

# Jeffrey A. Pang

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## SUMMARY

I'm currently a Software Engineer at Databricks. I've previously built software systems and conducted fundamental technical research on large-scale network analytics, Wi-Fi, wireless security, and distributed systems for network games. My technical research has been published in 35 conferences, workshops, journals, and patents, I've received the Best Paper Award at ACM MobiSys, and I've received AT&T's Key Contributor Award. I've been on the technical program committee of 12 conferences and workshops about mobile computing and computer networks, I've chaired 2, and I've mentored 8 interns. I have a Ph.D. in Computer Science from Carnegie Mellon University and a B.A. in Computer Science from the University of California, Berkeley, where I graduated first in my major.

## EDUCATION

- 2003 – 2009      **Ph.D. in Computer Science, Carnegie Mellon University**
- Thesis Topic: Quantifying and Mitigating Privacy Threats in Wireless Protocols
  - Advisor: Prof. Srinivasan Seshan
- M.S. in Computer Science, Carnegie Mellon University**
- 1999 – 2003      **B.A. in Computer Science with Highest Honors, UC Berkeley**
- Highest Achievement Award in Computer Science (1st in major)

## PROFESSIONAL EXPERIENCE

- 2014 – Present      **Software Engineer**  
**Databricks, Berkeley, CA**
- 2009 – 2014      **Senior Member of Technical Staff – Research**  
**AT&T Labs, Bedminster, NJ / San Francisco, CA**
- 2003 – 2009      **Graduate Research Assistant**  
**Carnegie Mellon University, Pittsburgh, PA**
- 2008, 2007      **Research Intern**  
**Intel Research, Seattle, WA**
- 2006      **Research Intern**  
**Microsoft Research, Redmond, WA**
- 2005      **Research Intern**  
**Intel Research, Pittsburgh, PA**
- 2002 – 2003      **Undergraduate Research Assistant**  
**U.C. Berkeley, Berkeley, CA**
- 2001 – 2002      **Software Engineering Intern**  
**Sun Microsystems, Oakland, CA**

## PROFESSIONAL ACTIVITIES

- **General Chair:**
  - 2014:** All Things Cellular Workshop (at ACM SIGCOMM)
  - 2010:** ACM Mobisys PhD Forum
- **Technical Program Committee:**
  - 2014:** ACM MobiSys
  - 2013:** ACM Internet Measurement Conference
  - 2012:** ACM MobiSys, PAM, COMSNETS, ACM MobiGames, CoNext Student Workshop
  - 2011:** ACM MobiHeld, ACM/IEEE NetGames
  - 2010:** ICPP, USENIX INM/WREN

## TEACHING AND MENTORING

- **Mentoring at AT&T Labs:**
  - Athula Balachandran, Intern, 2013 (Ph.D candidate, Carnegie Mellon University)
  - Sanae Rosen, Intern, 2013-2014 (Ph.D candidate, University of Michigan)
  - Xuan Bao, Intern, 2012 (Staff Software Engineer, Samsung Research America)
  - Aaron Gember, Intern/Collaborator, 2011-2012 (Ph.D. candidate, University of Wisconsin - Madison)
  - Umar Javed, Collaborator, 2011 (Ph.D. candidate, University of Washington)
  - Zubair Shafiq, Intern/Collaborator, 2011-2013 (Assistant Professor, University of Iowa)
  - Qiang Xu, Intern/Collaborator, 2010-2011 (Researcher, NEC Labs America)
  - Virajith Jalaparti, Intern, 2010 (Ph.D. candidate, University of Illinois at Urbana-Champaign)
- **Mentoring at Carnegie Mellon University:**
  - Xinyu Zhang, Masters Student, 2007
- **Teaching Assistant:**
  - Graduate Computer Networks (15-744), Carnegie Mellon University, 2007
  - Computer Networks (15-441), Carnegie Mellon University, 2004

## SELECTED AWARDS AND HONORS

- **AT&T Key Contributor Award**, 2012
- **Best Paper Award:** MobiSys, 2008
- **Highest Achievement Award in Computer Science:** U.C. Berkeley, 2003
- **Upsilon Pi Epsilon:** U.C. Berkeley, 2001

## SELECTED TECHNICAL SKILLS

- **Extensive Experience:** C/C++, Java, Perl
- **Recent Experience:** Scala, Python, R, Javascript, Android, Hadoop, Pig, Spark, Linux administration
- **Previous Experience:** SQL, HTML/CSS, Lisp, OCaml, x86 assembly, Linux kernel modules, Solaris, etc.
- **Standards and Protocols:** TCP/IP, UDP, 802.11, UMTS, LTE, DNS, HTTP, etc.

