Reetesh Mukul

Principle Machine Learning Engineer | Architect

□*+918951163698 **@**reetesh.mukul@mail.com

♀*21043, PLH Varthur, Bangalore Karnataka



Machine Learning Engineer, Software Architect. Currently, I am working as Principal Machine Learning Engineer for Creative Advertisement. My work involves Computer Vision, Problem Modelling, Model devisement, Network Architecture, and System Evolution.

COMPÉTENCE

Domain Expertise Deep Learning, Statistics, Distributed Systems, Computer Vision, Classical Machine

Learning, Parallel Programming, Reinforcement Learning, Functional Programming,

Advanced Mathematics, Deep Learning

Programming Languages C++20, Python, Haskell, Java, Rust, Javascript, Lua

Frameworks BOOST, Keras, Tensorflow, Torch, Eigen3, OpenCV, LLVM, SqLite, MongoDB, Detec-

tron, DLib, MlPack, Redis, ONNX, CGAL,

Development Tools Visual Studio Code, Visual Studio, XCode, Intelli J Idea, Git

Tech Pieces LSTM, CNN, GAN, Pointer Networks, Linear Algebra, Batch Shop, Metaprogramming

(C++), Statistcial Programming

Operating Systems Mac OS X, Windows, Linux, RTOS(ARM, Snapdragon)

PROFESSIONAL EXPERIENCE

Today | Principle Machine Learning Engineer, HUAWEI, India

May 2021

> Ad Creative – Innovation, Design, Research and Development

Torch Advertisement GAN Tensorflow

Apr 2021

Machine Learning Developer, Adobe, India

Apr 2020

> Sensei: ML Model development and deployment

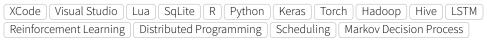
- > Visual Similarity Model Development
- > Panoptic Segmentation : Module development on Post Processing side.
- > Metric development for ML models.
- > Tensor Library development for a subset of PyTorch

Torch ONNX CoreML Keras Tensorflow CNN LSTM Clustering

Mar 2020 Sep 2016

Senior Software Developer | Machine Learning Engineer, ADOBE, India

- > Lightroom Performance : Performance enhancement for Lightroom Classic Import, Grid, and Library
- > Markov Decision Process-based Dynamic Algorithm for Import: Parallel Distributed Batch Allocation based on MDP.
- > Performance Database for Lightroom: Light-weight embedded Performance Database that Profiles Lua code automatically.
- > Common Table Expressions for folders, keywords. Facilitates very fast lightweight low latency queries.
- > Feature Prediction: Natural Language Model for Photographic Features. Predicts future features based on previous features.
- > Analytics for Lightroom.
- > ML Models for Churn analysis and Garbage Collection



Aug 2016

Senior Software Developer | Machine Learning Engineer, FLIPKART, India

Aug 2015

- > ML Model for Ad Click Prediction: CTR, CVR prediction and Ad Ranking
- > Ad SDK for Mobile Platform

Ads Native Ads Pandas R Ranking Sampling Android Thompson Sampling Distributed Programming

Jul 2015

Senior Software Developer | Machine Learning Engineer, QUALCOMM, India

Dec 2011

- > Optical Character Recognition for Indic (Devnagiri) Letters
- > Online detection of interesting scenes in Camera

Computer Vision C++ OpenCV Android Python Assembly Parallel Programming

Nov 2011

Software Developer, Qualcomm, India

June 2008

> Voice State Machine and Driver Development

C++ Embedded Systems Parallel Programming

May 2008

Software Developer, Texas Instruments, India

June 2006

> Global Positioning Systems software development

C++ Embedded Systems Assembly Language



PROJECTS

LRSENSEI (ADOBE) 2020 - 2021

Computer Vision Project Ranging From Best Photos, Auto Stacking to Panoptic Segmentation

Lightroom Sensei is a multiple-goal Computer Vision Project. Currently, I am working on Best Photos, Visual Similarity, and Panoptic Segmentation. My goal is to enhance and develop models, look for its deployment, try to find out suitable metrics, establish requirements by Users, and look for guarantees that different models provide. This work also involves choosing the deployment choices for the model -like can we put on client-side or on the server, how effectively jobs can be distributed on CPUs and GPUs.

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Torch ONNX CoreML Feature Pyramids Contrastive Learning
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LRPERFORMANCE (ADOBE) 2016 - 2020

Performance Enhancement and User Analysis for Lightroom Classic

Lightroom Performance Enhancement had four major directions -(a) Efficient Algorithms, (b) Deep Parallelism, (c) Better Resource management, and (d) Machine Learning to achieve goals associated with (a)-(c). In an adversarial environment where User requirements are unknown, where Computation is costly (as Lightroom is a Photography Application) and Operations are done on multiple assets at the same time(here assets are Images), the challenges become multi-faceted. We successfully used Common Table Expressions of Database and System Parallelism to gain Performance. Thereafter we deployed Classical Reinforcement Learning based solutions, Markov Decision Process and Bandits to estimate resources. This is a very new paradigm, which has been successfully productized. Some of the developments, for example for Grid, involved estimating Geometry shifts using Weibull Distribution. Other than Performance, we used User Log data to predict future features, User churn rate, Probability of user to convert. We even tried to do Garbage Collection in Lua using Reinforcement Learning.

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C++ Lua SqLite Markov Decision Process Reinforcement Learning Keras LSTM Hive Hadoop
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DEVNAGIRI OCR (QUALCOMM)

2011 - 2015

Optical Character Recognition for Devnagiri

. We developed Optical Character Recognizer for Indic (Devnagiri) Characters. We developed both Char Decoders and Word Decoders. This solution was developed for Mobile Devices hence challenges were on performance side as well. One of my goals was to develop cache aware vector routines. I developed Algorithm for Chandrabindu development and also wrote modules for Word Decoders.

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C++ Computer Vision Machine Learning Android
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Papers and Patents

- 1. Photo-editing application, Patent number: 10884769
- 2. Markov Decision Process for Efficient Data Transfer
- 3. Context-based Recommendation System for Feature Search
- 4. Environment Aware Application-based Resource Management Using Reinforcement Learning
- 5. Automatic Teeth Whitening Using Teeth Region Detection And Individual Tooth Location , United States Patent Application 20200342586
- 6. Photo-Editing Application Recommendations
- 7. Parameter Estimation for Accelerometers, Processes, Circuits, Devices and Systems. https://patents.google.com/patent/US20090259424A1/en

- 8. Broadband Hf/Vhf/Uhf Communication on Power Lines. https://patents.google.com/patent/WO2007000777A1/de.
- 9. R. Mukul et al., "An adaptive bandwidth request mechanism for QoS enhancement in WiMax real time communication," 2006 IFIP International Conference on Wireless and Optical Communications Networks, Bangalore, 2006, pp. 5 pp.-5, doi: 10.1109/WOCN.2006.1666583.

EDUCATION

2006 M.Tech [IIITB Bangalore]

2004 B.Tech [BIT Sindri]





+ Forces

- > Learner
- > Passionate
- > Motivated
- > Autonomus