

# John C. Chuang

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University of California at Berkeley  
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## EDUCATION

**Ph.D., Engineering and Public Policy**, Carnegie Mellon University, December 1998  
Dissertation title: “Economies of Scale in Information Dissemination over the Internet”  
Advisor: Marvin Sirbu. Committee: Alex Hills, Granger Morgan, Hui Zhang

**M.S., Engineering and Public Policy**, Carnegie Mellon University, May 1997

**M.S., Electrical Engineering**, Stanford University, June 1992

**B.S., Electrical Engineering**, *Summa cum laude*, University of Southern California, May 1991  
Salutatorian, Class of 1991  
Student President, USC Engineering Honors Program, 1990-1991  
Honor Societies: Tau Beta Pi, Phi Kappa Phi, Alpha Lambda Delta, Golden Key National Honor Society

## ACADEMIC APPOINTMENTS

### UC Berkeley:

Professor, School of Information, UC Berkeley, July 2010 – present  
Professor, Below-the-Line, Electrical Engineering and Computer Sciences, July 2010 – present  
Associate Professor, School of Information, July 2005 – June 2010  
Assistant Professor, Below-the-Line, EECS, July 2003 – June 2010  
Assistant Professor, School of Information Management & Systems, July 1999 – June 2005

### Carnegie Mellon University:

Post-Doctoral Fellow, School of Computer Science, January – June 1999 Advisor: Hui Zhang

## ACADEMIC AFFILIATIONS

Co-Director, BioSENSE Lab, 2015 – present  
Senior Fellow, Berkeley Institute for Data Science (BIDS), 2014 – present  
Faculty, Team for Research in Ubiquitous Secure Technology (TRUST), 2009 – present

## INDUSTRY POSITIONS

Co-Founder, boxbabble, 2007 – 2014  
Member of Technical Staff, Silicon Graphics Inc., July 1992 – July 1995

## AWARDS

Distinguished Teaching Award, School of Information, UC Berkeley, 2011  
Distinguished Teaching Award, School of Information, UC Berkeley, 2009  
Distinguished Teaching Award, School of Information, UC Berkeley, 2006  
UCB Distinguished Faculty Mentors Award – Nominee, 2004  
Best Paper Award, 4th International Conference on Mobile Data Management (MDM), 2003  
Distinguished Teaching Award – Honorable Mention, School of Information Management & Systems, UC Berkeley, 2002  
Distinguished Teaching Award, School of Information Management & Systems, UC Berkeley, 2001  
Distinguished Teaching Award, School of Information Management & Systems, UC Berkeley, 2000  
Hebert Toor Best Qualifier Paper Award, Department of Engineering and Public Policy, CMU, 1997  
Council on Library and Information Resources A. R. Zipf Fellow in Information Management, 1997  
Phi Kappa Phi Outstanding Freshman Award, USC, 1989

## PUBLICATIONS

Listed in chronological order. Non-refereed publications are noted with an asterisk (\*).

1. A. Ahi, A. Bomdica, G. Shippen, H. Sucar, H. Su, J. Chuang, N. Vasseghi, R. Ramchandani, R. Martin, R. Conrad, Y. Chen, K. Yeager, W. Voegtli Jr., M. Seddighnezhad, Y. Van Atta, **MIPS R10000 Superscalar Microprocessor**. HOT CHIPS Symposium VII, Stanford CA, August 13-15, 1995.
2. \* M. Sirbu and J. Chuang, **Public-Key Based Ticket Granting Service in Kerberos**, IETF Internet Draft, May 1996.
3. M. Sirbu and J. Chuang, **Distributed Authentication in Kerberos Using Public Key Cryptography**. Proceedings of the Internet Society Symposium on Network and Distributed System Security (NDSS'97), February 1997.
4. J. Chuang and M. Sirbu, **Pricing Multicast Communications: A Cost-Based Approach**. Proceedings of the Internet Society INET'98 Conference, July 1998.
5. \* J. Chuang, **Economies of Scale in Information Dissemination over the Internet**. Ph.D. Dissertation, Carnegie Mellon University, Pittsburgh Pennsylvania, November 1998.
6. J. Chuang and M. Sirbu, **Distributed Network Storage with Quality-of-Service Guarantees**. Proceedings of the Internet Society INET'99 Conference, June 1999.
7. J. Chuang, **Network Transmission and Storage: Vertical Relationships and Industry Structure**. 27th Telecommunications Policy Research Conference, September 1999. (Abstract reviewed paper)
8. J. Chuang and M. Sirbu, **Optimal Bundling Strategy for Digital Information Goods: Network Delivery of Articles and Subscriptions**. *Information Economics and Policy* 11(2): 147-176, 1999.
9. J. Chuang, **Resource Allocation for stor-serv: Network Storage Services with QoS Guarantees**. Proceedings of Internet2 Network Storage Symposium, October 1999.

10. J. Chuang and M. Sirbu, **Distributed Network Storage with Quality-of-Service Guarantees**. *Journal of Network and Computer Applications* 23(3): 163-185, July 2000.
11. J. Chuang and M. Sirbu, **Network Delivery of Information Goods: Optimal Pricing of Articles and Subscriptions**. In *Internet Publishing and Beyond: The Economics of Digital Information and Intellectual Property*, by B. Kahin and H. Varian (eds.), MIT Press, August 2000.
12. A. Myers, J. Chuang, U. Hengartner, Y. Xie, W. Zhuang, and H. Zhang, **A Secure, Publisher-Centric Web Caching Infrastructure**. Proceedings of IEEE INFOCOM 2001, April 2001.
13. J. Chuang and M. Sirbu, **Pricing Multicast Communications: A Cost-Based Approach**. *Telecommunication Systems* 17 (3): 281-297, July 2001.
14. J. Chuang, **Economics of Scalable Network Services**. Proceedings of SPIE ITCOM 2001, August 2001.
15. K. Norlen, G. Lucas, M. Gebbie, and J. Chuang, **EVA: Extraction, Visualization and Analysis of the Telecommunications and Media Ownership Network**. Proceedings of International Telecommunications Society 14th Biennial Conference (ITS2002), August 2002.
16. M. Feldman and J. Chuang, **Service Differentiation in Web Caching and Content Distribution**. Proceedings of IASTED International Conference on Communications and Computer Networks, November 2002.
17. J. Chuang, S. Kafka, and K. Norlen, **Efficiency and Performance of Web Cache Reporting Strategies**. Proceedings of IEEE International Workshop on Data Semantics in Web Information Systems, December 2002.
18. K. Hosanagar, R. Krishnan, J. Chuang, and V. Choudhary, **Pricing Vertically Differentiated Web Caching Services**. Proceedings of International Conference on Information Systems (ICIS 2002), December 2002.
19. A. Ghose, J. Grossklags, and J. Chuang, **Resilient Data-Centric Storage in Wireless Sensor Networks**. Proceedings of 4th International Conference on Mobile Data Management (MDM 2003), January 2003. Best Paper Award. Also appeared in *Lecture Notes in Computer Science* series, No. 2574, pp. 45-62, Springer Verlag, 2003.
20. M. Feldman, K. Lai, J. Chuang and I. Stoica, **Quantifying Disincentives in Peer-to-Peer Networks**. 1st Workshop on Economics of Peer-to-Peer Systems, June 2003.
21. K. Lai, M. Feldman, I. Stoica and J. Chuang, **Incentives for Cooperation in Peer-to-Peer Networks**. 1st Workshop on Economics of Peer-to-Peer Systems, June 2003.
22. G. Lucas, M. Gebbie, K. Norlen and J. Chuang, **Improving Transparency: Extracting, Visualizing, and Analyzing Corporate Relationships from SEC 10-K Documents**. 7th International Conference on Technology Policy and Innovation, June 10-13 2003.

