

Debin Liu

PhD in Informatics at Indiana University
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OBJECTIVE

Seeking a full time position to apply my research and analytical skills in Information Security to help secure systems and applications: reviewing actual and perceived security vulnerabilities, identifying consumer experience trouble spots, analyzing and detecting online frauds, assessing risk and outlining remediation strategies

QUALIFICATION SUMMARY

- Strong research capabilities on information security behavior and user experience
- Excellent information risk modeling, assessment, and compliance management skills
- Strengthened quantitative and statistical fraud analysis skills
- Excellent interpersonal, organizational and time management skills

EDUCATION

PhD in Informatics August 2005 - August 2010
Major in Information Security
Minor in Finance and HCI
Dissertation title: *Incentive, Behavior, and Information Security Management*
Advisor: L. Jean Camp
Indiana University, Bloomington, IN, U.S.

MS in Physics August 2003 - August 2005
Texas A&M University, College Station, TX, U.S.

BS in Modern Physics September 1999 - July 2003
University of Science & Technology of China, Hefei, China

EMPLOYMENT

Research Intern June 2009-September 2009
Payment Research Group at Federal Reserve Bank of Kansas City

- Designed internal control mechanism to protect payment transaction date
- Analyzed payment card fraud survey data
- Research on payment card customer fraud experience and behaviors
- Received trainings of bank examination

Doctoral Research Assistant August 2006-present
School of Informatics at Indiana University

- Research on incentive-based access control to manage operational risk
- Modeling and analysis of insider threats
- Usable privacy and user-centered security design
- Human-subject studies of security behaviors and experience
- Information security risk modeling and analysis

Associate Instructor August 2006-May 2007
School of Informatics at Indiana University

- Taught undergraduate courses in Computer Science

Teaching Assistant August 2003-August 2005
Department of Physics at Texas A&M University

- Taught and assisted with various undergraduate courses in Physics

SELECTED PROJECTS

Data Access Model in Banking Organizations

- *Problem:* An effective data access control is a critical component of bank management and a foundation for the safe and sound operation of banking organizations.
- *Problem solving:*
 - Proposed an payment-based policy model of internal control;
 - Used incentive contract to induce employees to provide appropriate risk control efforts;
 - Developed a learning model of users' behavior history;
 - Completed economic evaluation and analysis.

Mitigation of Inadvertent Insider Threats with Incentives

- *Problem:* Inadvertent insiders are individuals who do not have malicious intent but behave in a manner that creates organizational risk. They have long been identified as a grave security threat to organizations.
- *Problem solving:*
 - Modeled inadvertent insider threats using incentive engineering;
 - Designed a risk budget mechanism to limit risk and regulate users' risk behaviors;
 - Conducted human-subject experiments and game theoretic analysis.

Game Theoretic Modeling and Analysis of Malicious Insiders

- *Problem:* Malicious insiders are among the most serious and difficult threats to organizations' information assets.
- *Problem solving:*
 - Built a game theoretic modeling of the problem of malicious insider;
 - Analyzed insider threats and produced optimal defend strategy;
 - Completed two real-world case studies.

Evaluation and Analysis of Proof-of-Work Anti-Spam Mechanism

- *Problem:* Proof-of-Work is a set of cryptographic mechanisms to increase the cost of initiating a connection. It has been proposed as a candidate solution to the problem of spam, DDoS and other forms of resources abuse.
- *Problem solving:*
 - Constructed and evaluated a mathematical model of Proof-of-Work grounded in cryptography and economics;
 - Proposed to mitigate the problem of spam using Proof-of-Work by combining it with reputation systems.

Design and Analysis of Computer Risk Communication

- *Problem:* Risk communication plays an important role in informing risks behavior. It's always a challenge to design effective risk communication.
- *Problem solving:*
 - Implemented mental model study to analyze computer risk communication;
 - Built a Flash/PHP/MySQL Server-based online experiment system using pile sorting for data collection.

Evaluation of Phishing Education

- *Problem:* Phishing is a scam conducted for the purposes of information theft. Phishing "IQ tests" are believed to help individuals assess their vulnerability to phishing scams.
- *Problem solving:*
 - Examined the change on a phishing "IQ test" before and after phishing education;
 - Drew statistical conclusion that suggests phishing education to improve performance fails.

