

# MADAN BADUWAL

MS student in Computer Science

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## RESEARCH INTERESTS

My research interests lie in **Machine Learning, Computer Vision, Natural Language Processing, Embodied AI** and **Cognitive Science**. In particular, I am interested in reverse-engineering the human mind to build embodied machines that can see, listen, speak, learn, and interact with human-level cognition and social intelligence.

## EDUCATION

**University Of Texas Permian Basin**

*Computer Science(M.S)*

**Jan. 2023-Ongoing**

*Texas, USA*

**Tribhuvan University, Institute of Engineering**

*Bachelors in Computer Engineering*

**2015 – 2020**

*Kathmandu, Nepal*

- **Percentage: 72.38%**    **Rank : 2/43**

- **Relevant Courses:** Artificial Intelligence, Data Structures and Algorithms, Image Processing & Pattern Recognition, Multimedia System, Big Data Technologies, Software Engineering, Probability and Statistics, Linear Algebra, Computer Organization & Architecture, Microprocessor, Computer Network, Operating System, C, C++

## PUBLICATION

1. Prakash Ratna Prajapati, Samiksha Poudel, **Madan Baduwal**, S., Burlakoti, S., Pandey (Apr.2021). Signature Verification using Convolutional Neural Network and Autoencoder Journal of the Institute of Engineering ,16, No.1, pp.33-40

## INDUSTRY RESEARCH EXPERIENCE

**BP Eye Foundation**

*Sr. Machine Learning & Computer Vision Engineer*

**May 2022 – Nov 2022**

*Kathmandu, Nepal*

- Implemented semantic segmentation and detection algorithms for **otitis media** based on otoscopy images of the tympanic membrane with an accuracy of **85%** and deployed it as a scalable ML SAAS product on the Dell EMC server using the latest technologies of Django, React, Docker, Kubernetes, AWS, and CI/CD pipelines.

**Fusemachines**

*Machine Learning Engineer*

**Feb 2020 – Feb 2022**

*Headquarter: New York, USA*

- Led a team of engineers to develop an AI-enabled education platform: **fuseclassroom.com**, this platform was running around **60** colleges in Nepal, and **20k** students are already engaged in this platform.
- Worked on several client-based ML projects from the US as well as internal ML projects of the company in the field of Machine learning and **automated and optimized** these projects using MLOPS technologies DVC, MLflow, Github, Jenkins, Kubeflow, Apache Airflow, and Datadog.
- Involved in in-house training, workshops, math knowledge-sharing sessions, and paper reading sessions on deep learning.
- Democratized AI by doing research, design, review, and refinement of content - reading material, quizzes, assignments, and projects for Fusemachines **AI Education Programs** - "Micro Degree in Artificial Intelligence, Machine Learning, Computer Vision, Natural Language Processing"

**National Innovation Center**

*Computer Vision Engineer(R & D)*

**Jan 2021 – Dec 2021**

*Kathmandu, Nepal*

- Collaborated with mechanical, electrical, and electronic hardware teams for the deployment of computer vision tasks in robots to create initial prototypes for waiter and service **robots** within **9** months.
- Run simulation tests on docker and Gazebo, Integrated and deployed computer vision tasks in robots with **Edge Devices** like Tensor Processing Units and Jetson Nano, RaspberryPI.
- Created a few **rule base algorithms** from scratch using python3 to handle the motion and manipulation of the robot.
- Implemented several **computer vision tasks**: classification, Localization, Segmentation, Object Detection, Object Tracking, and Face Recognition using Pytorch. Worked on the whole computer vision pipeline.

**Omniblue.tech**

*Software Engineer Intern*

**Aug 2019 — Feb 2020**

*Kathmandu, Nepal*

- Designed and implemented scalable APIs and background workers for third-party extract data from unstructured documents using Django rest APIs and AWS that serve millions of requests daily.
- Designed and developed **web applications** using Front-end technologies HTML5, CSS, Bootstrap, Javascript, and backend technologies Flask, Django, and WordPress.