23. G. Lucas, A. Ghose, and J. Chuang, **On Characterizing Affinity and Its Impact on Network Performance**. Proceedings of ACM SIGCOMM Workshop on Models, Methods and Tools for Reproducible Network Research, August 2003.
24. J. Chuang, **Economics of Ad-Hoc, Overlay and Traditional Networks: A Topological Perspective**, ACM SIGCOMM Workshop on Network Research: Exploration of Dimensions and Scope, August 2003. (Refereed position paper)
25. A. Ghose, J. Grossklags, and J. Chuang, **Resilient Data-Centric Storage in Wireless Sensor Networks**. *IEEE Distributed Systems Online*. November 2003.
26. K. Hosanagar, R. Krishnan, M. Smith and J. Chuang. **Optimal Pricing of Content Distribution Network Services**. Proceedings of HICSS 2004, January 2004.
27. N. Christin and J. Chuang. **On the Cost of Participating in a Peer-to-Peer Network**. Proceedings of 3rd International Workshop on Peer-to-Peer Systems (IPTPS'04), February 2004. Also appeared in *Lecture Notes in Computer Science* series, Springer Verlag, 2004.
28. J. Chuang. **Designing Incentive Mechanisms for Peer-to-Peer Systems**. Proceedings of 1st IEEE Workshop on Grid Economics and Business Models, April 2004. (Invited full paper)
29. M. Feldman, K. Lai, I. Stoica, and J. Chuang, **Robust Incentive Techniques for Peer-to-Peer Networks**. Proceedings of 5th ACM Conference on Electronic Commerce (EC'04), May 2004.
30. A. Habib and J. Chuang, **Incentive Mechanism for Peer-to-Peer Media Streaming**. Proceedings of 12th IEEE International Workshop on Quality of Service, Montreal Canada, June 2004.
31. M. Feldman and J. Chuang, **Hidden-Action in Multi-Hop Routing**. 2nd Workshop on Economics of Peer-to-Peer Systems, Cambridge MA, June 2004.
32. N. Christin, J. Grossklags and J. Chuang, **Near Rationality and Competitive Equilibria in Networked Systems**. Proceedings of ACM SIGCOMM Workshop on Practice and Theory of Incentives in Networked Systems (PINS), August 2004.
33. Y. Chu, J. Chuang, and H. Zhang, **A Case for Taxation in Peer-to-Peer Streaming Broadcast**. Proceedings of ACM SIGCOMM Workshop on Practice and Theory of Incentives in Networked Systems (PINS), August 2004.
34. M. Feldman, C. Papadimitriou, J. Chuang, and I. Stoica, **Free-Riding and Whitewashing in Peer-to-Peer Systems**. Proceedings of ACM SIGCOMM Workshop on Practice and Theory of Incentives in Networked Systems (PINS), August 2004. Also presented at the 3rd Workshop on Economics and Information Security (WEIS04), May 2004.
35. A. Habib, D. Xu, M. Atallah, B. Bhargava and J. Chuang, **Verifying Data Integrity in Peer-to-Peer Media Streaming**. ACM/SPIE Multimedia Computing and Networking (MMCN '05), January 2005.
36. N. Christin and J. Chuang, **A Cost-Based Analysis of Overlay Routing Geometries**. Proceedings of IEEE INFOCOM, March 2005.

37. A. Habib, J. Chuang. **A Measurement-Based Analysis of Residential Multihoming**. IEEE INFOCOM, March 2005. (Refereed poster paper)
38. A. Habib, J. Chuang, **Multihoming Media Streaming**. IEEE Workshop on Multimedia Systems and Networking (WMSN '05), April 2005.
39. N. Christin, A. Weigend, and J. Chuang, **Content Availability, Pollution and Poisoning in Peer-to-Peer File Sharing Networks**. Proceedings of ACM E-Commerce Conference (EC'05), June 2005.
40. M. Feldman, J. Chuang, I. Stoica, and S. Shenker, **Hidden-Action in Multi-Hop Routing**. Proceedings of ACM E-Commerce Conference (EC'05), June 2005.
41. M. Feldman, J. Chuang, **The Evolution of Cooperation under Cheap Pseudonyms**. Proceedings of 7th International IEEE Conference on E-Commerce Technology (CEC'05), July 2005.
42. M. Feldman and J. Chuang. **Overcoming Free-Riding Behavior in Peer-to-Peer Systems**, *ACM Sigecom Exchanges*, Summer 2005.
43. A. Habib, D. Xu, M. Atallah, B. Bhargava and J. Chuang, **A Tree-based Forward Digest Protocol to Verify Data Integrity in Distributed Media Streaming**. *IEEE Transactions on Knowledge and Data Engineering*, July 2005.
44. K. Hosanagar, R. Krishnan, J. Chuang, and V. Choudhary, **Pricing and Resource Allocation in Caching Services with Multiple Levels of Quality of Service**. *Management Science*, Vol. 51, No. 12, December 2005.
45. \* P. Laskowski, J. Chuang. **Antitrust Scrutiny of Price-Fixing Clauses in Patent Licenses**. Working Paper, 2005.
46. A. Habib and J. Chuang, **MMS: A Multihome-Aware Media Streaming System**. Proceedings of 13th Multimedia Computing and Networking Conference (MMCN '06), January 2006.
47. A. Habib, N. Christin, and J. Chuang, **Taking Advantage of Multihoming with Session Layer Striping**, Proceedings of the 9th IEEE Global Internet Symposium (Global Internet 2006), pages 102-107, April 2006.
48. M. Feldman, C. Papadimitriou, J. Chuang, and I. Stoica, **Free-Riding and Whitewashing in Peer-to-Peer Systems**. *IEEE Journal on Selected Areas in Communications*, Vol. 24, No. 5, May 2006.
49. A. Habib and J. Chuang, **Service Differentiated Peer Selection: An Incentive Mechanism for Peer-to-Peer Media Streaming**. *IEEE Transactions on Multimedia*, Vol. 8, No. 3, June 2006.
50. \* J. Feigenbaum, J. Chuang, D. Pennock, editors, **Proceedings of the 7th ACM Conference on Electronic Commerce**, ACM, June 2006.

