

# UTSAV DROLIA

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CONTACT INFORMATION	RMCIC, Carnegie Mellon University 4720 Forbes Avenue, #410 Pittsburgh, PA 15213, USA	<i>Mobile:</i> +1 (936) 697-2461 <i>E-mail:</i> utsav@cmu.edu <i>Web:</i> andrew.cmu.edu/user/udrolia/
OBJECTIVE	Seeking a full-time research position in the field of large-scale distributed and mobile systems.	
RESEARCH INTERESTS	Mobile and edge computing, application-specific design, distributed systems, visual computing <i>Focus of recent projects:</i> Accelerating mobile recognition applications through edge computing	
EDUCATION	<b>Carnegie Mellon University</b> Ph.D., Electrical and Computer Engineering – Advisor: Prof. Priya Narasimhan	Pittsburgh, PA Jul 2012 - present
	<b>University of Pennsylvania</b> M.S., Embedded Systems	Philadelphia, PA Sep 2010 - May 2012
	<b>Manipal Institute of Technology</b> B.Eng, Electronics and Communication Engineering	Manipal, India Aug 2006 - May 2010
RESEARCH AND INDUSTRY EXPERIENCE	<b>Carnegie Mellon University</b> <i>Graduate Researcher, Electrical and Computer Engineering</i> – Reduced latency for cloud-based mobile recognition applications through distributed caching of trained models across devices and edge-servers – Enabled data discovery and sharing across nearby mobile devices by creating a key-value store distributed across the devices themselves – Tackled retail inventory issues such as planograms and item counts using computer vision on a UAV with a cooperating ground robot – Enabled low-cost road monitoring through a vehicle-mounted remote sensing platform and crowdsensing-based aggregators and filters	Pittsburgh, PA Jul 2012 - present
	<b>Nokia Bell Labs</b> <i>Research Intern</i> – Researched bottlenecks in cloud-based mobile image recognition applications – Reduced latency and bandwidth consumption for image recognition applications by using edge servers as caches	Murray Hill, USA May 2016 - Jul 2016
	<b>YinzCam Inc.</b> <i>Research Intern</i> – Researched multiple wireless protocols for device-to-device communication – Developed system for efficient device-to-device data dissemination across proximal mobile devices to reduce stress on wireless infrastructure	Pittsburgh, PA Jun 2014 - Dec 2014
	<b>General Motors Collaborative Research Lab, CMU</b> <i>Research Intern</i> – Extended FlexRay network testbed with prototype FlexRay star-switches – Analyzed faults in FlexRay testbed through fault-injection experiments – Diagnosed faults in FlexRay networks using a machine learning approach	Pittsburgh, PA Jan 2012 - Aug 2012
	<b>Real Time Embedded Systems Lab, University of Pennsylvania</b> <i>Research Assistant</i> – Developed a test bed consisting of RTOS-enabled ECUs for online verification of ECU software – Researched the feasibility of using Embedded Virtual Machines for ECUs in automotives – Developed a Matlab test-harness to place faulty code in ECUs and monitor the faults effects	Philadelphia, PA Jan 2011 - Dec 2011
	<b>Honeywell Technology Solutions Lab</b> <i>Intern</i> – Developed tools for automated signal and message verification on the communication buses on the Airbus A350 XWB – Created a user-friendly GUI for the signal verification toolset – Automated the generation of control flow and data flow diagrams from application source code	Bangalore, India Jan 2010 - May 2010