## PUBLICATIONS

### Refereed Conference Publications

1. **Modeling Web Quality-of-Experience on Cellular Networks.** Athula Balachandran, Vaneet Aggarwal, Emir Halepovic, Jeffrey Pang, Srinivasan Seshan, Shobha Venkataraman, He Yan. *ACM International Conference on Mobile Computing and Networking (MobiCom)*, 2014, Maui, Hawaii. To appear. [16% acceptance rate]
2. **Understanding the Impact of Network Dynamics on Mobile Video User Engagement.** M. Zubair Shafiq, Jeffrey Erman, Lusheng Ji, Alex X. Liu, Jeffrey Pang, Jia Wang. *ACM SIGMETRICS/Performance*, 2014, Austin, TX. [17% acceptance rate]
3. **A First Look at Cellular Network Performance during Crowded Events.** Zubair Shafiq, Lusheng Ji, Alex Liu, Jeffrey Pang, Shobha Venkataraman, Jia Wang. In *ACM SIGMETRICS/Performance*, 2013, Pittsburgh, PA. [15% acceptance rate]
4. **Modeling Cellular User Mobility using a Leap Graph.** Wei Dong, Nicholas Duffield, Zihui Ge, Seungjoon Lee, Jeffrey Pang. In *Passive and Active Measurement Conference (PAM)*, 2013, Hong Kong, China. [32% acceptance rate]
5. **Can you GET me now? Estimating the Time-to-First-Byte of HTTP transactions with Passive Measurements.** Emir Halepovic, Jeffrey Pang, Oliver Spatscheck. In *ACM/USENIX Internet Measurement Conference (IMC)*, 2012, Boston, MA. [25% acceptance rate]
6. **Obtaining In-context Measurements of Cellular Network Performance.** Aaron Gember, Aditya Akella, Ramon Caceres, Jeffrey Pang, Alexander Varshavsky. In *ACM/USENIX Internet Measurement Conference (IMC)*, 2012, Boston, MA. [25% acceptance rate]
7. **A First Look at Cellular Machine-to-Machine Traffic – Large Scale Measurement and Characterization.** Zubair Shafiq, Lusheng Ji, Alex Liu, Jeffrey Pang, Jia Wang. In *ACM SIGMETRICS/Performance*, 2012, London, UK. To appear. [15% acceptance rate]
8. **Characterizing Geospatial Dynamics of Application Usage in a 3G Cellular Data Network.** Zubair Shafiq, Lusheng Ji, Alex Liu, Jeffrey Pang, Jia Wang. In *IEEE International Conference on Computer Communications (INFOCOM)*, 2012, Orlando, FL. [18% acceptance rate]
9. **Identifying Diverse Usage Behaviors of Smartphone Apps.** Qiang Xu, Jeffrey Erman, Alexandre Gerber, Z. Morley Mao, Jeffrey Pang, Shobha Venkataraman. In *ACM/USENIX Internet Measurement Conference (IMC)*, 2011, Berlin, Germany. [19% acceptance rate]
10. **AccuLoc: Practical Localization of Performance Measurements in 3G Networks.** Qiang Xu, Alexandre Gerber, Z. Morley Mao, Jeffrey Pang. In *ACM International Conference on Mobile Systems, Applications, and Services (MobiSys)*, 2011, Washington, D.C. [18% acceptance rate]
11. **Internet-scale Visualization and Detection of Performance Events.** Jeffrey Pang, Subhabrata Sen, Oliver Spatscheck, Shobha Venkataraman. In *USENIX Annual Technical Conference*, 2011, Portland, OR. [20% acceptance rate]
12. **Speed Testing without Speed Tests: Estimating Achievable Download Speed from Passive Measurements.** Alexandre Gerber, Jeffrey Pang, Oliver Spatscheck, Shobha Venkataraman. In *ACM/USENIX Internet Measurement Conference (IMC)*, 2010, Melbourne, Australia. [22% acceptance rate]
13. **Wifi-Reports: Improving Wireless Network Selection with Collaboration.** Jeffrey Pang, Ben Greenstein, Michael Kaminsky, Damon McCoy, Srinivasan Seshan. In *ACM International Conference on Mobile Systems, Applications, and Services (MobiSys)*, 2009, Kraków, Poland. [20% acceptance rate]
14. **Donnybrook: Enabling Large-Scale, High-Speed, Peer-to-Peer Games.** Ashwin Barambe, John R. Douceur, Jacob R. Lorch, Thomas Moscibroda, Jeffrey Pang, Srinivasan Seshan, Xinyu Zhuang. In *ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, 2008, Seattle, WA. [12% acceptance rate]
15. **Improving Wireless Privacy with an Identifier-Free Link Layer Protocol.** Ben Greenstein, Damon