51. P. Laskowski and J. Chuang, **Network Monitors and Contracting Systems: Competition and Innovation**. Proceedings of ACM SIGCOMM, September 2006.
52. G. Lucas, M. Gebbie, K. Norlen and J. Chuang, **Improving Transparency: Extracting, Visualizing, and Analyzing Corporate Relationships from SEC 10-K Documents**. *International Journal on Technology, Policy and Management*, Vol. 7, No. 1, pp. 15-31, 2007.
53. M. Feldman, J. Chuang, I. Stoica, S. Shenker. **Hidden-Action in Network Routing**. *IEEE Journal on Selected Areas in Communications*, 2007.
54. M. Babaioff, J. Chuang. **On the Optimality and Interconnection of Valiant Load-Balancing Networks**. Proceedings of the 26th Annual IEEE Conference on Computer Communications (IEEE INFOCOM), May 2007.
55. A. Habib, N. Christin, J. Chuang. **On the Feasibility of Switching ISPs in Residential Multihoming**. Proceedings of International Workshop on Quality-of-Service (IWQoS), June 2007.
56. A. Habib, J. Chuang. **Improving Application QoS with Residential Multihoming**. *Computer Networks*, Volume 51, Issue 12, Pages 3323-3337, August 2007.
57. D. Joseph, N. Shetty, J. Chuang, I. Stoica. **Modeling the Adoption of New Network Architectures**. Proceedings of ACM CoNEXT, December 2007.
58. M. Babaioff, J. Chuang, M. Feldman. **Incentives in Peer-to-Peer Systems**. Chapter 23 of N. Nisan, T. Roughgarden, E. Tardos, V. Vazirani, eds., *Algorithmic Game Theory*, Cambridge University Press, 2007.
59. S. Buchegger, J. Chuang. **Encouraging Cooperative Interaction Among Network Entities**. Book chapter in F.H.P. Fitzek, M.D. Katz, eds., *Cognitive Wireless Networks: Concepts, Methodologies and Visions Inspiring the Age of Enlightenment of Wireless Communications*, Springer, 2007.
60. J. Grossklags, N. Christin, J. Chuang. **Secure or Insure? A Game-Theoretic Analysis of Information Security Games**. Proceedings of the 17th International World Wide Web Conference (WWW2008), April 2008.
61. J. Grossklags, N. Christin, J. Chuang. **Predicted and Observed User Behavior in the Weakest-Link Security Game**. Proceedings of the 2008 USENIX Workshop on Usability, Psychology, and Security (UPSEC'08), April 2008.
62. J. Grossklags, N. Christin, J. Chuang. **Security Investment (Failures) in Five Economic Environments: A Comparison of Homogeneous and Heterogeneous User Agents**. 7th Workshop on the Economics of Information Security (WEIS'08), June 2008.
63. J. Grossklags, N. Christin, J. Chuang. **Security and Insurance Management in Networks with Heterogeneous Agents**. Proceedings of ACM E-Commerce Conference (EC 2008), July 2008.
64. P. Laskowski, B. Johnson, J. Chuang. **User-Directed Routing: From Theory, towards Practice**. Proceedings of ACM SIGCOMM Workshop on the Economics of Networks, Systems,

and Computation (NetEcon 2008), August 2008.

65. N. Christin, J. Chuang, J. Grossklags, **Economics-Informed Design of Content Delivery Networks**. in: R. Buyya, A.K. Pathan, A. Vakali, eds., *Content Delivery Networks: Principles and Paradigms*, Springer Verlag, August 2008.
66. K. Hosanagar, J. Chuang, R. Krishnan, M. D. Smith, **Service Adoption and Pricing of Content Delivery Network (CDN) Services**. *Management Science*, September 2008.
67. \* P. Laskowski, J. Chuang. **Empowering Users to Break the Internet Impasse**. UC Berkeley Technical Report. Feb 26, 2009. Presented at I3P Workshop on the Economics of Securing the Information Infrastructure, March 2009.
68. P. Laskowski, J. Ubois, D. Marvit, J. Chuang. **Exploring Digital Content in the Age of Peer-to-Peer**. Proceedings of Workshop on the Economics of Networks, Systems, and Computation (NetEcon 2009), July 2009.
69. \* J. Chuang, L. Fortnow, P. Pu, editors, **Proceedings of the 10th ACM Conference on Electronic Commerce**, ACM, July 2009.
70. P. Laskowski, J. Chuang. **A Leap of Faith? From Large-Scale Testbed to the Global Internet**. Telecommunications Policy Research Conference, September 2009. (Abstract reviewed paper)
71. A. Cardenas, J. Chuang, J. Grossklags, S. Radosavac, C. Hoofnagle, V. Paxson. **An Economic Map of Cybercrime**. Telecommunications Policy Research Conference, September 2009. (Abstract reviewed paper)
72. J. Grossklags, S. Radosavac, A. Cardenas, J. Chuang. **Nudge: Intermediaries' Role in Interdependent Network Security**. Proceedings of 3rd International Conference on Trust and Trustworthy Computing (Trust'10), June 2010. Published in: A. Acquisti, S. Smith, and A.-R. Sadeghi (Eds.), *Lecture Notes in Computer Science (LNCS)*, No. 6101, Springer Verlag, 2010, pp. 323-336.
73. B. Johnson, J. Grossklags, N. Christin, J. Chuang. **Are Security Experts Useful? Bayesian Nash Equilibria for Network Security Games with Limited Information**. Proceedings of 15th European Symposium on Research in Computer Security (ESORICS 2010), September 2010.
74. P. Laskowski, J. Chuang. **Innovations and Upgrades in Virtualized Network Architectures**. Proceedings of 2010 Workshop on the Economics of Networks, Systems, and Computation (NetEcon 2010), October 2010.
75. B. Johnson, J. Grossklags, N. Christin, J. Chuang. **Uncertainty in Interdependent Security Games**. Proceedings of 2010 Conference on Decision and Game Theory for Security (GameSec 2010), November 2010.
76. \* J. Chuang. **Incentive Dynamics in Interdependent Network Security. Or: Buying a Raft and Out-Running a Bear**. Invited plenary lecture paper, 2nd International Conference on Game Theory for Networks (GameNets 2011), April 2011.
77. B. Johnson, J. Grossklags, N. Christin, J. Chuang. **Nash Equilibria for Weakest Target Security Games with Heterogeneous Agents**. Proceedings of 2nd International Conference on

Game Theory for Networks (GameNets 2011), April 2011.

