

Vikramank Singh

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4 years experience | Machine Learning | Reinforcement Learning | Vision & Control

EDUCATION

University of California, Berkeley

Berkeley, CA

Masters Degree, Information Systems | Focus: **Machine Learning, Statistics**

Aug 2018 - May 2020

- **Relevant Coursework:** Optimization Models, Statistical Learning Theory, Machine Learning for Systems, Deep Reinforcement Learning, Applied Machine Learning, Quantitative Research, Information Retrieval

University of Mumbai

Mumbai, India

Bachelor's Degree, Computer Engineering | Focus: **Artificial Intelligence**

2012 - 2016

- **Relevant Coursework:** Algorithms and Data Structures, Linear Algebra, Probability and Statistics, Operations Research, Artificial Intelligence, ERP and Supply Chain Management, Big Data Analytics

SKILLS

- **Research Interests:** Reinforcement Learning, Machine Learning, Optimization, Statistical Inference
- **Technical Skills:** Python, C/C++, Git, R, MATLAB, MongoDB, SQL, D3, NodeJS
- **Frameworks:** TensorFlow, PyTorch, Keras, Caffe, Scikit Learn, Numpy, Pandas, Simpy

WORK EXPERIENCE

Ericsson AI

Santa Clara, CA

Machine Learning Scientist | Intern & Part-time

June 2019 - Present

Project: **Automating Recommendation Engines using ML for Throughput Maximization in Digital Networks**

- Developing novel deep learning methods in order to automate the recommendation engines for building base stations in a given geographical area of more than 100,000 users to maximize throughput and minimize latency.

Project: **Sequential Decision Making for Optimal Antenna Tilt using ML in Production**

- Used Apprenticeship learning via Inverse Reinforcement Learning to learn an latent reward function from historical expert data and then learn a policy to minimize the interference by finding the right tilt for a system of antennas.

Facebook, Inc

Menlo Park, CA

Software Engineer (Machine Learning) | Connectivity Lab

July 2016 - Aug 2017

- Developed an automatic generative algorithm to create street addresses from satellite images by learning and labeling roads and regions. Trained various models like **SegNet**, **U-Net**, **VGG** and **ResNet** for segmentation and detection.

RESEARCH EXPERIENCE

UC Berkeley

Berkeley, CA

Graduate Researcher

June 2018 - Present

Project: **Deep Reinforcement Learning for Smart Factory Optimization** (*Western Digital Corp*)

- Training RL policies, in a non-stationary stochastic environment, to assign jobs to 500 machines inside a manufacturing unit. Our research deals with problems like delayed reward, uncertainty modeling and random failures.

Project: **Health Monitoring of Large Scale Production Systems using Reinforcement Learning** (*Hitachi AI Lab*)

- Building sequential decision making models using noisy time series data of machine degradation over time. Using variational inference to learn latent state of machine and RL to train policies that monitor health of the system.

Project: **CycleGAN for cross-modal image synthesis from unpaired data** (*UCSF*)

- We aim at performing a MR-to-CT synthesis as MRI has poor contrast for bone structures but is used along with CT to identify muscles structures and diagnose osteonecrosis.

MIT Media Lab | Stealth Mode Research, EyeWire

Boston, MA

Researcher (Deep Learning | Computer Vision)

Sept 2017 - Mar 2018

- Trained several pose estimation models like **OpenPose** and **DensePose-RCNN** in pytorch framework to detect yoga poses real-time and deployed it on mobile platforms. Advised by **Dr. Ramesh Raskar** from MIT Media Lab.

INDIVIDUAL PROJECTS

- **Accelerating human learning with AI** (*Capstone Project*)

Berkeley, CA

Learning a model on data from procedural learning tasks in order to predict the best sequence (blocked v/s interleaved) in which humans should learn a concept to maximize memory retention.

- **Bootstrapping: A multi-expert reinforcement learning approach** **Berkeley, CA**
Trained an agent to learn from multiple experts together such that once trained, it could beat each one of those experts individually. Implemented the **DQfD / DDPGfD** and **Hierarchical RL** to learn from diverse expert policies.
- **Federated Reinforcement Learning for heterogeneous environments** **Berkeley, CA**
Built distributed RL algorithms that could train sequentially and parallelly in several heterogeneous environments in a federated setting. The federated element preserves the privacy and the distributed element helps in diverse learning.

INTERNSHIPS

DRDO, Ministry of Defence, Government of India

New Delhi, India

Undergraduate Researcher (Machine Learning) | INMAS Lab

Nov 2015 - May 2016

- Developed **unsupervised learning** algorithms to identify important features in order to detect workload in soldiers' brains using 14, 64, 256 channel EEG data.

Red Hat, Inc.

Pune, India

Data Science Intern | GBS

June 2015 - Sept 2015

- Developed real-time analytical dashboards using **R Shiny** to predict sales every quarter.
- Predicted sales using various forecasting models like **SMA, Time series, Holt Winters, Exponential smoothing**.

Indian Academy of Sciences

Bangalore, India

Research Fellow | Data Science

May 2014 - Oct 2014

- Used a **core-periphery structure model** to detect the spread of virality in an online social network.
- Developed a **Preferential Attachment Model** to demonstrate real time **Facebook Graphs** and tested those models on a citation and the collaboration network formed in the field of high energy physics theory.

OTHER RELEVANT COURSES

Stanford CS231n **Convolutional Neural Network for Visual Recognition**, Stanford CS224N **NLP with Deep Learning**, Stanford CS288 **Probabilistic Graphical Models**, Berkeley CS287 **Advanced Robotics**, MIT18.065 **Signal Processing for Machine Learning**, MIT 6.262 **Discrete Stochastic Processes**

CONFERENCES AND TALKS

TEDx speaker on “*Revolutionizing Yoga using AI*” at TEDxMahindraEcoleCentrale in 2018. [\[Video\]](#)

Keynote speaker on “*Deep Learning for NLP*” at **International Deep Learning Summit 2017, Singapore**. [\[Link\]](#) [\[Video\]](#) [\[Link\]](#)

Keynote speaker on “*Deep Learning for Browsers (ConvNetJS)*” at **International Cloud Summit HostingCon 2017**. [\[Video\]](#)
