

Jeffrey A. Pang

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SUMMARY

Dr. Jeffrey Pang is a research scientist/engineer specializing in software platforms and measurement tools for wireless, mobile, and network systems. He has 8+ years of experience building software prototypes and analyzing "big data" in industrial and academic environments. His research has been deployed in a U.S.-wide production network, published in 20 papers, and patented. He has particularly extensive experience with cellular data networks, 802.11 wireless networks, location privacy, and network game architecture.

EDUCATION

- | | |
|-------------|---|
| 2003 – 2009 | Ph.D. in Computer Science, Carnegie Mellon University <ul style="list-style-type: none">Thesis Topic: Quantifying and Mitigating Privacy Threats in Wireless Protocols |
| | M.S. in Computer Science, Carnegie Mellon University |
| 1999 – 2003 | B.A. in Computer Science with Highest Honors, UC Berkeley <ul style="list-style-type: none">Highest Achievement Award in Computer Science (1st in major) |

PROFESSIONAL EXPERIENCE

- | | |
|----------------|---|
| 2009 – Present | Senior Member of Technical Staff – Research
AT&T Labs Research, Florham Park, NJ |
| 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 |

TEACHING AND MENTORING

- Mentoring at AT&T Labs:**
 - Aaron Gember, Research Intern, 2011 (Ph.D. candidate, University of Wisconsin - Madison)
 - Umar Javed, Student Collaborator, 2011 (Ph.D. candidate, Carnegie Mellon University)
 - Zubair Shafiq, Research Intern, 2011 (Ph.D. candidate, Michigan State University)
 - Qiang Xu, Research Intern, 2010 (Ph.D. candidate, University of Michigan)
 - Virajith Jalaparti, Research Intern, 2010 (Ph.D. candidate, University of Illinois at Urbana-Champaign)
- Mentoring at Carnegie Mellon University:**
 - Xinyu Zhang, Masters Student, 2007
- Teaching Assistant:**

PUBLICATIONS

Current Work in Submission

- **A First Look at Cellular Machine-to-Machine Traffic – Large Scale Measurement and Characterization.** Zubair Shafiq, Lusheng Ji, Alex Liu, Jeffrey Pang, Jia Wang.
- **Targeted Crowdsourcing for Measuring Cellular Network Performance.** Aaron Gember, Aditya Akella, Ramon Caceres, Jeffrey Pang, Alexander Varshavsky.
- **OGRE: A Cloud Platform for Seamless Wide Area Migration of Networked Games.** Virajith Jalaparti, Matthew Caesar, Seungjoon Lee, Jeffrey Pang, Kobus Van der Merwe.

Refereed Conference Publications

1. **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. To appear. [18% acceptance rate]
2. **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]
3. **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]
4. **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]
5. **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]
6. **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]
7. **Donnybrook: Enabling Large-Scale, High-Speed, Peer-to-Peer Games.** Ashwin Bharambe, 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]
8. **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]
9. **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]
10. **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]
11. **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]
12. **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]

13. **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]
14. **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

15. **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

16. **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.
17. **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.
18. **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]
19. **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]
20. **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.

EXTERNAL TALKS

1. **Speed Testing without Speed Tests: Estimating Achievable Download Speed from Passive Measurements.** At *IMC and University of Waikato*, 2010.
2. **Wifi-Reports: Improving Wireless Network Selection with Collaboration.** At *MobiSys*, 2009.
3. **Improving the Privacy of Wireless Protocols.** At *Qualcomm Research Center, Google Seattle, RSA Laboratories, Telefonica Research, University of Colorado at Boulder, Palo Alto Research Center, AT&T Labs – Research, and Microsoft Research ISRC-PADS*, 2009.
4. **Donnybrook: Enabling Large-Scale, High-Speed, Peer-to-Peer Games.** At *SIGCOMM*, 2008.
5. **Improving Wireless Privacy with an Identifier-Free Link Layer Protocol.** At *MobiSys*, 2008.

6. **Mechanisms to Mitigate Wireless Privacy Threats.** At *MobiSys Ph.D. Forum*, 2008.
7. **Tryst: The Case for Confidential Service Discovery.** At *HotNets*, 2007.
8. **802.11 User Fingerprinting.** At *MobiCom*, 2007.
9. **Defragmenting DHT-based Distributed File Systems.** At *ICDCS*, 2007.
10. **Scaling Peer-to-Peer Games in Low Bandwidth Environments.** At *IPTPS*, 2007.
11. **Scaling Peer-to-Peer Multiplayer Games with Doppelgangers.** At *OSDI*, 2006. Poster session.
12. **Colyseus: A Distributed Architecture for Interactive Multiplayer Games.** At *OSDI Workshop on Real Large Distributed Systems (WORLDS)*, 2006. Demo session.
13. **Availability, Usage, and Deployment Characteristics of the Domain Name System.** At *IMC*, 2004.

PATENTS

Granted

1. **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.
2. **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. **Internet scale visualization and detection of performance events using Adaptive Decision Trees.** Jeffrey Pang, Subhabrata Sen, Oliver Spatscheck, Shobha Venkataraman, Filed with USPTO in 2010.
2. **Estimating Achievable Download Speed from Passive Measurements.** Alexandre Gerber, Jeffrey Pang, Oliver Spatscheck, Shobha Venkataraman. Filed with USPTO in 2010.
3. **Optimized Game Server Relocation Environment.** Matthew Caesar, Virajith Jalaparti, Seungjoon Lee, Jeffrey Pang, Kobus Van der Merwe. Filed with USPTO in 2010.

AWARDS AND HONORS

- **Best Paper Award:** MobiSys, 2008
- **Highest Achievement Award in Computer Science:** U.C. Berkeley, 2003
- **Upsilon Pi Epsilon:** U.C. Berkeley, 2001

PROFESSIONAL ACTIVITIES

- **General Chair:**
2010: ACM Mobisys PhD Forum
- **Technical Program Committee:**
2012: ACM MobiSys, PAM, COMSNETS
2011: ACM MobiHeld, ACM/IEEE NetGames
2010: ICPP, USENIX INM/WREN