78. J. Chuang. **Loci of Competition for Future Internet Architectures**. *IEEE Communications Magazine*, Special Issue on Future Internet Architectures: Design and Deployment Perspectives, July 2011.
79. P. Chia, J. Chuang. **Colonel Blotto in the Phishing War**. Proceedings of Conference on Decision and Game Theory for Security (GameSec 2011), November 2011.
80. P. Chia, J. Chuang. **Community-based Web Security: Complementary Roles of the Serious and Casual Contributors**. Proceedings of ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2012), February 2012.
81. B. Johnson, J. Chuang, J. Grossklags, N. Christin. **Metrics for Measuring ISP Badness: The Case of Spam**. Proceedings of 16th International Conference on Financial Cryptography and Data Security (FC 2012), February 2012.
82. J. Chuang, H. Nguyen, C. Wang, B. Johnson. **I Think, Therefore I Am: Usability and Security of Authentication Using Brainwaves**. 2013 Workshop on Usable Security (USEC 2013), Proceedings of 17th International Conference on Financial Cryptography and Data Security (FC 2013), April 2013.
83. S. Benthall, J. Chuang. **Computational Asymmetry in Strategic Bayesian Networks**. Joint Workshop on Pricing and Incentives in Networks and Systems W-PIN+NetEcon, June 2013. (Refereed poster paper)
84. M. Densmore, B. Bellows, J. Chuang, E. Brewer. **The Evolving Braid: How an Organization in Uganda Achieved Reliable Communications**. Proceedings of Sixth International Conference on Information and Communication Technologies and Development (ICTD 2013), December 2013.
85. P. Laskowski, B. Johnson, T. Maillart, J. Chuang, **Government Surveillance and Incentives to Abuse Power**. 13th Workshop on the Economics of Information Security (WEIS 2014), June 2014.
86. M. Klein, T. Maillart, J. Chuang. **Characterizing Contribution Strategies and Quality with Bi-Partite Networks**. NetSci 2014, June 2014. (Refereed poster paper)
87. J. Chuang. **One-Step Two-Factor Authentication with Wearable Bio-Sensors**. Workshop on “Who are you?! Adventures in Authentication” (WAY 2014), Symposium on Usable Privacy and Security (SOUPS 2014), July 2014.
88. B. Johnson, T. Maillart, J. Chuang. **My Thoughts are Not Your Thoughts: Robustness of Brainwave Signal Authentication Against Impersonation Attacks**. Workshop on Usable Privacy & Security for wearable and domestic ubiquitous DEvices (UPSIDE 2014), ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2014), September 2014.
89. \* J. Chuang, P. Loiseau, editors, **The Joint Workshop on Pricing and Incentives in Networks and Systems (W-PIN+NetEcon 2014)**, *ACM Performance Evaluation Review*, December 2014.



90. \* B. Johnson, J. Chuang, editors, **The First Workshop on Wearable Security and Privacy**, *Springer Lecture Notes in Computer Science*, January 2015.
91. N. Merrill, T. Maillart, B. Johnson, J. Chuang. **Improving Physiological Signal Classification Using Logarithmic Quantization and a Progressive Calibration Technique**. Proceedings of 2nd International Conference on Physiological Computing Systems (PhyCS 2015), February 2015.
92. M. Klein, T. Maillart, J. Chuang. **The Virtuous Circle of Wikipedia: Recursive Measures of Quality and Expertise**. Proceedings of 18th ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2015), March 2015.
93. \* J. Chuang, N. Merrill, T. Maillart, and Students of the UC Berkeley Fall 2014 INFO290 Class. **Synchronized Brainwave Recordings from a Group Presented with a Common Visual Stimulus**. March 2015. <http://bit.ly/synchronized-brain-recordings>
94. \* J. Chuang, N. Merrill, T. Maillart, and Students of the UC Berkeley Spring 2015 MIDS Immersion Class. **Synchronized Brainwave Recordings from a Group Presented with a Common Audio-Visual Stimulus**. May 2015. [http://biosense.berkeley.edu/indra\\_mids\\_5\\_15\\_dlpage/](http://biosense.berkeley.edu/indra_mids_5_15_dlpage/)
95. B. Johnson, P. Laskowski, T. Maillart, J. Chuang, N. Christin, **Caviar and Yacht: How Your Purchase Data Can Come Back to Haunt You**. 14th Workshop on the Economics of Information Security (WEIS 2015), June 2015.
96. P. Paredes, R. Ko, A. Aghaseyedjavadi, L. Bähler, J. Canny, J. Chuang. **Synestouch - Haptic + Audio Design for Wearable Devices**. Proceedings of 6th Conference on Affective Computing and Intelligent Interactions (ACII 2015), September 2015.
97. R. Bora, A. McConachie, J. Chuang, B. Shapiro. **Audio Autonomy: An Ambient, Interactive Audio Companion System for Dementia Patients and Caregivers**. 5th Workshop on Interactive Systems in Healthcare (WISH), ACM Conference on Human Factors in Computing Systems (CHI 2016), May 2016.
98. P. Chia, J. Chuang, Y. Chen. **Whack-a-mole: Asymmetric Conflict and Guerrilla Warfare in Web Security**. 15th Workshop on the Economics of Information Security (WEIS 2016), June 2016.
99. T. Maillart, M. Zhao, J. Grossklags, J. Chuang. **Given Enough Eyeballs, All Bugs Shallow? Revisiting Eric Raymond with Bug Bounty Markets**. 15th Workshop on the Economics of Information Security (WEIS 2016), June 2016.
100. N. Merrill, M. Curran, J. Yang, J. Chuang. **Classifying Mental Gestures with In-Ear EEG**. Proceedings of IEEE EMBS 13th Annual International Body Sensor Networks Conference (BSN 2016), June 2016.
101. T. Maillart, N. Merrill, J. Chuang. **Brain Decoding using EEG-controlled Rapid Serial Visual Presentation**. 22nd Annual Meeting of the Organization for Human Brain Mapping (OHBM 2016), June 2016.

102. E. Sedenberg, J. Chuang, D. Mulligan. **Designing Commercial Therapeutic Robots for Privacy Preserving Systems and Ethical Research Practices Within the Home.** *International Journal of Social Robotics*, June 2016.
103. M. Curran, J. Yang, N. Merrill, J. Chuang. **Passthoughts Authentication with Low Cost EarEEG.** Proceedings of 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2016), August 2016.

