

Anshul Gandhi
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Research Interests

- Performance analysis and power management in server farms.

Education

- **Carnegie Mellon University** (2007-Present)
Ph.D. Student, Computer Science Department (Expected Summer 2012) Pittsburgh, PA, USA
Advisor: Prof. Mor Harchol-Balter
- **Indian Institute of Technology, Kanpur** (2003-2007)
B.Tech, Computer Science and Engineering Kanpur, UP, India
CGPA: 9.7/10.0 (3.9/4.0)
Departmental Rank: 1

Work Experience

- **HP Labs** (Summer 2010)
Summer Intern Palo Alto, CA, USA
Hosts: Yuan Chen and Cullen Bash
We designed and implemented a hybrid server provisioning solution that employs novel prediction techniques for proactive server provisioning and then leverages a reactive controller to service any excess noise in the demand. Implementation results on a 10 server test bed indicate that our hybrid provisioning solution can achieve response time goals without wasting too much energy and can also avoid frequent power cycling of servers.
- **Intel Research Pittsburgh** (Summer 2009)
Summer Intern Pittsburgh, PA, USA
Hosts: Mike Kozuch and Jason Campbell
We analyzed and implemented dynamic power management algorithms for multi-server systems. We characterized the regimes under which low-power states, such as idle, off or sleep, are useful. Important variables included load, variability of job service demands, setup costs, number of servers etc.
- **IBM T.J. Watson Research Center** (Summer 2008)
Summer Intern Hawthorne, NY, USA
Hosts: Rajarshi Das and Jeff Kephart
We investigated algorithms for optimally allocating available power to multi-server systems so as to minimize response times. Our implementation showed an improvement in response time by a factor of 5, when compared to existing naive power allocation algorithms.
- **Institute of Theoretical Computer Science, ETH** (Summer 2006)
Summer Intern Zurich, Switzerland
Hosts: Uli Wagner and Emo Welzl

Publications

- **Distributed, Robust Auto-Scaling Policies for Power Management in Compute Intensive Server Farms**
Anshul Gandhi, Mor Harchol-Balter, Ram Raghunathan and Mike Kozuch.
Under Review, *USENIX ATC*, 2011.
- **A Hybrid Approach for Server Provisioning in Data Centers**
Anshul Gandhi, Yuan Chen, Daniel Gmach, Martin Arlitt and Manish Marwah.
Under Review, *USENIX ATC*, 2011.
- **Optimality Analysis of Energy-Performance Trade-off for Server Farm Management**
Anshul Gandhi, Varun Gupta, Mor Harchol-Balter and Mike Kozuch.
Performance Evaluation, Vol. 67, Issue 11, pp. 1155-1171.
- **Server Farms with Setup Costs**
Anshul Gandhi, Mor Harchol-Balter and Ivo Adan.
Performance Evaluation, Vol. 67, Issue 11, pp. 1123-1138.
- **Decomposition Results for an M/M/k with Staggered Setup**
Anshul Gandhi, Mor Harchol-Balter and Ivo Adan.
Performance Evaluation Review, Vol. 38, Issue 2, pp. 48-50.
- **M/G/k with Exponential Setup**
Anshul Gandhi, Mor Harchol-Balter and Ivo Adan.
Madrid Conference on Queueing Theory, Madrid, Spain, June 2010.
- **Optimal Power Allocation in Server Farms**
Anshul Gandhi, Mor Harchol-Balter, Rajarshi Das, and Charles Lefurgy.
SIGMETRICS/Performance, Seattle, WA, USA, June 2009.
- **Power Capping Via Forced Idleness**
Anshul Gandhi, Mor Harchol-Balter, Rajarshi Das, Jeffrey Kephart and Charles Lefurgy.
Workshop on Energy-Efficient Design, Austin, TX, USA, June 2009.
- **Inducing Optimal Scheduling with Selfish Users**
Laurens Debo, Paul Enders, Anshul Gandhi, Varun Gupta, Mor Harchol-Balter and Alan Scheller-Wolf.
Under Revision for 2nd Review at *Management Science*.
- **Database Summarization and Publishing in Wireless Environments**
Anshul Gandhi and R.K.Ghosh.
International Conference on Distributed Computer Networking, Guwahati, India, December 2006.

Academic Honors

- Nominated by CMU for the IBM Fellowship, 2011.
- Winner of the CMU Cross Campus New Venture Competition, 2011.
- Awarded the Kauffman Foundation Commercialization prize, 2010.
- Awarded the Intel/CMU Summer Fellowship, 2009.
- Authored one full patent and two provisional patents.
- Awarded the General Proficiency Medal for Best Academic Performance in the Department of Computer Science and Engineering (IIT Kanpur).
- Awarded the Proficiency Medal for the Best Project Work (Indecomposable Graphs) in the Department of Computer Science and Engineering (IIT Kanpur).
- Awarded the Pratibha Scholarship from the state government for academic excellence (IIT Kanpur).