COMPUTER SKILLS

Programming Languages: *C++*, *Perl*, *R*, *PHP*, *JavaScript*

Software Specialized: *Matlab*, *SPSS*

Operating Systems: *Windows*, *Linux*, *MacOS*

Familiar with MS office products

PUBLICATIONS

Peer Reviewed Journals

Debin Liu, L. Jean Camp, XiaoFeng Wang and Lusha Wang, "Using Budget-Based Access Control to Manage Operational Risks Caused by Insiders", *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, Vol. 1, No. 1, pp. 29-45.

Debin Liu, XiaoFeng Wang and L. Jean Camp, "*Game Theoretic Modeling and Analysis of Insider Threats*", *International Journal of Critical Infrastructure Protection*, Volume 1, December 2008, pp. 75-80.

Debin Liu, "*The Economics of Proof-of-Work*". *I/S: A Journal of Law and Policy for the Information Society*, Winter 2007.

Alexey Belyanin, Feng Xie, Debin Liu, Federico Capasso and Mariano Troccoli, "*Coherent nonlinear optics with quantum cascade structures*". *Journal of Modern Optics*, Vol. 52, No. 16, November 2005.

Peer Reviewed Conferences

Debin Liu, L. Jean Camp, XiaoFeng Wang, and Lusha Wang, "Using Budget-Based Access Control to Manage Operational Risks Caused by Insiders". MIST10, Morioka, Iwate, Japan, June 2010.

Debin Liu, L. Jean Camp and XiaoFeng Wang, "*Mitigating Inadvertent Insider Threats with Incentives*". FC09, Barbados, February 2009.

Debin Liu, L. Jean Camp and XiaoFeng Wang, "*Game Theoretic Modeling and Analysis of Insider Threats*". IFIP WG 11.10, Arlington, Virginia, March 2008.

Farzaneh Asgapour, Debin Liu and L. Jean Camp, "*Mental Models of Computer Security Risks*". WEIS 2007, Pittsburgh, PA, 7-8 June 2007.

Debin Liu, Farzaneh Asgharpour and L. Jean Camp, "*Risk Communication in Security using Mental Models*". Usable Security 07, Tobago, February 2007.

Debin Liu and L. Jean Camp, "*Proof of Work Can Work*". WEIS 2006, Cambridge, MA, 26-28 June 2006.

L. Jean Camp and Debin Liu, "*Proof of Work {cannot, can, does currently} Work*", TPRC, Arlington, VA, September 30 2007.

Vivek Anandpara, Andrew Dingman, Markus Jakobsson, Debin Liu and Heather Roinestad, "*Phishing IQ Tests Measure Fear, Not Ability*", Usable Security 07, Tobago, February 2007.

Presentations

"Using Budget-Based Access Control to Manage Operational Risks Caused by Insiders". MIST10, Morioka, Iwate, Japan, June 2010.

"*Information Security and Risk Management using Incentive Contract*", Federal Reserve Bank of Kansas City, Kansas City, MO, September 2009.

“Analysis and Mitigation of Insider Threats”, Federal Reserve Bank of Kansas City, Kansas City, MO, June 2009.

“Mitigating Inadvertent Insider Threats with Incentives”, Financial Cryptography and Data Security 09, Barbados, February 2009.

“Game Theoretic Modeling and Analysis of Insider Threats”, The Second Annual IFIP WG 11.10 International Conference on Critical Infrastructure Protection, Arlington, Virginia, March 2008.

“Game Theoretic Fight against Insider Threat”, The Fourth Midwest Security Workshop, Chicago, Illinois, October 2007.

“Proof of Work can Work”, The Fifth Workshop on the Economics of Informatics Security, Cambridge, U.K., June 2006.

HONORS AND ACTIVITIES

Program Committee Member: 2nd International Workshop on Managing Insider Security Threats (MIST 2010), Morioka, Iwate, Japan, June 15, 2010.

External Reviewer for International Journal of Critical Infrastructure Protection, August 2009.

Research Mentor: led 2 undergraduate students on security research to improve risk communication, Indiana University, Spring 2009-Spring 2010.

Graduate Assistant: 30 hours tuition fee remission with monthly stipend, Indiana University, August 2005-present.

HCI Designer: led focus group, conducted contextual inquiry and designed visualization interface to help the Indiana Information Referral System, September 2007-May 2008.

Vice President of Chinese Students and Scholars Association at Texas A&M University, September 2003-August 2004.

Chairman of Student Association at University of Sci.&Tech. of China, September 1999-August 2000.

First Prize of Olympic Physics Contest of Sichuan Province, 1998.

Second Prize of National Olympic Physics Competition, 1998.