Devdhar Patel

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Website: **https://www.devdharpatel.com/**

EDUCATION

University of Massachusetts - Amherst, MA
[Aug 2019 - *present*]
PhD computer science (GPA : 3.9)
Advisor: Hava Siegelmann, Ph.D.

University of Massachusetts - Amherst, MA
[Aug 2017 - May 2019]
MS computer science (GPA : 3.89)

VIT University - Vellore, India
[2011 - 2015]
Bachelor of Technology in computer science and engineering (GPA : 7.92/10)
Thesis: "Universal Low Cost Sensor Interface Using GSM Module Capable of IOT"
Advisors: **Prof. Senthil J** and **Dr. Maria Ekstrand** (Professor, University of California San Francisco)

PUBLICATIONS

1. Patel, D., Russell, J., Walsh, F., Rahman, T., Sejnowski, T., & Siegelmann, H. (2023, June). Temporally Layered Architecture for Adaptive, Distributed and Continuous Control. In The 22nd International Conference on Autonomous Agents and Multiagent Systems (pp. 2830) (AAMAS 2023).

2. Gavier, I., Russell, J., Patel, D., Rietman, E., & Siegelmann, H. (2023, May). Neural Network Compiler for Parallel High-Throughput Simulation of Digital Circuits. In 2023 IEEE International Parallel and Distributed Processing Symposium (IPDPS) (pp. 613-623). IEEE.

3. Patel, D., Gavier, I., Russell, J., Malinsky, A., Rietman, E., & Siegelmann, H. (2022, July). Automatic Transpiler that Efficiently Converts Digital Circuits to a Neural Network Representation. In 2022 International Joint Conference on Neural Networks (IJCNN) (pp. 01-08). IEEE.

4. Tan, W., Kozma, R., & Patel, D. (2022). Optimization methods for improved efficiency and performance of Deep Q-Networks upon conversion to neuromorphic population platforms. Knowledge-Based Systems, 241, 108257.

5. Patel, D. & Kozma, R. (2020, July). Unsupervised Features Extracted using Winner-Take-All Mechanism Lead to Robust Image Classification. In 2020 International Joint Conference on Neural Networks (IJCNN 2020).

6. Tan, W., Patel, D., & Kozma, R. (2020). Strategy and Benchmark for Converting Deep Q-Networks to Event-Driven Spiking Neural Networks. arXiv preprint arXiv:2009.14456.

7. Patel, D., Hazan, H., Saunders, D. J., Siegelmann, H. T., & Kozma, R. (2019). Improved robustness of reinforcement learning policies upon conversion to spiking neuronal network platforms applied to Atari Breakout game. Neural Networks, 120, 108-115.

8. Saunders, D. J., Patel, D., Hazan, H., Siegelmann, H. T., & Kozma, R. (2019). Locally connected spiking neural networks for unsupervised feature learning. Neural Networks, 119, 332-340.

9. Hazan, H., Saunders, D. J., Khan, H., Patel, D., Sanghavi, D. T., Siegelmann, H. T., & Kozma, R. (2018). Bindsnet: A machine learning-oriented spiking neural networks library in python. Frontiers in neuroinformatics, 12, 89.

RESEARCH EXPERIENCE

Graduate Researcher, BINDS Lab, University of Massachusetts Amherst　　　　May, 2017 - present
Advisor: **Hava Siegelmann, Ph.D.** (Professor, University of Massachusetts Amherst)
• Neuroscience Inspired Time Aware artificial intelligence including early exits and adaptive control of agents
• Compiler for conversion of digital circuits to neural networks for parallel fast simulation
• Biologically-inspired and Biologically-plausible artificial intelligence. Including Spiking neural networks, generalization in neural networks, Reinforcement learning
• Involved in building a Python library for GPU-enabled Spiking neural network simulation

Tel-Me-Box: Validating and testing a novel, low-cost, real-time adherence monitoring device　　June, 2014 - present
Advisor: **Dr. Maria Ekstrand** (Professor, University of California San Francisco)
• Design and Manufactured portable low cost adherence monitor devices for a research study.
• The NIH funded research study is being conducted by University of California, San Francisco at   St. Johns Research Institute, Bangalore, India.
• More than 200 of these devices have been successfully deployed in remote areas.

Creation Labs, VIT University　　　　　　　　　　　　　　　　　March, 2014 - May, 2015
Advisor: **Dr. V. Raju** (then Vice Chancellor, VIT University, Vellore)
• Core member of a student-driven multidisciplinary lab established to carry out research projects and develop disruptive technologies in many different fields. http://creationlabs.in/
• Worked on various projects including Open projects, Adherence monitor device, UDK game demo and smart clock.
• Managed the lab on a day to day basis in terms of technical guidance, acquiring resources and organizing events.
• Mentored and overlooked various projects. Some notable projects include : **Traffic dashboard**, a smart traffic monitoring platform that won the ACM big data challenge, **Mars rover** built for the European rover challenge and a **smart irrigation system**.

PROFESSIONAL EXPERIENCE

GameChange Solutions, Dubai　　　　　　　　　　　　　　　　January, 2016 - May, 2017
Software developer
• Helped develop a gamified performance management and planning module for the banking industry.

Camel Port logistics, Mumbai
Software developer　　　　　　　　　　　　　　　　　　　　　January, 2015 - October, 2015
• designed and developed the platform for GPS tracking of vehicals via online portal.
• worked on developing the e-commerce website.

TEACHING EXPERIENCE

1. CMPSCI 591/691NR – Neuroscience and Engineering (Teaching associate Spring 2023) (Co-taught with Prof. Hava Siegelmann)
2. First Year Seminar – Neuroscience and AI (Teaching Associate Fall 2022)
3. INFO 150 - A Mathematical Foundation for Informatics (TA Spring 2024)
4. CMPSCI 383 - Artificial Intelligence (TA – Fall 2023)
5. CMPSCI 591/691NR – Neuroscience and Engineering (TA Spring 2022)
6. CMPSCI 335 - Inside the Box - How Computers Work (TA Fall 2020)
7. CMPSCI 690NR - Neural Networks and Neurodynamics (TA Spring 2020)
8. CMPSCI 383 – Artificial Intelligence (TA Fall 2019)

AWARDS

1. The Initiative on Neurosciences (IONs) Inspiration Award winner 2022
2. UMASS CICS Travel Grant 2023
3. UMASS CICS Travel Grant 2022

VOLUNTEERING & MENTORING EXPERIENCE

1. AI session for Massenberg Summer STEM Institute 2023 (10th grade students)
2. UMASS Undergraduate Research Volunteers (URV) Program Summer 2023
3. UMASS Undergraduate Research Volunteers (URV) Program Winter 2022-2023
4. UMASS Undergraduate Research Volunteers (URV) Program Summer 2021

TALKS

1. DARPA Microelectronics Automation Design Assurance Meeting (MADAM) 2022