Rahul Anand Sharma

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Education

- **Carnegie Mellon University** — Pittsburgh, United States
  PhD, Department of Electrical and Computer Engineering — *Aug. 2018 –*
- **International Institute of Information Technology** — Hyderabad, India
  B.Tech and MS By Research in Computer Science — *July. 2012 – July. 2016*

Preprints

- **Rahul Anand Sharma**, & Ranveer Chandra *"DeepEdge"*
- Vasuki Narasimha Swamy, Deepak Vasisht, Zerina Kapetanovic, **Rahul Anand Sharma**, Ranveer Chandra, Manohar Swaminathan, Anirudh Badam, Gireeja Ranade & Sudipta Sinha *"TYE: A practical Long-duration Large-area Aerial Imaging Platform"*
- **Rahul Anand Sharma**, Praneeth Netrapalli, Navin Goyal & Monojit Choudhary *"Learnability of Learned Neural Networks"*

Publications

- Tusher Chakraborty, Akshay Nambi, Ranveer Chandra, **Rahul Anand Sharma**, Manohar Swaminathan, Jonathan Appavoo & Zerina Kapetanovic *"Fall-curve: A novel primitive for IoT Fault Detection and Isolation"* ACM Conference on Embedded Networked Sensor Systems (SenSys), 2018
- **Rahul Anand Sharma**, Bharath Bhat, Vineet Gandhi & C.V. Jawahar *"Automated top view registration of broadcast football videos"* IEEE Winter Conference on Applications of Computer Vision (WACV), 2018
- **Rahul Anand Sharma**, Visesh Chari, Vineet Gandhi & C.V. Jawahar *"Automatic analysis of broadcast football videos"* Springer Journal on Signal, Image and Video Processing (JOSIVP), 2016
- **Rahul Anand Sharma**, Pramod Kompalli & C.V. Jawahar *"Fine-Grain Annotation of Cricket Videos"* Asian Conference on Pattern Recognition (ACPR), 2015
- Himangi Saraogi, **Rahul Anand Sharma** & Vijay Kumar *"Event Recognition in Broadcast Soccer Videos"* Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), 2016

Patents

Filed two patents on DeepEdge

Experience

- **Microsoft Research** — Bangalore, India
  Research Fellow — *Aug 2016 - July 2018*
  - **FarmBeats**: Working with Dr. Ranveer Chandra & Dr. Manohar Swaminathan on FarmBeats: IoT for agriculture. Our mission is to improve farming through data-driven practices. We are inventing new ways to gather data, to store them in the cloud, and provide the analytics to the farmers.
  - **Learnability of Neural Networks**: Together with Dr. Praneeth Netrapalli & Dr. Navin Goyal, we are exploring the simplicity of learned neural networks under various settings: learned on real vs random data, varying size/architecture and using large minibatch size vs small minibatch size. The notion of simplicity used here is that of learnability i.e., how accurately can the prediction function of a neural network be learned from labeled samples from it.
  - **DeepEdge**: In collaboration with Dr. Ranveer Chandra, we propose a new Internet Edge architecture, called DeepEdge, for handling Deep Learning workloads on a network edge. It leverages insights about the structure of Deep Neural Networks (DNN) to schedule tasks in a way that can achieve good performance for small workloads, and gracefully degrades when the workload increases

- **HackerRank** Bangalore, India
  Software Engineering Intern *May 2015 - Aug 2015*
  - **Code Checker**: HackerRank organizes various online programming contests and Codechecker is the module which makes sure that each submitted solution passes the required test cases meanwhile following the specified resource constraints. As part of my work I improved the Codechecker by adding support for Image Processing related problems. My other work as a intern led to ten fold reduction in deployment time by improvising the asset pre-compilation pipeline.
  - **Static Code Analysis**: As part of the internal hackathon organized by the company, developed a static code analysis tool which is currently under development to be offered as a service to end-users
- **IIIT Hyderabad** Hyderabad, India
  Research assistant *May 2013 - Aug 2016*
  - **Automated top view registration of broadcast football videos**: Developed a system for automatic registration of a broadcast soccer frame to its corresponding top view. For the task of image registration we propose an alternate approach exploiting the edge information and demonstrate its success in a specific scenario of registering football broadcast video frames on the static top view model of the playing surface
  - **Automatic analysis of broadcast football videos using contextual priors**: Demonstrated that contextual information can be harnessed for automatic analysis of sports videos. Here the proposed algorithm allows us to extract salient events such as Goal, Foul, Corner, Substitution etc. automatically from a given broadcast soccer video.
  - **Fine Grain Annotation of Cricket Videos**: Presented a solution that enables rich semantic annotation of Cricket videos at a fine temporal scale. Our approach circumvents technical challenges in visual recognition by utilizing information from online text-commentaries. We obtain a high annotation accuracy, as evaluated over a large video collection.
  - **Event Recognition in Broadcast Soccer Videos**: Proposed an approach for soccer event recognition using deep convolutional features combined with domain-specific cues. This approach uses deep convolution feature (TDD) in combination with our proposed algorithm of Automated top view registration to improve upon the task of Event recognition.
- **IIIT Hyderabad** Hyderabad, India
  Teaching assistant
  - Artificial Intelligence
  - Principle of Programming Languages
  - Digital Image Processing
  - Digital Signal Analysis and Applications

Achievements

- Made into Deans list of Academic and Research excellence at IIIT Hyderabad
- Won outstanding technical achievement award for our project FarmBeats as part of Microsoft AI School
- Winner of IIIT-H Hackathon
- Division 1 Coder at CodeForces with rating of 1745.
- Ranked 16th(All India Rank) at Hacker Earth Inter University Programming Contest
- Finished in Top Ranks at Various Programming Contests in inter-college level competitions
- Elected member of Academic Council Student affairs committee (AC-SAC)
- Research Work on "Fine-Grain Annotation of Cricket Videos" covered by Washington Post ,NDTV, theregister and others such as thestack and slashdot

References

- Ranveer Chandra, Principal Researcher (Microsoft Research, Redmond)
- Praneeth Netrapalli, Researcher (Microsoft Research, India)
- Prof. C.V. Jawahar, Professor (IIIT Hyderabad, India)
- Vineet Gandhi, Assistant Professor (IIIT Hyderabad, India)
- Visesh Chari, Research Scientist (Amazon Lab 126, San Francisco)