Prateek Sharma

Contact Information

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Research Interests

- I am a systems researcher with broad interests in large scale systems, cloud computing, and data processing.

Education

- **University of Massachusetts Amherst** — Sept 2013 - Aug 2018 (expected)
  Ph.D. Candidate in Computer Science — *Advisor: Prof. Prashant Shenoy*

- **Indian Institute of Technology - Bombay** — July 2009 - July 2012
  M.Tech. in Computer Science — *Advisor: Prof. Purushottam Kulkarni*

- **Birla Institute of Technology and Science - Pilani** — July 2005 - June 2009
  M.Sc.(Tech.) in Information Systems

Publications

1. **Prateek Sharma**, Stephen Lee, Tian Guo, David Irwin, and Prashant Shenoy. Managing Risk in a Derivative IaaS Cloud. *IEEE Transactions on Parallel and Distributed Systems*, (To Appear), 2017.

2. Lucas Chaufournier, **Prateek Sharma**, Franck Le, Erich Nahum, Prashant Shenoy, and Don Towsley. Fast transparent virtual machine migration in distributed edge clouds. In *Proceedings of the second IEEE/ACM Symposium on Edge Computing*, pages 1–12, October 2017.

3. **Prateek Sharma**, Patrick Pegus II, David Irwin, Prashant Shenoy, John Goodhue, and James Culbert. Design and Operational Analysis of a Green Data Center. *IEEE Internet Computing. Special Issue on Energy-Efficient Data Centers*, 21(4):16–24, July/August 2017

4. **Prateek Sharma**, David Irwin, and Prashant Shenoy. Portfolio-driven Resource Management for Transient Cloud Servers. In *Proceedings of ACM on Measurement and Analysis of Computing Systems (SIGMETRICS)*, volume 1, pages 5:1–5:23. ACM, June 2017

5. **Prateek Sharma**, David Irwin, and Prashant Shenoy. Keep It Simple: Bidding for Servers in Today's Cloud Platforms. *IEEE Internet Computing*, 21(3):88–92, May/June 2017

6. David Irwin, **Prateek Sharma**, Supreeth Shastri, and Prashant Shenoy. The Financialization of Cloud Computing: Opportunities and Challenges. In *2017 26th International Conference on Computer Communication and Networks*, pages 1–11, July 2017 (Invited Paper)

7. **Prateek Sharma**, Lucas Chaufournier, Prashant Shenoy, and Y. C. Tay. Containers and Virtual Machines at Scale: A Comparative Study. In *Proceedings of the 17th International Middleware Conference*, pages 1:1–1:13. ACM, 2016. Acceptance rate = 19%

8. **Prateek Sharma**, David Irwin, and Prashant Shenoy. How Not to Bid the Cloud. In *Proceedings of the 8th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud)*. USENIX, June 2016. Acceptance rate = 31%

9   **Prateek Sharma**, Tian Guo, Xin He, David Irwin, and Prashant Shenoy. Flint: Batch-Interactive Data-Intensive Processing on Transient Servers. In *Proceedings of the Eleventh European Conference on Computer Systems (EuroSys)*, pages 6:1–6:15. ACM, 2016. Acceptance rate = 21%

10 **Prateek Sharma**, Purushottam Kulkarni, and Prashant Shenoy. Per-VM Page Cache Partitioning for Cloud Computing Platforms. In *2016 8th International Conference on Communication Systems and Networks (COMSNETS)*, pages 1–8, Jan 2016. Acceptance rate = 27%

11 Supreeth Subramanya, Tian Guo, **Prateek Sharma**, David Irwin, and Prashant Shenoy. SpotOn: A Batch Computing Service for the Spot Market. In *Proceedings of the Sixth ACM Symposium on Cloud Computing (SoCC)*, pages 329–341. ACM, 2015. Acceptance rate = 22%

12 **Prateek Sharma**, Stephen Lee, Tian Guo, David Irwin, and Prashant Shenoy. Spotcheck: Designing a Derivative IaaS Cloud on the Spot Market. In *Proceedings of the Tenth European Conference on Computer Systems (EuroSys)*, pages 16:1–16:15. ACM, 2015. Acceptance rate = 21%

