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**ROBIN NARSINGH RANABHAT**

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Machine learning engineer with experience in building customized solutions for Computer Vision, Natural Language Processing and Time Series Forecasting Problems.

*Current Interests: Computational Sustainability, Applied ML, Self-Supervised Learning*

## PROFESSIONAL EXPERIENCE

**Machine Learning Engineer** **COAC, Germany (remote)** **Feb 2022 - Present**

- Leveraged open source LLM (Llama) across company projects for :
  - Conservation Agent that allows end users to interact with ElasticSearch Database. Incorporated “ReAct” prompting pattern and self-correction loop for robustness.
  - Information extraction from unstructured documents : Safety Data Sheets, Technical Data Sheets.Primary Tools : llama.cpp, Mistral 7b Instruct
- Built automated weekly-running pipeline for experiment tracking, training, and deployment of a text-classification model. Primary Tools : Apache Airflow, Wandb, Catboost, AWS SQS
- Implemented GitOps practice through Flux CD that enabled easily manageable deployment of the overall infrastructure in the kubernetes cluster.
- Refactored a pdf-processing microservice into asynchronous pub-sub architecture that supports horizontal auto-scaling of the workers in the kubernetes cluster based on message-queue length.

**Machine Learning Engineer** **Docsumo, Nepal** **May 2022 - Jan 2023**

- Built a generic, robust system combining heuristics with a transformer based object detection model to extract tables from wide varieties of semi-structured Real Estate Rent Roll Documents.
- Added highly effective end-to-end tests as part of CI/CD pipeline to monitor decrease in accuracy and easily catch breaking changes.
- Researched on models for identifying small-objects (Deformable DETR, Yolo, RCNN) like checkboxes in documents and on the efficacy of visual question answering models (LayoutLM and Donut ) for invoices.

**ML Engineer Associate** **Fusemachines, Nepal** **Feb 2021 - Feb 2022**

- Supported data science team at T2-gaming to implement custom forecasting algorithms (log-log regression, RNNs) for sales forecasts of game titles that’s used by the marketing team for planning discounts.
- Researched on integration of social media signals such as comments, tweet counts, e.t.c associated with game-title to predict sales.

**ML Engineer Associate** **Fusemachines, Nepal** **Oct 2019 - Jan 2021**

- Involved in Email-Reply suggestion system that assists client’s Customer Service team in replying to 20 % of generic inquiry emails of repetitive nature. Contributed to Email-Category classification using SVM, Fine Tuned BERT model for the text-entailment problem.  
Primary Tools: Tensorflow, Spacy, Flask, AWS S3 & EC2
- Developed assignments, quizzes, programming-projects on Linear algebra, Computer-vision, and Probability for Fusemachines AI Education Programs : "Foundations in Artificial Intelligence" and "Micro-degree™ in Artificial Intelligence”.

## EDUCATION

Kathmandu University

Aug 2015 - Nov 2019

B.E, Computer Engineering

- **Relevant Coursework:** Calculus and Linear Algebra, Statistics and Probability, Data Structures and Algorithms, Operations Research, Artificial Intelligence, Discrete Structures, Operating Systems, Computer Architecture and Organizations, Machine Learning, Introduction to Environmental Engineering

## PROJECTS

- **Voice controlled Podcast Player (2021)** : Trigger word detection to play and pause music/videos in real-time based on the voice commands : “start” and “stop”. End-to-end research from preparing the custom training data, model architecture choice ( use of CNN + spectrogram rather than raw waveform for performance reasons ), data-augmentation and finally integrating everything as a [web-application](#). Primary Tools: Pytorch, Web Audio API, Flask, socket.io
- **Nepalese News Classifier and Recommender (2017)** : Experimented with effectiveness of Machine learning Algorithms ( KNN, SVM, Logistic Regression ) in classifying Nepalese news. Researched on text stemming approaches for nepali text and improving feature representation (document embeddings) by combining TF-IDF and word-vectors.

## ACHIEVEMENTS

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- **Prixa Excellence Award (2018)**

Our semester project : [Nepalese News Summarization](#) selected as the most innovative project amongst 24 other competing groups at Kathmandu University. It's an android application utilizing extractive summarization based on TextRank algorithm to create short summaries of nepalese news-articles.

- **Fusemachines AI Fellowship (2017)**

One of the 25 recipients of the Fusemachines AI scholarship out of a pool of 1000+ candidates, which covers 25% of the Master's degree program in Computer Science at Columbia University.

## ADDITIONAL COURSES AND CERTIFICATIONS

- NAAMII AI Winter School 2019, Pokhara  
*10-day intensive winter school with sessions by researchers from institutions such as MILA, ETH Zurich, Imperial College, MIT.*
- CSMM.102x: Machine Learning: ColumbiaX (<https://bit.ly/3c9OLk8>)
- Udacity: Deep Learning NanoDegree (<https://bit.ly/3c6r7VA>)
- Udacity: Deep Reinforcement Learning NanoDegree (<https://bit.ly/3wFRzic>)
- Coursera: Improving Deep Neural Networks (<https://bit.ly/3Fc94tM>)
- Coursera: Sequence Models for Time Series and Natural Language Processing (<https://bit.ly/3ncdr1R>)
- Assisted in computer vision and python workshops as part of ML Club at Kathmandu University

## SKILLS AND TECHNOLOGIES

- **Languages:** Python, C/C++, Javascript, Go
- **Machine Learning:** Pytorch, Scikit-learn, Tensorflow (Keras), Pandas, Numpy
- **Backend:** FastAPI, Flask, nats messaging, SQL
- **MLOps:** GitOps, Kubernetes and Docker, Airflow, CI/CD
- **Misc:** Software testing, Conceptual understanding of Unix, hiking, guitar, football