## TEACHING

### Courses

INFO 206: Distributed Computing Applications and Infrastructure  
(F99, S02, S03, S04, S05, F05, F06, F07, F08, F09, F10, F13)

INFO 234: Information Technology Economics, Strategy, and Policy  
(offered as INFO 290 in F08, F11); (S14, S15, S16)

INFO 250: Computer-Based Communications Networks and Systems  
(S00, S01, F01, F02, F03, F04, S06, F07, S10, S11)

INFO 290: Special Topics  
Seminar on Ubiquitous Sensing (S16)  
Sensors, Humans, Data, Apps (F14, F15)  
Open Collaboration and Peer Production (F13)  
Economics of Network Security and Privacy (S08)  
Advanced Topics in Computer Networking (S01)

INFO 295: Doctoral Colloquium  
(F01, S02, S15)

INFO 296A: Research Seminars  
Economics-Informed Network Design (F05)  
Research Methods (S01)

### Postdoctoral Scholars (n=8)

Nicolas Christin (2003-2005)  
Ahsan Habib (2003-2005)  
Sonja Buchegger (2004-2006)  
Pedro Ferreira (2004-2005)  
Moshe Babaioff (2005-2007)  
Benjamin Johnson (2009-2011; 2013-2014)  
Timo Smura (2012-2013)  
Thomas Maillart (2013-present)

### PhD Dissertation Committee, Chair (n=5)

Michal Feldman, Incentives for Cooperation in Peer-to-Peer Systems, 2005

Paul Laskowski, Designing Networks for Innovation, 2009  
Jens Grossklags, Secure or Insure: An Economic Analysis of Security Interdependencies and Investment Types, 2009  
Melissa Densmore, The Evolving Braid: An Ethnography of Technology Change in Developing Regions, 2012 (Co-Chair)  
Ashwin Mathew, Where in the World is the Internet? Locating Political Power in Internet Infrastructure, 2014 (Co-Chair) -- **Winner of the 2016 iSchools Doctoral Dissertation Award**

PhD Dissertation Committee, Inside Member (n=6)

Alessandro Acquisti, Essays on Privacy, Anonymity, and Tracking in Computer-mediated Economic Transactions, 2003  
Barbara Rosario, Extraction of semantic relations from bioscience text, 2005  
Nathan Good, Designing for Informed Consent: A multi-domain, interdisciplinary analysis of the technological means to provide informed consent, in order to manage users' privacy and security, 2008  
Fredrik Wallenberg, Three Essays in Information Economics, 2009  
Patrick Riley, The Revolution Will Be Televised: Identifying, Organizing, and Presenting Correlations Between Social Media and Broadcast Television, 2011  
Joshua Blumenstock, Essays on the Economic Impacts of Mobile Phones in Sub-Saharan Africa, 2012  
Yiming Liu (in progress)  
Sebastian Benthall (in progress)

PhD Dissertation Committee, Outside Member (n=57)

Brian Whetten, Reliable Multicast Congestion Control and the Reliable Multicast Transport Protocol II (RMTP-II), 2000  
Richard Mortimer, Investment and Cooperation Among Internet Backbone, 2001  
Weiyi Li, Agent-Augmented Network Signaling for Call-Setup, 2002  
Christoforos Kozyrakis, Scalable Vector Media-processors for Embedded Systems, 2002  
Sylvia Ratnasamy, A Scalable Content-Addressable Network, 2002  
Dawn Song, Automatic tools for building secure systems, 2003  
Philip Buonadonna, Architectural Interactions of I/O Networks and Inter-networks, 2003  
Jimmy Shih, Applying Congestion Pricing at Access Points for Voice and Data traffic, 2003  
Samuel Madden, The Design and Evaluation of a Query Processing Architecture for Sensor Networks, 2003  
Kartik Hosanagar, Three Essays on Design of Intermediation Services on the Internet, 2003  
Yan Chen, Towards a Scalable, Adaptive and Network-aware Content Distribution Network, 2003  
Aaron Brown, A Recovery-Oriented Approach to Dependable Services: Repairing Past Errors with System-wide Undo, 2003  
Z. Morley Mao, Solving the Interdomain Routing Puzzle -- Understanding Interdomain Routing Dynamics, 2003  
Fredrick Chun Bong Wong, An Architectural Evaluation of Integrating Reconfigurable Hardware into Parallel Systems, 2003  
Byunghoon Kang, S2D2: A Framework for Secure and Scalable Optimistic Replication, 2004  
Ben Zhao, Decentralized Object Location and Routing: A New Networking Paradigm, 2004  
Mehul Shah, Flux: A Mechanism for Building Robust, Scalable Dataflows, 2004  
Sharad Agarwal, Toward Interdomain Traffic Engineering for Availability and Performance, 2004  
Kay Sripanidkulchai, A Measurement-Driven Approach to Designing Peer-to-Peer Systems, 2004

John Musacchio, Pricing and Flow Control in Communications Networks, 2004  
Mustafa Ergen, I-WLAN: Intelligent Wireless Local Area Networking, 2004  
Randy Huang, Hardware-Assisted Fast Routing for Runtime Reconfigurable Computing, 2004  
Sean Rhea, OpenDHT: A Public DHT Service, 2005  
David Oppenheimer, Using distributed querying and actuation to improve the robustness, manageability, and performance of Internet-scale applications, 2005  
Lakshminarayanan Subramanian, Decentralized Security Mechanisms for Routing Protocols, 2006  
Anupam Banerjee, Fiber to the Premise (FTTP): Technology, Competition and Industry Structure, 2006  
Weidong Cui, Automating Malware Detection by Inferring Intent, 2006  
Tal Lavian, Lambda Data Grid: Communications Architecture in Support of Grid Computing, 2006  
Hakim Weatherspoon, Design and Evaluation of Distributed Wide-Area On-line Archival Storage Systems, 2006  
Boon Thau Loo, Declarative Networking: Extensible Networks with Declarative Queries, 2006  
Dennis Geels, Replay Debugging for Distributed Applications, 2006  
Byong-Gon Chun, Mechanisms to Tolerate Misbehavior in Replicated Systems, 2007  
Karthik Lakshminarayanan, Design of a Resilient and Customizable Routing Architecture, 2007  
Ananth Rao, Scheduling and Fairness in Multi-hop Wireless Networks, 2007  
Yitao Duan, P4P: A Practical Framework for Privacy-Preserving Distributed Computation, 2007  
Marco Barreno, Evaluating the Security of Machine Learning Algorithms, 2008  
Sergiu Nedeveschi, Maximizing Performance in Long Distance Wireless Networks for Developing Regions, 2008  
Rodrigo Fonseca, Improving Visibility of Distributed Systems through Execution Tracing, 2008  
Dilip Joseph, Making Packet Classification a Fundamental Network Primitive, 2009  
Jayanthkumar Kannan, On The Use of Context in Network Intrusion Detection Systems, 2009  
Alexandra Meliou, Querying Uncertain Data in Resource Constrained Settings, 2009  
Archana Ganapathi, Predicting and Optimizing System Utilization and Performance via Statistical Machine Learning, 2009  
Nikhil Shetty, Design of Network Architectures: Role of Game Theory and Economics, 2010  
Junda Liu, Routing Along DAGs, 2011  
Hao Zhang, An Optimized Video-on-Demand System: Theory, Design and Implementation, 2012  
Chia Yuan Cho, Techniques for Model Inference and Bug Finding, 2013  
Prashanth Mohan, Protecting User Privacy in Remotely Managed Applications, 2013  
Ganesh Ananthanarayanan, Optimizing Parallel Job Performance in Data-Intensive Clusters, 2014  
David Zats, Achieving Consistent Latencies in Datacenter Networks, 2014.  
Barrett Rhoden, Operating System Support for Parallel Processes, 2014.  
Kate Harrison, A quantitative approach to wireless spectrum regulation, 2015.  
Zhijie (Kevin) Chen, Abstract Semantics for Software Security Analysis, 2015.  
N M Mosharaf Kabir Chowdhury, Coflow: An Abstraction for Application-Aware Network Optimizations in Large Clusters, 2015.  
Justine Sherry (in progress)  
Haoyuan Li (in progress)  
Kay Ousterhout (in progress)  
Raunak Bhinge (in progress)