## TECHNICAL SKILLS

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**Languages :** Python3, C, C++, Java, Android, JavaScript, C#, Bash, HTML/CSS, SQL

**Python Packages :** Scipy, Numpy, Pandas, Matplotlib, Scikit-learn, Tensorflow, Opencv, NLTK, Fastapi, BeautifulSoup, Regex, Jupyter Notebook, Conda

**Databases and data warehouse :** PostgreSQL, MySQL, MongoDB, Snowflake

**Miscellaneous :** Django, Flask, React, Node, WordPress, AWS, Microservices, Tableau, Latex, Jira, Linux, Git, Github, Docker, Kubernetes, CI/CD, Mlflow, Robot Operating System(ROS), Gazebo, Arduino, R.pi, C.TPU, J.Nano, Unity, SEO

## ACHIEVEMENTS AND AWARDS

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### Tribhuvan University Merit-based scholarship

2015-2019

- Awarded for securing the highest GPA in the Computer Engineering cohort in the 1st, 2th and 4th semesters respectively. The scholarship was worth \$ 1000 each semester.

### Best Idea Winner

January 2017

- Best idea winner of the Exhibition organized by Kantipur engineering college and sponsored by Neosphere. Neosphere offered 6 month Ethical Hacking course, which was nearly worth \$ 200

### Hackathon Runner-up

March 2018

- 1st runner-up of hackathon organizes by Kathmandu University, kavre. The prize was worth \$100.

### Best Logic Code

July 2019

- Best Logic Code winner organized by Sagarmatha engineering college. The prize was worth \$60.

## PROJECTS

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### WMC Global | *Python3, Scikit-learn, Git, Github, AWS, Docker, Kubernetes, CI/CD*

jun 2021 - Dec 2021

- Classify websites into phishing and non-phishing using clustering algorithms for **GoDaddy, Bitly, InfoBip, and ICANN under WMC global**. Transformed unstructured data into structured data format using **RegEx**.

### Student Status Engine | *Python3, Snowflake, Scikit-learn, Git, AWS*

January 2021 - june 2021

- Created **feature extractor pipeline** that automatically extracts features from the data warehouse (eg: snowflake). Applied machine learning algorithms on extracted features to classify student status into different classes.
- Collaborated with back-end, front-end, and DevOps engineers to test and **deployed model into large-scale production**.

### AI-Robot | *Python3, TensorFlow 2.0, ROS, Gazebo, C.TPU, J. nano, R. Pi*

Jan 2021 – Sep 2021

- Retrain a classification model for Edge TPU using post-training quantization (**23fps, 85% mAP** score with pre-training), face recognition using python face recognition library, depth calculation using real sense depth camera, Centroid based object tracking, and write rule base algorithm from scratch.
- Integrated and tested computer vision tasks into ROS, gazebo simulation environment and **implemented it into waiter and service robot**. Visualize robot sensors data into rviz.

### Text Extractor | *Jupyter Notebook, Python3, OpenCV*

July 2019 - October 2020

- Research and experiment on building image preprocessing techniques like erosion and dilation.
- Build a Framework that uses google tesseract and regex to extract information from the form (eg: buyer name, seller name, etc.).

### Hastakshar | *Python3, OpenCV, Keras, Django*

2018-2019

- Research and experiment on Image Localization to improve classifier model using NumPy and OpenCV library.
- Built signature verification CNN classifier system using Tensorflow. Developed Django web interfaces in local machine.

### Android apps, Websites, and Packages | *C#, Unity, Python3, HTML, CSS*

2015 – 2019

- Android apps : Asteroid Smash, Antigravity Ball , Saveme , Beat Creator
- Web apps : horizonglobal.edu.np, youthcareer.edu.np
- Pypi package: **pip install madan**

## COURSES COMPLETED AND CERTIFICATIONS

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- Certified Ethical Hacking(CEH)-Neosphere
- Neural Networks and Deep Learning-Coursera
- Sequence Model-Coursera
- Effective Client Communication-Fusemachines

## EXTRA ACTIVITIES

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- Lite Exhibition Participant, Kantipur Engineering College, 2015, 2016, 2017, 2018
- Himalayan Exhibition (HEX) Participant, Himalayan College of Engineering, 2017
- AI Workshop Participant , MPercept Technology Pvt , 2019
- Data Science Workshop Participant, F1Soft International Pvt. Ltd., 2019