## PUBLICATIONS

1. “*Cachier: Edge-caching for recognition applications*”, Utsav Drolia, Katherine Guo, Jiaqi Tan, Rajeev Gandhi, & Priya Narasimhan, IEEE International Conference on Distributed Computing Systems (ICDCS’17), June 2017.
2. “*Towards edge-caching for image recognition*”, Utsav Drolia, Katherine Guo, Jiaqi Tan, Rajeev Gandhi, & Priya Narasimhan, IEEE International Workshop on Smart Edge Computing and Networking (SmartEdge’17), March 2017.
3. “*PCFIRE: towards provable preventative control-flow integrity enforcement for realistic embedded software*”, Jiaqi Tan, Hui Jun Tay, Utsav Drolia, Rajeev Gandhi, & Priya Narasimhan, ACM International Conference on Embedded Software (EmSoft’16), October 2016.
4. “*Poster: Approximate Memoization for Perception-based Mobile Applications*”, Utsav Drolia, Katherine Guo, Jiaqi Tan, Rajeev Gandhi, & Priya Narasimhan, ACM International Conference on Mobile Systems, Applications, and Services (MobiSys’16), June 2016.
5. “*Zephyr: First-person wireless analytics from high-density in-stadium deployments*”, Nathan Mickulicz, Utsav Drolia, Rajeev Gandhi, & Priya Narasimhan, IEEE International Symposium on World of Wireless, Mobile and Multimedia Networks (WoWMoM’16), June 2016.
6. “*The next-generation in-stadium experience (keynote)*”, Priya Narasimhan, Utsav Drolia, Jiaqi Tan, Nathan Mickulicz, & Rajeev Gandhi, ACM SIGPLAN International Conference on Generative Programming: Concepts and Experiences (GPCE’15), October 2015.
7. “*Krowd: A Key-Value Store for Crowded Venues*”, Utsav Drolia, Nathan Mickulicz, Rajeev Gandhi, & Priya Narasimhan, ACM International Workshop on Mobility in the Evolving Internet Architecture (MobiArch’15), September 2015. (*Best paper award*)
8. “*STOVEPipe: Observable Access Control of User Data for Untrusted Applications on Mobile Devices*”, Jiaqi Tan, Utsav Drolia, Rolando Martins, Rajeev Gandhi, & Priya Narasimhan, IEEE International Conference on Cloud Computing Technology and Science (CloudCom’14), December 2014.
9. “*Short Paper: CHIPS: Content-based Heuristics for Improving Photo Privacy for Smartphones*”, Jiaqi Tan, Utsav Drolia, Rolando Martins, Rajeev Gandhi, & Priya Narasimhan, ACM Conference on Security and Privacy in Wireless and Mobile Networks (WiSec’14), July 2014.
10. “*The Case for Mobile Edge-Clouds*”, Utsav Drolia, Rolando Martins, Jiaqi Tan, Ankit Chheda, Monil Sanghavi, Rajeev Gandhi, & Priya Narasimhan, IEEE International Conference on Ubiquitous Intelligence and Computing (UIC’13), December 2013.
11. “*MetaBot: Automated and dynamically schedulable robotic behaviors in retail environments*”, Jon Francis, Utsav Drolia, Kunal Mankodiya, Rolando Martins, Rajeev Gandhi, & Priya Narasimhan, IEEE International Symposium on Robotic and Sensors Environments (ROSE’13), October 2013.
12. “*Panoptes: Crowd-sourced Cars with a Cause*”, Utsav Drolia, Kunal Mankodiya, Nathan Mickulicz, & Priya Narasimhan, IEEE/ACM International Conference on Connected Vehicles and Expo (ICCVE’12), December 2012.
13. “*Diagnostic Fusion for Time-Triggered Automotive Networks*”, Utsav Drolia, Soila Kavulya, Kunal Mankodiya, Priya Narasimhan & Thomas E. Fuhrman, High-Assurance Systems Engineering (HASE’12), October 2012.
14. “*AutoPlug: An Automotive Test-bed for Electronic Controller Unit Testing and Verification*”, Utsav Drolia, Zhenyan Wang, Yash Pant and Rahul Mangharam, IEEE International Conference on Intelligent Transportation Systems (ITS’11), October 2011.

## PAPERS UNDER SUBMISSION

1. “*PreCog: Prefetching for Image Recognition Applications at the Edge*” Utsav Drolia, Katherine Guo, & Priya Narasimhan, ACM/IEEE Symposium on Edge Computing (SEC’17), October 2017.