McCoy, Jeffrey Pang, Tadayoshi Kohno, Srinivasan Seshan, and David Wetherall. In *ACM International Conference on Mobile Systems, Applications, and Services (MobiSys)*, 2008, Breckenridge, CO. **Best Paper Award**. [18% acceptance rate]

16. **802.11 User Fingerprinting**. Jeffrey Pang, Ben Greenstein, Ramakrishna Gummadi, Srinivasan Seshan, and David Wetherall. In *ACM International Conference on Mobile Computing and Networking (MobiCom)*, 2007, Montreal, QC, Canada. [11% acceptance rate]
17. **Defragmenting DHT-based Distributed File Systems**. Jeffrey Pang, Phillip B. Gibbons, Michael Kaminsky, Srinivasan Seshan, Haifeng Yu. In *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2007, Toronto, ON, Canada. [14% acceptance rate]
18. **Colyseus: A Distributed Architecture for Interactive Multiplayer Games**. Ashwin Bharambe, Jeffrey Pang, and Srinivasan Seshan. In *USENIX Symposium on Network Design and Implementation (NSDI)*, 2006, San Jose, CA. [25% acceptance rate]
19. **Availability, Usage, and Deployment Characteristics of the Domain Name System**. Jeffrey Pang, James Hendricks, Aditya Akella, Bruce Maggs, Roberto De Prisco and Srinivasan Seshan. In *ACM/USENIX Internet Measurement Conference (IMC)*, 2004, Taormina, Sicily, Italy. [25% acceptance rate]
20. **On the Responsiveness of DNS-based Network Control**. Jeffrey Pang, Aditya Akella, Anees Shaikh, Balachander Krishnamurthy and Srinivasan Seshan. In *ACM/USENIX Internet Measurement Conference (IMC)*, 2004, Taormina, Sicily, Italy. [25% acceptance rate]
21. **Overlay Routing vs Multihoming: An End-to-End Perspective**. Aditya Akella, Jeffrey Pang, Bruce Maggs, Srinivasan Seshan and Anees Shaikh. In *ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication (SIGCOMM)*, 2004, Portland, OR. [9% acceptance rate]

#### Refereed Journal Publications

22. **Large Scale Measurement and Characterization of Machine-to-Machine Traffic**. Zubair Shafiq, Lusheng Ji, Alex Liu, Jeffrey Pang, Jia Wang. In *IEEE/ACM Transactions on Networking (ToN)*, 2013.
23. **Wifi-Reports: Improving Wireless Network Selection with Collaboration**. Jeffrey Pang, Ben Greenstein, Michael Kaminsky, Damon McCoy, Srinivasan Seshan. In *IEEE Transactions on Mobile Computing (TMC)*, 2010, vol 9, num 12, pp 1713-1731.

#### Refereed Workshop Publications

24. **Prometheus: Toward Quality-of-Experience Estimation for Mobile Apps from Passive Network Measurements**. Vaneet Aggarwal, Emir Halepovic, Jeffrey Pang, Shobha Venkataraman, He Yan. *5th Workshop on Mobile Computing Systems and Applications (HotMobile)*, 2014, Santa Barbara, CA.
25. **Toward Providing Security for Mobile Games**. Amir Yahyavi, Jeffrey Pang, Bettina Kemme. *8th Workshop on Mobility in the Evolving Internet Architecture (MobiArch)*, 2013, Miami, FL.
26. **SMOG: A Cloud Platform for Seamless Wide Area Migration of Network Games**. Virajith Jalaparti, Matthew Caesar, Seungjoon Lee, Jeffrey Pang, Jacobus Van der Merwe. In *11th Annual Workshop on Network and Systems Support for Games (NetGames)*, 2012, Venice, Italy.
27. **Characterizing Fairness for 3G Wireless Networks**. Vaneet Aggarwal, Rittwik Jana, Kadangode Ramakrishnan, Jeffrey Pang, N K Shankaranarayanan. In *IEEE International Workshop on Local and Metropolitan Area Networks (LANMAN)*, 2011, Chapel Hill, NC.
28. **Predicting Handoffs in 3G Networks**. Umar Javed, Dongsu Han, Ramon Caceres, Jeffrey Pang, Alexander Varshavsky, Srinivasan Seshan. In *ACM SOSP Workshop on Networking, Systems, and Applications on Mobile Handhelds (MobiHeld)*, 2011, Cascais, Portugal.
29. **Tryst: The Case for Confidential Service Discovery**. Jeffrey Pang, Ben Greenstein, Damon McCoy, Srinivasan Seshan, and David Wetherall. In *ACM SIGCOMM Workshop on Hot Topics in Networks (HotNets)*, 2007, Atlanta, GA. [18% acceptance rate]
30. **Can Ferris Bueller Still Have His Day Off? Protecting Privacy in the Wireless Era**. Ben Greenstein, Ramakrishna Gummadi, Jeffrey Pang, Mike Y. Chen, Tadayoshi Kohno, Srinivasan Seshan, and David Wetherall. In *USENIX Workshop on Hot Topics in Operating Systems (HotOS)*, 2007, San Diego, CA. [20% acceptance rate]