Ph.D. Qualifying Exam Committees (n=64; chair for 8)

Ph.D. Preliminary Exam Committees (n=5; chair for 2)

Masters Thesis Committee (n=3)

- Abhishek Ghose. Resilient Data-Centric Storage for Wireless Ad-Hoc Sensor Networks. Masters Thesis, EECS, 2003. (Chair)
- Ashima Atul. Compact Implementation of Distributed Inference Algorithms for Network Monitoring. Masters Thesis, Computer Science, 2008.
- Byung Gon Song. Driving Dataset in the Wild: Various Driving Scenes. Masters Thesis, Computer Science, 2016.

Masters Final Projects (n=19)

- Huney Kong. DoubleQuote.com -- vertical portal for Washington Correspondents. 2000 (**Best Project Award: 2nd Place**)
- Kim Norlen, Valarie Lanard, Gabriel Lucas. Media-Map: Visualizing Ownership in the Media Industry. 2001 (**Best Project Award: 2nd Place**)
- Bibi Ephraim, Karthik Gourisankaran, Jeffrey McNeill. TINA: Tool for Information Architects. 2001
- Steve Kafka, Ian Liu, Azeen Chamarbagwala. e-Decisions, facilitating collaborative group decision-making. 2002 (**Best Project Award: 3rd Place**)
- Gloria Chen, Linda Harjono, Saifon Obromsook. CourseLinx. 2002
- Orchuma Sakdamnuson, Jian Wu. Artist Central. 2002
- Paul Poling, Christina Nigro. mClinic. 2006
- Neal Fultz. Blue versus Red: Towards a model of distributed security attacks. 2008
- Johnson Nyugen. Course Threads. 2008
- Isaac Salier-Hellendag. Mapping San Francisco's Photographic History. 2009 (**Best Project Award: Honorable mention**)
- Angel Rodriguez, Brendan Curran. GameBadger: Mobile Gaming with a Social Twist. 2012 (**Best Project Award: Honorable mention**)
- Prabhavathi Matta, Vaidyanath Venkitasubramanian. Neuroclick. 2014
- Arezu Aghaseyedjavadi, Marjan Ghahremani, Dheera Prabhakar, Ruchita Rathi, Rahul Verma. City Trails. 2015 (**Best Project Award: Honorable mention**)
- Renu Bora, Andrew McConachie. Audio Autonomy. 2015 (**Best Project Award: Honorable mention**)
- Derek Kuo, Kiki Liu, Noriko Misra. LinkedLiving. 2015
- Pi-Tan Hu, Wenqin Chen. Mole-bile Voice. 2016 (**Best Project Award: Winner**)
- Audrey Leung, April Dawn Kester, Richard Chen. EudaeSense. 2016
- Bryan Morgan, Juan Shishido, Joshua Appleman, Anubhav Gupta, Robin Kalia. Hydrobase. 2016
- Aditya Mishra, Stephanie Snipes, Alexander Jones, Stacey Baradit, Sindhuja Jeyabal. Portal. 2016

Senior Honors Thesis, Reader

- Tiffany Hwu. Exploring the Uses of Psychological Models of Generalization in Music Recommendation Systems. 2014.

Research Experience for Undergraduates

- Hamilton Nguyen, Charles Wang. Usability and Security of Authentication Using Brainwaves. 2011-2012.
- Ryuka Ko. Haptic and Audio Design for Wearable Devices. 2015.
- Eric Huynh. At-Scale Emotion Recognition From Streaming Facial Images. 2016.

## **UNIVERSITY SERVICE**

Head Graduate Advisor, PhD Program, 2008-2012  
Chair, PhD Admissions Committee, 2008-2012  
Chair, Faculty Search Committee, 2007-2008, 2013-2014  
Member, Faculty Search Committee, 2005-2006, 2015-2016  
Member, Regents' and Chancellor's Scholarship Subcommittee, 2010-2011, 2013-2016  
Member, Admissions, Enrollment, and Preparatory Education Subcommittee, 2015-2016  
Member, MIMS Admissions Committee, 2000-2001, 2004-2005, 2014-2015  
Member, PhD Admissions Committee, 2000-2002, 2013-2014  
Member, PhD Program/Curriculum Committee, 2002, 2013-2014  
Member, Online Education Task Force, 2011-2012  
Member, MIMS Technology Curriculum Committee, 2005-2012  
Member, Departmental Space and Planning Committee, 2005-2006  
Member, Departmental Computing Committee, 2004-2005  
Member, Dean Search Committee, 2002-2003  
Member, Faculty Advisory Committee, VOCAL Campus Communications Strategic Planning Project, 2001-2002  
Chair and Member, various departmental and campus personnel ad hoc committees

## **EXTRAMURAL SUPPORT**

Faculty-Investigator, Center for Long-Term Cybersecurity, Hewlett Foundation, \$100,000, 2016.

In-Kind Sponsorship for "Sensors, Humans, Data, Apps" Course from: Intel Research and SensoMotoric Instruments, Fall 2015.

Faculty Research Award, Google, \$76,500, 2015.

In-Kind Sponsorship for "Sensors, Humans, Data, Apps" Course from: Advanced Brain Monitoring, Google, Neurosky, Oculus, and SensoMotoric Instruments, Fall 2014.

Faculty-Investigator, Team for Research in Ubiquitous Secure Technology (TRUST), National Science Foundation, \$260,000, 2009-2016.

Principal-Investigator, Incentive Engineering for Network Security, UC MICRO Program and DoCoMo Labs USA, \$93,000, 2008-2009.

