Romil Bhardwaj

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EDUCATION

Indraprastha Institute of Information Technology (IIIT), Delhi, India 2011 – 2015
B.Tech. with Honors, Computer Science and Engineering
Minor in Economics, GPA - 8.85/10
Honors Thesis: *Augmenting Face Recognition with Social Context*

RESEARCH EXPERIENCE

Microsoft Research Jul 2015 – Present
Research Fellow, Mobility, Networks and Systems Group Bangalore, India
Mentors: Dr. Ramachandran Ramjee, Dr. Krishna Chintalapudi

- **Wireless Systems** - Conducted research on coexistence of heterogeneous transmit power nodes in wireless networks. Developed & implemented a new carrier sensing technique[2] for IEEE 802.11 MAC protocol, restoring throughput fairness in power-diverse networks. Published at NSDI 2017.
- **Vision + ML Systems** - Spearheaded the unsupervised traffic camera calibration research efforts. Proposed and implemented crowdsourcing, deep learning and calibration pipelines to automatically calibrate cameras[1]. Work published at BuildSys 2017 and received best paper and best demo awards.

WORK EXPERIENCE

Microsoft Corp. Apr 2014 – Jul 2014
Software Development Engineer - Intern Hyderabad, India

- Built a high-performance data transformation adapter for Microsoft BizTalk Azure. One of the 2 intern projects to be later shipped to production.

PUBLICATIONS

[1] **R. Bhardwaj**, G. Tummala, G. Ramalingam, R. Ramjee and P. Sinha, "AutoCalib: Automatic Traffic Camera Calibration at Scale" in *Proceedings of **ACM BuildSys***, Delft, Netherlands, 2017. **(Best Paper and Best Demo)**

[2] **R. Bhardwaj**, K. Chintalapudi and R. Ramjee, "Skip-Correlation for Multi-Power Wireless Carrier Sensing" in *Proceedings of USENIX Networked Systems Design and Implementation **(NSDI)***, Boston, MA, 2017.

[3] **R. Bhardwaj**, G. Goswami, R. Singh and M. Vatsa, "Harnessing Social Context for Improved Face Recognition" in *Proceedings of IEEE International Conference on Biometrics **(ICB)***, Phuket, Thailand, 2015.

[4] G. Goswami, **R. Bhardwaj**, R. Singh and M. Vatsa, "MDLFace: Memorability Augmented Deep Learning for Video Face Recognition" in *Proceedings of IEEE International Joint Conference on Biometrics **(IJCB)***, Clearwater, FL, 2014.

AWARDS & ACHIEVEMENTS

Best Paper, ACM BuildSys 2017
Best Demo, ACM BuildSys 2017
National Finalist, Soccer League, Indian Robot Olympiad 2013
Among the top 0.1% candidates in pan-India high school science examination, 2009

UNDERGRAD RESEARCH PROJECTS

SCADA Deployment at IIIT-Delhi goo.gl/DAv13S
with Prof. Amarjeet Singh 2013
Part of the Energy@IIIT-Delhi group that deployed systems to collect data from 200+ energy meters and AHU controllers across the campus. Wrote RS-232 ModBus & BACnet Python/C drivers for Raspberry Pis to collect, cache and relay data, collecting over 1 million data points every day.

Learning Deep Representations for Face Recognition in Videos
with Prof. Mayank Vatsa & Prof. Richa Singh 2014
Implemented a new measure [4] for quantifying face feature richness based on the Shannon entropy of image patches. Used denoising autoencoders to learn lower dimensional representations of face images & perform face recognition. Achieved performance comparable to Facebook's state-of-the-art DeepFace.

Inferring Social Structures from Group Photographs goo.gl/UqkciL
with Prof. Mayank Vatsa & Prof. Richa Singh 2014
Designed algorithms [3] to generate social graphs from collections of group photographs and leveraged them to augment face recognition systems. Generated a Python/D3 visualization of the inferred social graph for IIIT-Delhi's class of 2015.

CarDashian – In-Car Navigation Sans Distractions youtu.be/SynXm6Z7fcQ
Built a low cost solution using Android phones to project navigation directions and speed directly onto a car's windscreen without any dedicated hardware. Adjudged the "Most Innovative Project" in the intro to HCI course at IIIT-Delhi, Winter 2014.

TEACHING EXPERIENCE

Teaching Assistant, MTH-201 Introduction to Probability and Statistics
One of the very few undergraduate teaching assistants. Conducted tutorials, office hours, designed and graded assignments and quizzes.

TALKS

AutoCalib: Automatic Traffic Camera Calibration at Scale
Conference Talk
BuildSys 2017, Delft, Netherlands (Co-located with SenSys)

Skip-Correlation for Multi-Power Wireless Carrier Sensing
Conference Talk **(Video: goo.gl/XRUQz2)**
NSDI 2017, Boston, MA

PATENTS

Skip-Correlation based Symmetric Carrier Sensing with Multiple Power Levels
USPTO 20170374618

ACTIVITIES & VOLUNTEERING

Chairman, ACM Student Chapter, IIIT-Delhi 2013 – 2014
Organized hackathons, reading sessions and secured funding from corporate sponsors.

Design and Delivery, Campus Newsletter, IIIT-Delhi 2012 – 2014
Managed visual design and delivery for the bi-annual newsletter with 3500+ recipients.

Teaching Volunteer, Child Rights and You, Delhi 2012
Taught underprivileged children arithmetic and counting in understaffed schools in the slums of Delhi.

SKILLS & LANGUAGES

Languages
Python, C, C++, C#, Java, GoLang
Libraries and Frameworks
Numpy, Tensorflow, OpenCV, Android, Pandas, Caffe, Keras, Scikit, Django, Celery, D3, Xilinx ISE, MongoDB
Hardware
Raspberry Pi, Beaglebone, WARP, Xilinx Virtex 6

REFERENCES

Dr. Ramachandran Ramjee
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Dr. Krishna Chintalapudi
Researcher, Microsoft Research Redmond
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Dr. Mayank Vatsa
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