13 Rahul Singh, **Prateek Sharma**, David Irwin, Prashant Shenoy, and K.K. Ramakrishnan. Here Today, Gone Tomorrow: Exploiting Transient Servers in Data Centers. *IEEE Internet Computing*, 18(4), July/August 2014

14 **Prateek Sharma** and Purushottam Kulkarni. Singleton: System-wide Page Deduplication in Virtual Environments. In *Proceedings of the 21st international symposium on High-Performance Parallel and Distributed Computing (HPDC)*, pages 15–26. ACM, 2012. Acceptance rate = 16%

15 Praveen Ranjan Srivastava, Vinod Ramachandran, Manish Kumar, Gourab Talukder, Vivek Tiwari, and **Prateek Sharma**. Generation of Test Data Using Meta Heuristic Approach. In *TENCON IEEE Region 10 Conference*, pages 1–6, Nov 2008

16 **Prateek Sharma**, Ahmed Ali-Eldin, and Prashant Shenoy. Resource Deflation: A New Abstraction For Transient Computing. (Under Review)

Patents

1   Karthik Nagesh, Ullas B Nambiar, **Prateek Sharma**, and Niranjan Thirumale. Management of computing system element migration. Patent Number: US 09697266. Grant Date: July 2017

Research Experience

- **University of Massachusetts Amherst**
  Advisor: Prof. Prashant Shenoy

  - Thesis on "Transiency-driven Resource Management for Cloud Computing Platforms".
  - Designed policies, mechanisms, and systems for resource management and fault-tolerance, for transiently available (rather than continuously available) computational resources.
  - Explored the role and effectiveness of hardware and operating system virtualization.
  - Investigated the role of multi-path networking for migrating application state in edge clouds, and to improve data center application performance.

- **Indian Institute of Technology Bombay**
  Advisor: Prof. Purushottam Kulkarni

  - As part of my masters thesis, investigated memory management in virtualized environments.
  - Designed and implemented memory overcommitment techniques for Linux and KVM.

Work Experience

VMWare Performance Engineering — June - Aug 2017
Intern. Mentors: Reza Taheri and Tariq Magdon-Ismail — *Palo Alto, CA*
– Research project on detecting performance anomalies in ESX VMs with unsupervised machine learning.

Microsoft Research — May - Aug. 2014
Intern. Mentor: Sriram Rao — *Mountain View, CA*
– Erasure coding for intermediate map-reduce data in hadoop file systems.

EMC Data Storage Systems — Aug 2012 - May 2013
Software Engineer, R&D Team — *Bangalore, India*
– Worked broadly in the areas of cloud computing and big-data analytics.

Dept. of Computer Science & Engineering - IIT Bombay — July 2009 - July 2012
System Administrator — *Mumbai, India*
– Maintained department-wide computing facilities, and set up the virtualization infrastructure.

IBM India Software Lab — July 2008 - Dec. 2008
Intern. Implemented Eclipse plugins for business report generation. — *Pune, India*

The Tata Power Company — May 2007 - July 2007
Summer Intern — *Mumbai, India*

Teaching Experience

All teaching experience at the University of Massachusetts Amherst

Teaching Assistant, CS677: Distributed Operating Systems — Spring 2015
Helped design assignments, and graded student work.

Teaching Assistant, CS377: Operating Systems — Spring 2014
Taught discussions and tutorials, and graded student work.

Teaching Assistant, CS311: Introduction to Algorithms — Fall 2013
Taught discussions and tutorials, and graded student work.

- Guest lectured in six different classes:

    – "Linux kernel design", Operating Systems. Spring 2014, Fall 2015, Fall 2016.

    – "System Administration", Introduction to UNIX & Linux. Fall 2015

    – "Cloud Computing", Distributed Operating Systems. Spring 2016.

    – "Remote Procedure Calls", Distributed Operating Systems. Fall 2016.

Service

- **Shadow program committee member**: EuroSys 2016, EuroSys 2017, and ASPLOS 2018

- **External reviewer**: ACM Transactions on Networking, Elsevier Future Generation Computer Systems, IEEE Internet Computing

Awards

- Travel grant recipient: HPDC 2012, EuroSys 2015, EuroSys 2016, COMSNETS 2016, Middleware 2016, SIGMETRICS 2017

References

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