

Aman Raj

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M.S. in Electrical & Computer Engineering • University of California San Diego

EDUCATION

UNIVERSITY OF CALIFORNIA SAN DIEGO

M.S. IN ELECTRICAL &
COMPUTER ENGINEERING
2018-2020

DELHI TECHNOLOGICAL UNIVERSITY (DCE)

B.TECH IN ELECTRONICS &
COMMUNICATION ENGINEERING
2012-2016 | Aggregate: 82.52%

SPRING MEADOWS PUBLIC SCHOOL

Class XII (CBSE) | 2012
Aggregate : 95.0%, 1st in School
Class X (CBSE) | 2010
CGPA : 9.8/10

LINKS

Facebook Research:// [raj-aman](#)
Google Scholar:// [Aman Raj](#)
Linkedin:// [amanrajdc](#)
Github:// [amanrajdc](#)

COURSEWORK

Advance Engineering Mathematics
Design and Analysis of Algorithms
Probability & Stochastic Processes
Probability & Statistics for Data Science
Computer Architecture
Robotics & Object Tracking
Pattern Recognition
Digital Image Processing
Computer Vision

Coursera:

Machine Learning *by Pedro Domingos*
Neural Networks for Machine Learning
by Geoffrey Hinton

TECHNICAL SKILLS

Programming Languages:
Python • C • C++ • Java • Scala • Lua
LaTeX • Matlab • Octave • Javascript
ML Frameworks/Others:
Caffe2 • PyTorch • Tensorflow • Torch
Chainer • H2O.ai • Theano • OpenCV
AWS • Git • Apache-Storm • MongoDB
Apache-Spark • SQL

WORK EXPERIENCE

FACEBOOK INC. | SOFTWARE ENGINEER (AI)

Aug 2016 – Aug 2018

- Developed machine learning solutions to automate generative satellite map processing. Experimented with Convolutional LSTM models to address connectivity issues in generated road vectors.
- Worked in **Applied Machine Learning (AML)** group with **Manohar Paluri**. Designed and implemented distributed learning workflows in Caffe2 for large-scale training on satellite images which reduced training time from days to hours.
- Worked with **Ramesh Raskar** and Developed deep CNN architectures for semantic segmentation using large amounts of annotated and weakly annotated data. All the code was open-sourced.

SUPPLYAI INC. | DATA SCIENTIST

Dec 2015 – July 2016

- Designed and implemented the predictive intelligence in company's first product Velo. Built the backend of software using H2O.ai with a mix of Scala, Java, Python.
- Skills gained in Data Analysis, Data Munging, Data Visualization, Feature Engineering, Feature Selection, developing data-centric software pipeline.

RIGHT RELEVANCE INC. | DATA SCIENCE INTERN

Dec 2015 – Feb 2016

- Fixed bugs in existing Apache-Storm topologies to improve data mining. Wrote custom rules in javascript for extraction of articles from URLs in tweets.

RESEARCH EXPERIENCE

UNIVERSITY OF CALIFORNIA SAN DIEGO

Graduate Student Researcher | Sept 2018 – Present

- Developing state-of the art semi-supervised and unsupervised learning algorithms to understand depth, motion and semantic information in videos for autonomous driving car.

CARNEGIE MELLON UNIVERSITY

Summer Research Intern | Jun 2015 – Aug 2015

- **"Multi-Scale Convolutional Architecture for Semantic Segmentation"**
Worked in **AirLab** at Robotics Institute, implemented a novel multi-scale Deep Convolutional Neural network for semantic labeling of 2D scenes for indoor and outdoor scene understanding.

Winter Research Intern | Dec 2014

- Worked on **Comic Polyglot** project with **Bhiksha Raj** in **CMU IPTSE Winter School 2014**, implemented a convolutional neural network-based system for detecting text ROIs in manga comic strips followed by neural translation.

