Reetesh MUKUL

Principle Machine Learning Engineer | Architect

linkedin.com/in/reetesh-mukul-5392532 github.com/reeteshmukul

*IN : +91 89511 63698 *SG : +65 9192 4323 reetesh.mukul@gmail.com

*21043, PLH Varthur, Bangalore Karnataka

Deep Learning Engineer and Software Architect. Currently, I am working as Principal Machine Learning Engineer in Creative Advertisement Domain. My work involves Deep Learning, Computer Vision, and Ad Analysis, Ad Generation.

Compétence

Domain Expertise	**Deep Learning**, **Statistics**, Bayesian Programming, Computer Vision, Advanced Mathematics, Classical Machine Learning, Parallel Programming, Reinforcement Learning, Functional Programming, Distributed Systems,
Programming Languages	**C++20**, **Python**, Haskell, Rust
Frameworks	**BOOST**, **Torch**, **Keras**, **Tensorflow**, **OpenCV**, **PyRO**, **sklearn**
Development Tools	**Visual Studio Code**, **Visual Studio**, **XCode**, IntelliJ Idea, Git
Tech Pieces	**Transformers**, **CNN**, **Bayesian Programming**, **Pointer Networks**, Linear Algebra, Batch Shop, Metaprogramming (C++), Statistcial Programming

Professional Experience

Today – Dec 2022 — **Principle Machine Learning Engineer, Huawei, India**

My role is to conduct and coordinate Research Initiatives associated with Ad Creatives – understanding the content of the Advertisements and the cognitive interactions between various Ad Elements and users. The area thus involves Computational Advertisement, Creatives Psychology, Computer Vision, Cognitive analysis and Bayesian Programming. Most of my work requires developing Deep Learning Vision Models, Text Attention Models involving Advertisements. I work extensively on Neural Architectures, Image Attention, Transformers, Saliency and Memorability.

Torch | Bayesian Programming | Vision Transformers | CLIP | Denoising Diffusion

Nov 2022 – May 2021 — **Principle Machine Learning Engineer, Huawei, India**

- Ad Creative – Deep Learning-Driven Advertisement Creation. I work on Automatic Advertisement Creation ; and Creative Ranking using various compositional aspects involving Advertisements. All factors, like – Industry, Product, Market, Users, Arts ; – are involved. The system involved learning the causal impact of each component on the overall performance. My work further involves several CNN/Transfomer based tools for Visual Analysis, Cognitive Analysis, Bayesian Programming for Reasoning, a few NLP and Sequential tools for learning the text impact, and Graphical Neural Network for understanding the connection among components.
- Saliency Prediction – Network Development to predict Saliency
- Blur Prediction – Network Development to predict Blur
- Memorability – Network Development to preduct Memorability

Torch | Advertisement | VisionTransformers | Memorability | Cognition | Denoising Diffusion

Apr 2021 – Apr 2020 | **Machine Learning Developer, Adobe, India**

- 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

XCode | Visual Studio | Lua | SqLite | R | Python | Keras | Torch | Hadoop | Hive | LSTM | Reinforcement Learning | Distributed Programming | Scheduling | Markov Decision Process

Aug 2016 – Aug 2015 | **Senior Software Developer | Machine Learning Engineer, Flipkart, India**

- 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 – Dec 2011 | **Senior Software Developer | Machine Learning Engineer, Qualcomm, India**

- 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 – June 2008 | **Software Developer, Qualcomm, India**

- Voice State Machine and Driver Development

C++ | Embedded Systems | Parallel Programming

May 2008 – June 2006 | **Software Developer, Texas Instruments, India**

- Global Positioning Systems software development

C++ | Embedded Systems | Assembly Language

Projects

Creative Advertisement (Huawei) 2021 - Current

Automatic Advertisement Creation keeping Ad Composition and Consumer Psychology in perspective

Creative Advertisement is the process and system for Creating Advertisements in an automated way. We study the dynamics of Market, Industry, Product, User, and Arts to create Advertisements. The created Advertisements are supposed to influence the Emotions and Psychology of the User so that there is a positive impact on the Product and the Brand.

Torch | Congitive Sciences | Bayesian Programming | Computer Vision

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. I was 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.

Torch | ONNX | CoreML | Feature Pyramids | Contrastive Learning

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.

C++ | Lua | SqLite | Markov Decision Process | Reinforcement Learning | Keras | LSTM | Hive | Hadoop

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.

C++ | Computer Vision | Machine Learning | Android

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]

Languages

English ●●●●●
Hindi ●●●●●

Forces

- Learner
- Passionate
- Motivated
- Autonomus