize Job scheduling and solve the Vehicle Routing Problem.
 - Compare RL methods with meta-heuristic methods to solve the same problem
 - Used Tabular and DQN based RL
 - Used Genetic Algorithm and Particle Swarm Optimisation based meta-heuristic approaches
 - Environment used: Python, C#
 - Tools used: Simio
- **Human computer collaborated learning through Reinforcement Learning.** (Research Project)
(Guide: Prof. K. Yamauchi, May'18 - Dec'18)
 - The system forms a collaboration with human and reinforcement learning neural network and also generates a platform for data sharing between systems to develop a super neural network.
 - Research paper published in ICPRAM 2019.
- **Automated Toilet Cleaner** (Inter IIT Tech meet 2017-18, IIT Madras)
(Technical Board, IIT Guwahati, Oct'17 - Jan'18)
 - Built a robot which can pick up trash on the floor, clean the floor and commode clear of stains without manual control, Using Arduinos and Raspberry Pi for computations and data processing in real time.
 - Worked on construction and control of robotic arm. Used Kernelized Correlation Filters (KCF) tracking algorithm for tracking the object and Histogram of Oriented Gradients (HOG) with a Support Vector Machine (SVM) to identify the commode. Used Otsu Thresholding to detect stains on the floor.
 - In total a collection of 12 motors, 2 cameras, 6 sensors, an Arduino, a Raspberry Pi and a laptop were synchronizing and processing data in real time.

PUBLICATIONS

- Devanga, A. and Yamauchi, K. (2019). **Collaborative Learning of Human and Computer: Supervised Actor-Critic based Collaboration Scheme**. In *Proceedings of the 8th International Conference on Pattern Recognition Applications and Methods - Volume 1: ICPRAM*, ISBN 978-989-758-351-3, pages 794-801.
DOI: 10.5220/0007568407940801
- 若原 涼, Ashwin Devanga, and 山内康一郎 (2019). 人と機械学習の協調による未知問題の解の探索法. In *The Proceedings of the 29th Annual Conference of Japanese Neural Network Society. JNNS2019P2-69*

PUBLICATIONS IN TUNNEL

- Ashwin Devanga, Emily Diaz Badilla and Mohammad Dehghanimohammadabadi : **Using Reinforcement Learning for Decision Making in Industrial Simulation Environments**. Winter Simulation Conference 2022.
- Peng Ren, Ashwin Devanga, and Mohammad Dehghanimohammadabadi : **Solving The Vehicle Routing Problem Using a Reinforcement Learning Approach**. Conference TBD.

CONFERENCES AND TALKS

- ICPRAM 2019 - Poster Presentation : **Collaborative Learning of Human and Computer: Supervised Actor-Critic based Collaboration Scheme**. Prague, Czech Republic.
- INFORMS Annual Meet 2021 - Session Chair and Speaker : **DM-Gym: A set of environments for developing reinforcement learning agents to solve Data Mining problems**. Anaheim, Los Angeles, CA, USA.