AWARDS AND ACCOMPLISHMENTS

- **Best Paper Award:** for "Robocodes" in **CVPR 2017** workshop on Earthvision.
- **Best Project Award:** for "Comic PolyGlott" in **CMU IPTSE Winter School 2014**.
- **CSSS Scholarship:** by Govt. of India for undergraduate studies, 2012-2016.
- **All India Rank 312:** in National Science Talent Search Examination, 2012.
- **Academic Excellence Award:** in high school for 2011-2012 academic session.
- Selected for **Inspire Science Camp** by Dept. of Sci & Tech, Govt. of India in 2011.
- **Silver Certificate:** in HDFC Bank Meritus Scholarship, 2009.

PUBLICATIONS

- Ilke Demir, Forest Hughes, **Aman Raj**, Kaunil Dhruv, Suryanarayana Murthy, Sanyam Garg, Barrett Doo, Ramesh Raskar. "A Holistic Framework for Addressing the World using Machine Learning". **CVPR 2018** workshops.
- Ilke Demir, Forest Hughes, **Aman Raj**, Kaunil Dhruv, Suryanarayana Murthy, Sanyam Garg, Barrett Doo, Ramesh Raskar. "Generative street addresses from satellite imagery". International Journal of Geo-Information (**ISPRS 2018**).
- Ilke Demir, Forest Hughes, **Aman Raj**, Kleovoulos Tsourides, Divyaa Ravichandran, Suryanarayana Murthy, Kaunil Dhruv, Sanyam Garg, Jatin Malhotra, Barrett Doo, Grace Kermani, Ramesh Raskar. "Robocodes: Towards Generative Street Addresses from Satellite Imagery". **CVPR 2017** workshop on Earthvision. (**best paper award**)
- R. Rohilla, **Aman Raj**, Saransh Kejriwal, and R. Kapoor. "FPGA Accelerated Abandoned Object Detection". IEEE's International Conference on Computational Techniques in Information and Communication Technologies (**ICCTICT 2016**).
- **Aman Raj**, Daniel Maturana, and Sebastian Scherer. "Multi-Scale Convolutional Architecture for Semantic Segmentation". Robotics Institute Technical Reports. CMU-RI-TR-15-21, 2015.
- N. Jayanthi, Ayush Tomar, **Aman Raj**, S. Indu, and Santanu Chaudhury. "Digitization of Historic Inscription Images using Cumulants based Simultaneous Blind Source Extraction". In Proceedings of **ICVGIP 2014**. ACM, Article 51, pp. 1-6.
- S. Indu, Ayush Tomar, **Aman Raj**, and Santanu Chaudhury. "Enhancement and Retrieval of Historic Inscription Images." In Computer Vision-**ACCV 2014** Workshops, pp. 529-541. Springer International Publishing, 2014.
- **Aman Raj**, P. Selvan, A. Dixit, Gaurav Bansal, H. Solanki and F. Abbas, "Comic Polyglot", CMU IPTSE Winter School Poster Session, 2014. (**best project award**)

UNDERGRADUATE PROJECTS

- **"FPGA Accelerated Abandoned Object Detection"**
Designed a standalone system that uses a static background modeling algorithm and identifies any object lying abandoned for a given specified time. Implemented it on Xilinx FPGA board to accelerated algorithm's performance.
- **"NASA Lunabotics Mining Project"**
Worked in a team to develop a lunar rover to participate in NASA Lunabotics Mining Competition 2013. Designed and fabricated various electronic circuits for control and locomotion system of rover.
- **"Historical Inscriptions Extraction"**
Developed an ICA based algorithm that extracts textual information from historical inscription images-containing high correlation between signal and noise. The aim was to extract and preserve such inscriptions digitally.
- **"Robot Navigation System Using Xbox Kinect"**
Built a navigation system for a robot using OpenCV and OpenKinect libraries, that uses disparity map along with pixel intensity calibration to compute the distance of an object/obstacle from the Xbox Kinect.
- **"Biometrics Security And Monitoring System"**
Developed a system prototype using BeagleBone Black and RGB camera for purpose of authorizing access and remote monitoring in Robotics Lab at DTU. The system uses a combination of real-time facial recognition and activity monitoring and periodically sends this information to lab-in charge on WhatsApp.

PROFESSIONAL SERVICE

- Since 2018 reviewing research papers for **IEEE Transactions on Image Processing**.