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
(Machine Learning & Data Science)
2018-2020 | GPA: 3.58/4.0

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%, 1^{st} in School

LINKS

Google Scholar:// **Aman Raj**
Linkedin:// **amanrajdce**
Github:// **amanrajdce**

COURSEWORK

EC-4129: Robotics & Object Tracking
EC-4133: Pattern Recognition
EC-401: Digital Image Processing
ECE225: Prob & Stats for Data Science
CSE252A: Computer Vision I
ECE269: Linear Algebra and Application
CSE250B: Learning Algorithms
CSE291: Advances in 3D Reconstruction
CSE252C: Computer Vision III
CSE256: Statistical NLP

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

TEACHING ASSISTANT

CSE12: Data Structure & OO Design

WORK EXPERIENCE

FACEBOOK INC. | Software Engineer (AI)
Aug 2016 – Aug 2018

- Developed machine learning solutions to automate generative satellite map processing such as fixing connectivity issues, split/merge, etc.
- 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 H20.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
Intern | Winter: Dec 2014 | Summer: 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.
- 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

- **The Jack Dangermond Award:** for paper in **ISPRS 2018**, awarded with prize money of **USD 10,000** and certificate for best paper award.
- **Best Paper Award:** for "Robocodes" in **CVPR 2017** workshop on Earthvision.
- **Best Project Award:** for "Comic PolyGlot" 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.
- **Silver Certificate:** in HDFC Bank Meritus Scholarship, 2009.

PUBLICATIONS

- Yue Meng, Yongxi Lu, **Aman Raj**, Samuel Sunarjo, Rui Guo, Tara Javidi, Gaurav Bansal, Dinesh Bharadia. "SIGNet: Semantic Instance Aided Unsupervised 3D Geometry Perception". **CVPR 2019**, *arXiv:1812.05642*.
- 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**. **(award)**
- 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, **CMU 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** reviewer for **IEEE Transactions on Image Processing.**