## TECHNICAL SKILLS

*Programming Languages:* Python, Java, C++, C  
*Tools/Libraries:* L<sup>A</sup>T<sub>E</sub>X, MATLAB, Git, OpenCV, ZeroMQ  
*Operating Systems:* Linux, Android, OS X

PRESENTATIONS AND TALKS	<ol style="list-style-type: none"> <li>1. “Towards edge-caching for image recognition” @ IEEE International Workshop on Smart Edge Computing and Networking, March 2017.</li> <li>2. “Edge-caching for mobile augmented reality” @ Nokia Bell Labs - Interns Seminar, July 2016.</li> <li>3. “Krowd: A Key-Value Store for Crowded Venues” @ ACM International Workshop on Mobility in the Evolving Internet Architecture, September 2015.</li> <li>4. “The Case for Mobile Edge-Clouds” @ IEEE International Conference on Ubiquitous Intelligence and Computing, December 2013.</li> <li>5. “Hyrax: Edge Clouds of Mobile Devices” @ Parallel Data Laboratory Retreat, October 2013.</li> <li>6. “Panoptes: Crowd-sourced Cars with a Cause” @ IEEE/ACM International Conference on Connected Vehicles and Expo, December 2012.</li> <li>7. “FlexRay Diagnostics and Prognostics” @ General Motors Collaborative Research Lab Retreat, November 2012.</li> <li>8. “Diagnostic Fusion for Time-Triggered Automotive Networks” @ High-Assurance Systems Engineering, October 2012.</li> <li>9. “AutoPlug: An Automotive Test-bed for Electronic Controller Unit Testing and Verification” @ IEEE International Conference on Intelligent Transportation Systems, October 2011.</li> </ol>
TEACHING EXPERIENCE	<p><b>Carnegie Mellon University</b>, Pittsburgh, PA</p> <ul style="list-style-type: none"> <li>– <i>Teaching Assistant</i> - 18749 – Building Reliable Distributed Systems      Fall 2015, 2016</li> <li>– <i>Teaching Assistant</i> - 18842 – Distributed Systems      Spring 2015</li> </ul>
MENTORING EXPERIENCE	<ul style="list-style-type: none"> <li>– Monil Shah, Graduate Student (MS), CMU      Summer 2015</li> <li>– Sairam Krishnan, Undergraduate Senior, CMU      Fall 2014</li> <li>– Ankit Chheda, Graduate Student (MS) , CMU      Summer 2013</li> <li>– Torstein Strømme, Undergraduate Senior, CMU      Fall 2012</li> </ul>
AWARDS & HONORS	<ul style="list-style-type: none"> <li>– NSF travel grant at IEEE PerCom      Mar 2017</li> <li>– NSF travel grant at Symposium on Edge Computing      Oct 2016</li> <li>– Best paper award at MobiArch      Sep 2015</li> <li>– Deans Tuition Fellowship, Carnegie Institute of Technology      Fall 2012</li> <li>– Best paper presentation, <i>VI Mantra</i> organized by National Instruments      Nov 2009</li> <li>– Winner, Autonomous Robotics, <i>Techtatva</i> '09      Oct 2009</li> <li>– Winner, Controlled Robotics, <i>Techtatva</i> '06      Sep 2006</li> </ul>
SERVICES AND VOLUNTEER ACTIVITIES	<p><b>Program Committee Member</b></p> <ul style="list-style-type: none"> <li>– Workshop on Middleware for Edge Clouds &amp; Cloudlets @ Middleware '16      Dec 2016</li> </ul> <p><b>Board Member</b>, Indian Graduate Student Association, CMU      Jun 2014 - Sep 2016</p> <ul style="list-style-type: none"> <li>– Vice President      Jun 2015 - Sep 2015</li> <li>– Treasurer      Jun 2014 - Jun 2015</li> </ul> <p><b>Event Coordinator</b></p> <ul style="list-style-type: none"> <li>– Revels, the annual cultural festival of Manipal Institute of Technology      Mar 2009</li> <li>– TechTatva, the annual technical festival of Manipal Institute of Technology      Oct 2008</li> </ul>