RAMKRISHNA ACHARYA

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Experiences

Working Student May 2023 – Present
Primetals Technologies Germany GmbH *Erlangen, Germany*

- Implemented event-based video classification using MMEngine and optimized models for deployment via TensorRT conversion for reducing inference latency.
- Developed a web framework using Python, FastAPI, and PostgreSQL functions to evaluate model performance by visualizing event occurrences, enabling rapid assessment of 100s of hours of video data within minutes.
- Developed a key point-based novel algorithm to detect the vibration of a static camera and propose the corrections based on the camera frames, which increased the precision of our anomaly detection systems.
- Built several synthetic data generator tools mimicking the real environment to train OCR, segmentation models, and detection models, which allowed us to train highly precise models.
- Conducted research and benchmarking to identify and implement the most effective loss functions and developed a novel function for U-Net and ViT-based semantic segmentation models, resulting in high-precision segmentation performance and optimized using ONNX and JIT.
- Benchmarked multiple anomaly detection algorithms, including STFPM, Reverse Distillation, PatchCore, and PaDiM, and developed a novel method tailored to our environment, resulting in improved anomaly detection performance.
- Reference Person: **Dominik Wasserman (dominik.wasserman@primetals.com)**
- Technologies Using: Python, PyTorch, MLFlow, OpenCV, MQTT, TensorRT, PostgreSQL, and Git

Freelancer Jan 2022 – Oct 2022
Upwork.com *Remote*

- As a top-rated freelancer, I helped clients turn their data applications into life.
- Built a dynamic alert-based strategy back-testing platform and trading bots for options and stocks using Polygon.ai, Alpaca, and Interactive Brokers API.
- Technologies Used: Python, FastAPI, Streamlit, MySQL, Asyncio, Websockets, and Git

Associate Data Scientist Aug 2021 – Aug 2022
Extensodata Pvt. Ltd. *Kathmandu, Nepal*

- Built a backbone for an intelligent model to automate data pipelining, analysis, and reporting of fintech data for business stakeholders to make timely customer decisions.
- Led a small team to build an Intelligence System that visualizes the performance of loans and prospects for stakeholders to make timely decisions.
- Technologies Used: Python, MySQL, Pentaho, Apache Airflow, Apache Superset, and Git

Junior Machine Learning Engineer Jan 2021 – May 2021
Ensemble-Matrix *Kathmandu, Nepal*

- Using Siamese-type neural networks, I developed an algorithm to create a synthetic hand signature to train a model to detect forged signatures.
- Technologies Used: Python, Google Colab, OpenCV, Keras, Docker, and Git

Unity3D Intern Nov 2020 – Mar 2021
diyo.ai *Kathmandu, Nepal*

- Designed and built a user flow for an application to improve clients' jewelry business using Google AR Core.
- Technologies Used: Unity3D, and Git

AI Developer Intern Aug 2019 – Jan 2020
MPercept Technology *Kathmandu, Nepal*

- Developed and maintained conversational agents for platforms like e-commerce, travel agency, and academic consultancy.
- Technologies Used: Python, Rasa, OpenCV, Google Colab, AWS EC2, and Git

Skills

Programming Languages: Python, C-sharp, JavaScript
Databases: MySQL, PostgreSQL, Firestore
ML/AI: PyTorch, TensorFlow, OpenCV, MMEngine, RoboFLow, HuggingFace
Data Engineering & MLOPs: Apache Airflow, Pentaho, MQTT, DVC, MLFlow
Data Visualization: Apache Superset, Plotly
Cloud & Dev Tools: AWS EC2, Linode, GitHub/GitLab Actions, Docker, Unity3D
Other Frameworks: PySide6, FastAPI, Websockets,
Human Languages: Nepali (Native), English (C1), German (A2)
Blogging: q-viper.github.io
YouTube Content Creation: DataQoil

Education

FAU Erlangen-Nuremberg — Germany
M.Sc. Data Science — *2022 – Oct 2025*

- Current Grade: 2.2
- Thesis (Ongoing): Enhancing Smart Grid Security: A Deep Learning Approach to Adversarial Intrusion Detection
- Courses: Deep Learning, Mathematics of Learning, Dynamical Systems Theory, etc.

Tribhuvan University — Nepal
B.Sc. Computer Science and Information Technology — *2015 – 2019*

- First Division, 72.07/100
- Courses: Probability and Statistics, Artificial Intelligence, Neural Networks, Advanced Java Programming, etc.

Research and Projects

Image Baker | *Python, PySide6, PyTorch, OpenCV* — 2025

- To tackle the need for highly curated labeled anomalous image data, I developed this package.
- This package allows us to label polygons and bounding boxes, and has model-assisted labeling, then those labels could be used to create layers of images to generate new labeled anomalous images.

Neural Template Matching | *Python, PyTorch, OpenCV* — 2024

- Experimented with a U-Net-based novel architecture do template matching.
- The model was trained on HPC using COCO data, and the test results were compared with SIFT.

Computer Vision Experiments | *Python, PyTorch, OpenCV* — 2024

- Along with a colleague, I am performing reproducible experiments like Grayscale to RGB conversion, Image Histogram Normalization, and Image Completion.

SmokeSim | *Python, PyGame, OpenCV, JavaScript* — 2024

- Built a reproducible smoke-simulating package that allows us to generate smoke over time and can be used as an image augmentation as well as segmentation.
- Using this package, I built a gesture-based smoke generation and improved many segmentation models.

Orange Segmentation With SAM | *HPC, Python, PyTorch, OpenCV* — 2024

- As an academic project, I evaluated SAM (Segment Anything Model) 1 and 2 for unseen orange datasets that I co-authored.
- Furthermore, results from the pre-trained SAM model were compared with newly trained U-Net, and results from fine-tuned SAM on HPC.
- **Project report.**

Gradient Based Methods on Large Least Squared Problems | *Python, PyTorch, Multiprocessing* — 2024

- As an academic seminar, I experimented with different gradient-based methods and their performance on the Large Least Squares Problems.
- Used PyTorch for parameter update and multiprocessing to run experiments simultaneously, and wrote a custom package on top of Matplotlib to animate parameter flow.
- **Seminar report.**

7 Days of Computer Vision Projects | *Python, Mediapipe, OpenCV* — 2021

- Completed 7 projects, including real-time background changing, gesture writing, games using gestures, and a gesture-based calculator.
- Wrote blogs on **my GitHub page**.

Corn Leaf Infection Detection | *Python, Google Colab, OpenCV* — 2020

- When corn plants in my village's farms were infected, I collected data for training a detection model.
- Open sourced the data at **Kaggle** and wrote a introductory blog at my GitHub page.

NEPSE Data Visualization | *Python, Pandas, BeautifulSoup, Streamlit* — 2020

- Wrote Python codes to scrape data from NEPSE (Nepal Stock Exchange) website and visualize it in real time.
- Wrote a blog at **my GitHub page**.

Contour Based Visually Writing System | *Python, Flask, OpenCV* — 2020

- Using OpenCV and NumPy, I made a tool to perform air drawing and added a visual user interface.
- Shared a blog at **my GitHub page**.

Devanagari Handwritten Word/Char Detection | *Python, Keras, Google Colab, OpenCV* — 2019

- As an academic project, I used a CNN model as a classifier and a novel algorithm to segment characters within a word.
- Wrote a blog at **my GitHub page**.