Research Gift, Fujitsu Labs of America, \$50,000, 2008.

Principal-Investigator, The 100x100 Project (<http://netecon.berkeley.edu/100x100/>), National Science Foundation ITR Program (ANI-0331659), \$1.0 Million (part of \$7.5 Million Collaborative Research), 2003-2008. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=0331659](http://www.nsf.gov/awardsearch/showAward?AWD_ID=0331659)

Principal-Investigator, The Denali Project (<http://denali.berkeley.edu/>), National Science Foundation ITR Program (ANI-0085879), \$1.5 Million (part of \$5.0 Million Collaborative Research), 2000-2005. [http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=0085879](http://www.nsf.gov/awardsearch/showAward?AWD_ID=0085879)

## PROFESSIONAL ACTIVITIES

### General Chair:

- 10th ACM Conference on E-Commerce (EC), 2009
- 1st Workshop on Economics of Peer-to-Peer Systems (P2PEcon), 2003

### Steering Committee:

- Workshop on the Economics of Networks, Systems, and Computation (NetEcon), 2006 – present

### Program Committee Co-Chairs:

- 1st Workshop on Wearable Security and Privacy (WS&P), 2015
- Joint Workshop on Pricing and Incentives in Networks and Systems (W-PIN+NetEcon), 2014
- 7th ACM Conference on E-Commerce (EC), 2006
- 1st Workshop on Economics of Peer-to-Peer Systems (P2PEcon), 2003

### Program Committees:

- 15th Workshop on Economics and Information Security (WEIS 2016)
- 3rd International Conference on Physiological Computing Systems (PhyCS 2016)
- 2nd International Conference on Physiological Computing Systems (PhyCS 2015)
- IEEE Workshop on User Authentication for Emerging Interfaces, 2015
- Conference on Decision and Game Theory for Security (GameSec 2014)
- Conference on Decision and Game Theory for Security (GameSec 2013)
- Conference on Decision and Game Theory for Security (GameSec 2012)
- 39th Telecommunications Policy Research Conference (TPRC 2011)
- 2nd International ICST Conference on Game Theory for Networks (GameNets 2011)
- 38th Telecommunications Policy Research Conference (TPRC 2010)
- Conference on Decision and Game Theory for Security (GameSec 2010)
- 11th ACM E-Commerce Conference (EC 2010), Senior PC Member
- 19th International Conference on World Wide Web (WWW) 2010
- 11th International Conference on Electronic Commerce (ICEC) 2009
- 9th ACM Conference on E-Commerce (EC) 2008
- 17th International Conference on World Wide Web (WWW) 2008
- 7th International Workshop on Peer-to-Peer Systems (IPTPS) 2008
- Workshop on Economic Models for Distributed Systems (EMDS) 2008
- 2nd IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD) 2007
- 4th Workshop on Grid Economics & Business Models (GECON) 2007
- Workshop on Economic Models and Algorithms for Grid Systems (EMAGS) 2007
- ACM SIGCOMM 2006
- International Conference on Information and Communication Technologies and Development (ICTD) 2006
- 3rd Workshop on Grid Economics & Business Models (GECON) 2006
- 6<sup>th</sup> ACM Conference on E-Commerce (EC) 2005
- 7<sup>th</sup> International IEEE Conference on E-Commerce Technology (CEC) 2005
- 25<sup>th</sup> IEEE International Conference on Distributed Computing Systems (ICDCS) 2005
- 3<sup>rd</sup> Workshop on Economics of Peer-to-Peer Systems (P2PEcon) 2005
- AIS International Conference on Information Systems (ICIS) (Associate Editor for ITS track) 2004
- ACM SIGCOMM Workshop on Practice and Theory on Incentives in Networked Systems (PINS) 2004

2<sup>nd</sup> Workshop on Economics of Peer-to-Peer Systems (P2PEcon) 2004  
Workshop on Information Technology and Systems (WITS) 2003  
IEEE International Workshop on Quality of Service (IWQoS) 2003  
IEEE International Workshop on Quality of Service (IWQoS) 2002

Editorial Board: *International Journal on Information Technology and Decision Making*

Reviewer for: *IEEE/ACM Transactions on Networking, IEEE Transactions on Computing, IEEE Transactions on Multimedia, IEEE Journal on Selected Areas in Communications, IEEE Communications Magazine, ACM Transactions on Computer Systems, ACM Transactions on the Web, Journal of Algorithms, Management Science, Journal of Economics & Management Strategy, Electronic Commerce Research, INFORMS Journal on Computing, Review of Network Economics, Internet Encyclopedia, The Internet Society Journal, Algorithmic Game Theory* (Cambridge University Press), IEEE INFOCOM, ACM SIGCOMM, ACM HotNets, ACM Mobisys.

Service at the National Science Foundation (NSF):

CISE CNS Review Panel, 2013  
CISE CNS Committee of Visitors (CoV), 2009  
CISE CNS Review Panel, 2006  
CISE Advisory Committee, Subcommittee on Middleware Infrastructure, 2000  
CISE ad hoc reviews, various

Jury, Tech-to-Market Innovation Challenge, Orange Silicon Valley and Qualcomm Inc., May 2014.

Vice-Chair, IEEE Society on Social Implications of Technology, Santa Clara Valley Chapter, 1994-1995.

Computing Community Consortium (CCC) Leadership in Science Policy Institute, 2011.

## **SELECTED INVITED PRESENTATIONS**

Invited Talk: **Ubiquitous Biosensing 2036**. National Intelligence Council Conference on Technology and Governance: The Next 20 Years, Berkeley CA, January 2016.

Invited Talk: **Security and Privacy of Neurosensing At Scale**. Workshop on Security and Human Behavior, Washington DC, June 2015.

Invited Talk: **Long-Term Cybersecurity: A Neurosensing Perspective**. Swissnex San Francisco, "Vulnerability in the Connected World", San Francisco CA, May 2015.

Invited Talk: **Biosensing 2020**. Samsung Strategy and Innovation Center, Menlo Park CA, May 2015.

Invited Talk: **Neurosensing at Scale**. AAAI Spring Symposium, "Ambient Intelligence for Health and Cognitive Enhancement", Stanford CA, March 2015.

Invited Talk: **One-Step Two-Factor Authentication with Wearable Bio-Sensors**. Starkey Hearing Research Center, Berkeley CA, December 2014.



Keynote Speaker: **From Passwords to Passthoughts: Usability and Security of Authentication Using Brainwaves**. 7th Symposium on Curriculum Development in Security and Information Assurance (CDSIA 2014), San Jose CA, April 2014.

Invited Speaker: **I Think, Therefore I Am: Usability and Security of Authentication Using Brainwaves**. DARPA Information Science and Technology (ISAT) Workshop on Trusting Networks of Humans and Computers, March 2014.

