

Eva C. Song

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| CONTACT INFORMATION | Equad C307, Olden St. Department of Electrical Engineering Princeton University, NJ 08544 USA <i>U.S. Permanent Resident</i> | <i>Phone:</i> 412-427-7609 <i>E-mail:</i> csong@princeton.edu http://www.princeton.edu/~csong |
| EDUCATION | Princeton University , NJ USA Ph.D. Candidate, Electrical Engineering GPA 3.83/4.0 (expected graduation date: August 2015) M.A. received September 2012 Thesis Advisors: Paul W. Cuff, H. Vincent Poor Carnegie Mellon University , Pittsburgh, PA USA B.S., Electrical and Computer Engineering GPA 3.93/4.0 | September 2010-present August 2007-December 2009 |
| RESEARCH EXPERIENCE | Department of Electrical Engineering, Princeton University Joint Source-Channel Coding <ul style="list-style-type: none">• Studied joint source-channel coding in multi-user communication network• Analyzed joint source-channel coding schemes in rate-distortion based secrecy communication systems Lossy Source Compression <ul style="list-style-type: none">• Studied the use of likelihood encoder in various source coding problems• Studied the fundamental limit of source compression with side information under reliability and secrecy constraints Source Channel Secrecy <ul style="list-style-type: none">• Studied secrecy of Gaussian source compression• Studied the fundamental limit of transmitting messages over noisy broadcast channel under certain reliability and security constraints• Studied source coding limit with presence of eavesdropper and secret key sharing between transmitter and intended receiver using rate-distortion theory Department of Electrical and Computer Engineering, Carnegie Mellon University Research Assistant, full-time <i>Data Storage Systems Center, undergraduate research</i> <ul style="list-style-type: none">• Conducted calculations for an electromagnetic system• Modeled and analyzed dynamic performance of microactuator for application of hard disk drive using COMSOL and MATLAB Damage Detection in Pipeline <i>Signal Processing, undergraduate research</i> <ul style="list-style-type: none">• Studied time reversal theory for damage detection• Implemented time reversal algorithm in MATLAB and performed experimental measurements Thermo-Optical Modeling of Near Field Optical Sources <i>Data Storage Systems Center, undergraduate research</i> <ul style="list-style-type: none">• Modeled and analyzed near field optical sources using COMSOL and MATLAB for application in heat assisted magnetic recording (HAMR) | Oct 2014-present June 2013-present July 2011-June 2013 January-June 2010 Advisor: James Bain September-December 2009 Advisor: José Moura January-June 2009 Advisor: James Bain |
| TEACHING EXPERIENCE | TA COS-126 General Computer Science TA ELE-301 Circuits and Signal Processing TA 18-300 Fundamentals of Electromagnetism TA 18-220 Electrical Engineering | Princeton University Princeton University Carnegie Mellon University Carnegie Mellon University FALL 2012 FALL 2011 FALL 2009 FALL 2008 |

