




MADAN BADUWAL

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RESEARCH INTERESTS

My research interests lie in **Machine Learning, Computer Vision, Natural Language Processing, Pattern Recognition, Multi-Model and Multi-Task Deep Learning**, and **Cognitive Science for Embodied AI**. 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

Tribhuvan University, Institute of Engineering

2015 – 2020

Bachelors in Computer Engineering

Kathmandu, Nepal

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

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

May 2022 – Ongoing

Sr. Machine Learning & Computer Vision Engineer

Kathmandu, Nepal

- **Research** on semantic-segmentation and detection algorithm for **otitis media** based on otoscopy images of the tympanic membrane with an accuracy of **85%**. Deployed it as a scalable ML SAAS product on the Dell EMC server by collaborating with multidisciplinary teams.

Fusemachines

Feb 2020 – Feb 2022

Machine Learning Engineer

Headquarter: New York, USA

- **Led** a team of engineers to develop an AI-enabled education platform: **fuseclassroom.com**. Currently, this platform is running around **60** colleges in Nepal, **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. Worked on the whole **Machine Learning pipeline**.
- Involved in in-house training, workshops, math knowledge sharing session, and paper reading sessions on Deep Learning.
- Involved in **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

Jan 2021 – Dec 2021

Computer Vision Engineer(R and D)

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 few **rule base algorithms** from scratch to handling the motion and manipulation for the robot.
- Worked on several **computer vision tasks** : classification, Localization, Segmentation, Object Detection, Object Tracking, and Face Recognition. Worked on the whole computer vision pipeline.

Omniblue tech

Aug 2019 — Feb 2020

Software Engineering(INT)

Kathmandu, Nepal

- Worked on **data structured and algorithms**, and different structured and unstructured database systems.
- Worked on designing and developing **web applications** using Front-end technology HTML5, CSS, Bootstrap, Javascript, and backend technology Flask, Django, and WordPress.

PROJECTS

WMC Global | *Python3, Scikit-learn, Git, AWS*

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, 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**

ACHIEVEMENTS AND AWARDS

Tribhuvan University Merit-based scholarship

2015-2019

- Awarded for securing the highest GPA in the Computer Engineering cohort in the 1st, 2nd 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.

COURSES COMPLETED AND CERTIFICATIONS

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

EXTRA ACTIVITIES

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

TECHNICAL SKILLS

Languages : Python3, C, C++, Android, HTML/CSS, SQL, PostgreSQL, MySQL

Tools : Scipy, Numpy, Pandas, Matplotlib, Scikit-learn, Tensorflow, Opencv, NLTK, Jupyter Notebook, Conda

Familiar : Tableau, Latex, Linux, MongoDB, Git, Github, Docker, Django/MVT, Flask, Mlflow, Robot Operating System (ROS), Raspberry pi, Coral TPU, Unity game engine, Networking, SEO, Wordpress