Featured Speaker: **The Neuro Mobile Wearable Future**. Mobile Marketing Association (MMA) CEO Summit, July 2013.

Keynote Speaker: **Incentive Dynamics in Interdependent Network Security. Or: Buying a Raft and Out-Running a Bear**. 2nd International Conference on Game Theory for Networks (GameNets 2011), April 2011.

Invited Expert, DARPA Information Science and Technology (ISAT) Study on Macroeconomics, Game Theory and Security, January 2011.

Briefer, JASON Summer Study on Science of Cybersecurity, July 2010.

Invited Participant, Future Internet Architecture Summit, October 2009.

Keynote Speaker, 5th IEEE International Conference on Peer-to-Peer Computing, September 2005.

Invited Speaker, Academia Sinica Summer Institute on Peer-to-Peer Computing, August 2004.

## **SELECTED PRESS/MEDIA**

Wall Street Journal, Stay Secure without Passwords, Andrew Blackman, 9/15/2013.

New York Times, Machines Made to Know You, by Touch, Voice, Even by Heart, Somini Sengupta, 9/10/2013.

BBC TV (UK), Could passthoughts replace the password? Sumi Das, 7/4/2013.

Los Angeles Times, Web services speed ahead with ways to bolster customer security, Paresh Dave, 6/17/2013.

Heute (Germany), Wenn nur das Hirn das Passwort kennt, Staff, 5/8/2013.

Metro (UK), Forgotten your password? Don't worry, soon you'll be using passthoughts, David Jenkins, 4/29/2013.

Huffington Post, Brainwave Passwords Not Too Far Off, Staff, 4/26/2013.

CalTV, CalConnect: Brainwaves and Passthoughts, Denesha Williams, 4/24/2013.

CeBit (Germany), Pass-thoughts: Passwörter per Gedankenübertragung eingeben, Staff, 4/24/2013.

PC World, Study shows brainwaves could be security for wearable tech, Antone Gonsalves, 4/21/2013.

Zaiki News (Japan), カリフォルニア大学、脳波をパスワード代わりにする「passthoughts」を開発, Staff, 4/18/2013.

Neuro Gadget, Passthoughts: the future of authentication? Staff, 4/17/2013.

AOL, Brainwave Passwords Not Too Far Off, Staff, 4/17/2013.

Lemond Informatique (France), L'activité cérébrale, le futur des mots de passe? Staff, 4/16/2013.

Slashdot, Passthoughts, Not Passwords: Authentication Via Brainwaves, 4/15/2013.

Popular Science, Your Brain Pattern Could Be Your Password, Rebecca Boyle, 4/15/2013.

CNN International, والحسابات للأجهزة المبرور لكلمات من بدلا الأفكار...قريبا, Staff, 4/15/2013.

KCBS Radio (San Francisco CA), A Password from Your Thoughts, Jeff Bell, 4/14/2013.

Dark Reading, Researchers Analyze Brainwaves To Authenticate Users, Brian Prince, 4/12/2013.

WOGX Fox TV (Gainesville FL), No passwords: logging in with your mind, Joel Waldman, 4/12/2013.

Xinhua (China), 美科學家研究通過生物識別傳感器替代傳統密碼, Staff, 4/12/2013.

Wired UK, Podcast 119: Bitcoin crash, asteroid capture, passthoughts, Nate Lanxon, 4/12/2013.

ABC News, Passthoughts? Brainwave-Based Passwords a Reality, Joanna Stern, 4/11/2013.

WJLA ABC TV (Washington DC), Brain Powered Passwords, Staff, 4/11/2013.

PC Welt (Germany), Passwort der Zukunft wird per Gedankenübertragung eingegeben, Denise Bergert, 4/11/2013.

Taiwan TV, 念力密碼誕生！99美元腦波設備 生物識別安全系統再升級, Staff, 4/11/2013.

Times of India, Forget typing password, your thought is the key, Staff, 4/11/2013.

Daily Cal, Thoughts could be future of security, Jennie Yoon, 4/10/2013.

MSN, 'Pass-thoughts' may be security of the future, Michelle McGuinness, 4/10/2013.

Homeland Security News Wire, Future computers will identify users by thoughts, not passwords, Staff, 4/10/2013.

HLN TV, Oh, hello future: 'Passthoughts' are the new passwords, Jonathan Anker, 4/10/2013.

NBC News, Passwords? What about passthoughts? New login relies on brain signals, Nidhi Subbaraman, 4/10/2013.

PC Magazine, Researchers Look to Replace Passwords With 'Passthoughts', Chloe Albanesius, 4/10/2013.

Government Technology, Will 'Passthoughts' Replace Passwords? Staff, 4/10/2013.

Fox News, Your next password: a passTHOUGHT, Nic Halverson, 4/10/2013.

FOX 5 TV (New York City), No passwords: logging in with your mind, Joel Waldman, 4/10/2013.

Sydney Morning Herald (Australia), Researchers replace passwords with mind-reading 'passthoughts', Camille Bautista, 4/10/2013.

Time Magazine, Passwords May Soon Be Replaced by 'Pass-Thoughts', Fox Van Allen, 4/9/2013.

CNBC, Replace Your Password With Brainwaves? Yes, Really, Cadie Thompson, 4/9/2013.

Mashable, Researchers Replace Passwords With Mind-Reading Passthoughts, Camille Bautista, 4/9/2013.

Discovery News, Your Thought Is the Password, Nic Halverson, 4/9/2013.

Engadget Germany, Authentifizierung mit dem Kopf: Denk dir dein Passwort, Benjamin Weiss, 4/9/2013.

Wired UK, Study: we could ditch passwords in favour of 'passthoughts', Olivia Solon, 4/9/2013.

Dictionary.com, What if a password didn't contain words? Staff, 4/9/2013.

Computerra (Russia), В будущем пароли не нужно будет вводить, о них достаточно будет подумать, Staff, 4/9/2013.

Extreme Tech, Berkeley researchers replace passwords with passthoughts by reading your mind, Sebastian Anthony, 4/8/2013.

Venture Beat, Brain drain: Your thoughts could soon replace passwords, Meghan Kelly, 4/8/2013.

Ubergizmo, Brainwave Sensor Will Validate Log In Credentials Using Only Your Mind, Daniel Perez, 4/8/2013.

TechCrunch, No More Typed Passwords, Berkeley Researchers Develop "Passthoughts", Gregory Ferenstein, 4/8/2013.

Geekosystem, Passwords Are Old News, Unlock Stuff With Your Brain Like a Champion, Glen Tickle, 4/8/2013.

Fast Company, The future in passwords may be all in your mind, Fred Milgrom, 4/8/2013.

CNET, Why bother with passwords when you can have passthoughts? Chris Matyszczyk, 4/8/2013.