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| PROFESSIONAL EXPERIENCE | <p>Alcatel-Lucent <i>Intern, Bell Labs Research</i> <ul style="list-style-type: none"> • Jointly worked with Communication and Signal Processing group and Optics group on MIMO optical communication security project • Studied and derived fundamental mathematical limits in multimode fiber communication in presence of eavesdropping • Applied theoretical results to physical model and wrote MATLAB code to simulate </p> <p>DAT Group <i>Intern, Software Engineer</i> <ul style="list-style-type: none"> • Developed banking and public transportation applications for smart card and reader using C++ </p> | <p>NJ, USA June-September 2012</p> <p>Beijing, China June-August 2008</p> |
| MENTORING EXPERIENCE | <p>Department of Electrical Engineering, Princeton University Side Channel Attack in Cache-Timing <ul style="list-style-type: none"> • Mentored senior undergraduate student in electrical engineering conducting research in analysis of cache-timing attack </p> | |
| PUBLICATIONS | <p>E. C. Song, P. Cuff and H. V. Poor, Joint Source-Channel Secrecy Using Hybrid Coding, IEEE International Symposium on Information Theory, Hong Kong. June 2015</p> <p>E. C. Song, P. Cuff and H. V. Poor, A Rate-Distortion Based Secrecy System with Side Information at the Decoders, IEEE 52nd Annual Allerton Conference on Communication, Control, and Computing, IL. October 2014</p> <p>E. C. Song, P. Cuff and H. V. Poor, The Likelihood Encoder for Lossy Compression, submitted to IEEE Trans. on Information Theory, August 2014</p> <p>E. C. Song, P. Cuff and H. V. Poor, The Likelihood Encoder for Lossy Source Compression, IEEE International Symposium on Information Theory, Honolulu, HI. June 2014</p> <p>E. C. Song, E. Soljanin, P. Cuff, H. V. Poor and K. Guan, Rate-Distortion-Based Physical Layer Secrecy with Applications to Multimode Fiber, IEEE Trans. on Communications, vol.62, no.3, pp.1080,1090, March 2014</p> <p>P. Cuff and E. C. Song, The Likelihood Encoder for Source Coding, IEEE Information Theory Workshop, Seville, Spain. September 2013</p> <p>E. C. Song, P. Cuff and H. V. Poor, A Bit of Secrecy for Gaussian Source Compression, IEEE International Symposium on Information Theory, Istanbul, Turkey. July 2013</p> <p>K. C. Guan, E. C. Song, E. Soljanin, P. J. Winzer and A. M. Tulino, Physical Layer Security in Space-Division Multiplexed Fiber Optic Communications, IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA. November 2012</p> <p>C. Schieler, E. C. Song, P. Cuff and H. V. Poor, Source-Channel Secrecy with Causal Disclosure, IEEE 50th Annual Allerton Conference on Communication, Control, and Computing, IL. October 2012</p> | |
| OTHER PRESENTATIONS | <p>E. C. Song, P. Cuff and H. V. Poor, The Likelihood Encoder with Applications to Lossy Compression and Secrecy, Information Theory and Applications Workshop, La Jolla, CA. February 2015</p> <p>E. C. Song, P. Cuff and H. V. Poor, A Bit of Secrecy for Gaussian Source Compression, North American School of Information Theory, Purdue University, West Lafayette, IN. June 2013</p> | |

E. C. Song, E. Soljanin, K. C. Guan and P. J. Winzer, Imperfect Information Theoretic Secrecy for Multimode Fiber, DIMACS Workshop on Information-Theoretic Network Security, Rutgers, NJ. November 2012

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| HONORS AND AWARDS | Wu Prize for Excellence, Princeton University | 2014 |
| | Eta Kappa Nu, Electrical and Computer Engineering Honor Society | Since 2008 |
| | Tau Beta Pi, Engineering Honor Society | Since 2008 |
| | Graduated with Honor, Carnegie Mellon University | May 2010 |
| | Dean's List, Carnegie Mellon University | 2007-2009 |

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| SERVICES | Society of Women Engineers Conference (SWE 14) | Los Angeles, CA |
| | <i>Recruiter</i> | Oct 2014 |
| | <ul style="list-style-type: none">• Volunteered to recruit for Princeton University School of Engineering and Applied Science | |
| | Conference on Information Sciences and Systems (CISS) | Princeton, NJ |
| | <i>Volunteer</i> | March 2014, 2012 |
| | <ul style="list-style-type: none">• Volunteered to help with technical support during conferences | |
| COMPUTER SKILLS | Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt) | Princeton, NJ |
| | <i>Volunteer</i> | May 2011 |
| | <ul style="list-style-type: none">• Volunteered to help with registration and technical support during conference | |
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| COMPUTER SKILLS | <ul style="list-style-type: none">• Languages: C/C++, Java, Python, MATLAB, R, HTML• OS: Linux/Unix, MacOS X, Windows, iOS, Android |
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| REFERENCES | Prof. Paul Cuff | |
| | Department of Electrical Engineering, Princeton University | |
| | cuff@princeton.edu | |
| | 609-258-7946 | |
| | Prof. Vincent Poor | |
| | Dean, School of Engineering and Applied Science, Princeton University | |
| | poor@princeton.edu | |
| | 609-258-1816 | |
| | Prof. Sergio Verdú | |
| Department of Electrical Engineering, Princeton University | | |
| verdu@princeton.edu | | |
| 609-258-5315 | | |