acceptance rate]

31. **Scaling Peer-to-Peer Games in Low Bandwidth Environments.** Jeffrey Pang, Frank Uyeda, and Jacob Lorch. In *International Workshop on Peer-to-Peer Systems (IPTPS)*, 2007, Bellevue, WA. [23% acceptance rate]

#### Selected Technical Reports and Invited Papers

- > **Quantifying and Mitigating Privacy Threats in Wireless Protocols and Services.** Jeffrey Pang. *Ph.D. Thesis, CMU CS Technical Report Number CMU-CS-09-145*, 2009.
- > **Player Dynamics in Massively Multiplayer Online Games.** Xinyu Zhuang, Ashwin Bharambe, Jeffrey Pang, Srinivasan Seshan. *CMU CS Technical Report Number CMU-CS-07-158*, 2007.
- > **Camera Models and Optical Systems Used in Computer Graphics: Part I, Object-Based Techniques.** Brian A. Barsky, Daniel R. Horn, Stanley A. Klein, Jeffrey A. Pang, Meng Yu. In *ICCSA: International Conference on Computational Science and Its Applications*, 2003, Montreal, QC, Canada. Invited paper.
- > **Camera Models and Optical Systems Used in Computer Graphics: Part II, Image-Based Techniques.** Brian A. Barsky, Daniel R. Horn, Stanley A. Klein, Jeffrey A. Pang, Meng Yu. In *ICCSA: International Conference on Computational Science and Its Applications*, 2003, Montreal, QC, Canada. Invited paper.

## PATENTS

#### Granted

1. **System for Internet scale visualization and detection of performance events.** Shobha Vekataraman, Jeffrey Pang, Subhabrata Sen, Oliver Spatscheck. U.S. Patent No. 8,671,183. Mar 11, 2014.
2. **System for Estimating Download Speed from Passive Measurements.** Jeffrey Pang, Karen Barnes, Dinesh Chachidhanandam, Alexandre Gerber, Michael Salmon, Oliver Spatscheck, Shobha Venkataraman. U.S. Patent No. 08462625. Jun 11, 2013.
3. **Reducing bandwidth requirements for peer-to-peer gaming based on error difference between actual.** John R Douceur, Jacob R Lorch, Jeffrey Anson Pang, Frank Christopher Uyeda. U.S. Patent No. 7925601. Apr 12, 2011.
4. **Reducing bandwidth requirements for peer-to-peer gaming based on importance of remote objects to a local player.** John R Douceur, Jacob R Lorch, Jeffrey Anson Pang, Frank Christopher Uyeda. U.S. Patent No. 7627632. Dec 1, 2009.

#### Pending

1. **Predicting Video Engagement from Wireless Network Measurements.** Jeffrey Pang, Jeffrey Erman, Lusheng Ji, Jia Wang. Filed with USPTO in 2014.
2. **Cellular Connection Sharing.** Lusheng Ji, Jeffrey Pang, Jia Wang, Shobha Venkataraman. Filed with USPTO in 2013.
3. **Method and Apparatus for Content Distribution Over a Network.** Kadangode Ramakrishnan, Yifan Hu, Robert Bell, Jeffrey Pang, Jeffrey Erman, Filed with USPTO in 2013.
4. **Optimized Game Server Relocation Environment.** Matthew Caesar, Virajith Jalaparti, Seungjoon Lee, Jeffrey Pang, Kobus Van der Merwe. Filed with USPTO in 2012.