

# Anh Le

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CONTACT INFORMATION Donald Bren School of Information and Computer Sciences University of California, Irvine Irvine, CA 92697 Mobile: +1 (424) 210-1241 Email: anh.le@uci.edu Website: <http://www.ics.uci.edu/~anhml>

INTERESTS My interests are in the broad areas of networking, security, and privacy. I am particularly interested in smartphones and network coding. I enjoy applying tools from cryptography and machine learning to network security problems as well as designing and implementing systems.

EDUCATION **University of California, Irvine, CA, USA**  
*Ph.D. in Computer Science* *Sep. 2008 – present*

- Dissertation: “Defense against Pollution Attacks in Network Coding”.
- Advisor: Prof. Athina Markopoulou.
- GPA: 4.0/4.0.

**University of Waterloo, Waterloo, ON, Canada**  
*M.Math. in Computer Science* *Sep. 2006 – Aug. 2008*

- Dissertation: “On Optimizing Traffic Distribution for Clusters of Network Intrusion Detection and Prevention Systems”.
- Advisors: Prof. Raouf Boutaba and Prof. Ehab Al-Shaer.
- GPA: 90.5/100.0.

**University of Manitoba, Winnipeg, MB, Canada**  
*B.S. in Computer Science – Mathematics* *Sep. 2002 – May 2006*

- Graduated with First Class Honours.
- Four consecutive years in Dean’s Honour List.
- GPA: 4.3/4.5.

HONOURS AND DISTINCTIONS **Awards received at University of California, Irvine**

- IEEE Security and Privacy and USENIX Security Student Grants (2010 and 2009).
- Two-Year Dean Fellowship (2008).
  - For excellent academic standing students who enter the Ph.D. program in Computer Sciences.

**Awards received at University of Waterloo**

- Entrance Scholarship (2006).
  - For newly accepted students of the Master of Mathematics program.

**Awards received at University of Manitoba**

- Manitoba Graduate Scholarship (2006) (declined).
  - For excellent academic standing students who enter graduate programs at the University of Manitoba.
- Philosophia Mathematics Prize in Applied Mathematics (2005).
  - The *best* student in third year Applied Mathematics.
- Agnes Stewart Hart Award in Mathematics (2005).
  - High standing in honours Mathematics program by a third year degree student in the Faculty of Science.
- Honours Mathematics Award (2004).
  - Completion of the second year in honours Mathematics program with the *highest* academic standing.
- Isbister Scholarship in Science (2004).
  - *Highest* standing in the second year in Science.
- Dr. Maxwell S. Rady Scholarship (2004).
  - *Highest* standing in the second year in Science.
- Dr. A. W. Hogg Undergraduate Scholarship (2004).
  - High standing in the Faculty of Science.
- U Manitoba Student Union Scholarship (2004 and 2003).
  - Excellence in academic achievement (top 5%).
- Morley Oretzki Memorial Scholarship (2003).
  - *Highest* standing in General Physics 1 and 2.

**Journal Papers**

- [J2] A. Le and A. Markopoulou, “Cooperative Defense Against Pollution Attacks in Network Coding Using SpaceMac,” to appear in *IEEE JSAC on “Cooperative Networking Challenges and Applications,”* 2011.
- [J1] F. Soldo, A. Le, and A. Markopoulou, “Blacklisting Recommendation System: Using Spatio-Temporal Patterns to Predict Future Attacks,” *IEEE JSAC on “Forensics for Communications and Networking,”* vol. 29, no. 7, pp. 1423–1437, August 2011.

**Peer-Reviewed Conference Papers**

- [C11] A. Le and A. Markopoulou, “NC-Audit: Auditing for Network Coding Storage,” accepted to *IEEE International Symposium on Network Coding (NetCod)*, Cambridge, MA, June 2012.
- [C10] A. Le, L. Keller, C. Fragouli, and A. Markopoulou, “MicroPlay: A Networking Framework for Local Multiplayer Games,” accepted to *ACM SIGCOMM Workshop on Mobile Gaming (MobiGames)*, Helsinki, Aug. 2012.
- [C9] L. Keller, A. Le, B. Cici, H. Seferoglu, C. Fragouli, and A. Markopoulou, “MicroCast: Cooperative Video Streaming on Smartphones,” accepted to *ACM International Conference on Mobile Systems (MobiSys)*, Low Wood Bay, Lake District, June 2012.
- [C8] A. Le and A. Markopoulou, “On Detecting Pollution Attacks in Inter-Session Network Coding,” in *IEEE International Conference on Computer Communications (INFOCOM)*, Orlando, FL, Mar. 2012, pp. 343–351.
- [C7] A. Le and A. Markopoulou, “TESLA-Based Defense Against Pollution Attacks in P2P Systems with Network Coding,” in *IEEE International Symposium on Network Coding (NetCod)*, Beijing, July 2011, pp. 61–67.
- [C6] A. Le, A. Markopoulou, and M. Faloutsos, “PhishDef: URL Names Say It All,” in *IEEE International Conference on Computer Communications (INFOCOM) – Mini Conference*, Shanghai, Apr. 2011, pp. 191–195.
- [C5] A. Le and A. Markopoulou, “Locating Byzantine Attackers in Intra-Session Network Coding using SpaceMac,” in *IEEE International Symposium on Network Coding (NetCod)*, Toronto, ON, June 2010, pp. 1–6.
- [C4] F. Soldo, A. Le, and A. Markopoulou, “Predictive Blacklisting as an Implicit Recommendation System,” in *IEEE International Conference on Computer Communications (INFOCOM)*, San Diego, CA, Mar. 2010, pp. 1640–1648.  
\* This work appeared in the MIT Technical Review, Slashdot, Dark Reading, and ACM Tech News.
- [C3] A. Le, E. S. Al-Shaer, and R. Boutaba, “Correlation-Based Load Balancing for Network Intrusion Detection and Prevention Systems,” in *ACM International Conference on Security and Privacy in Communication Networks (SecureCom)*, Istanbul, Sep. 2008, pp. 1–10.
- [C2] A. Le, E. S. Al-Shaer, and R. Boutaba, “On Optimizing Load balancing of Intrusion Detection and Prevention Systems,” in *IEEE International Conference on Computer Communications (INFOCOM) – Computer Communications Workshops*, Phoenix, AZ, Apr. 2008, pp. 1–6.
- [C1] A. Le and Y. E. Liu, “Fairness in Multi-Player Online Games on Deadline-Based Networks,” in *IEEE Consumer Communications and Networking Conference (CCNC)*, Las Vegas, NV, Jan. 2007, pp. 670–675.

**Invited Papers with Proceedings**

- [V1] H. Seferoglu, L. Keller, B. Cici, A. Le, and A. Markopoulou, “Cooperative Video Streaming on Smartphones,” in *Allerton Conference on Communication, Control, and Computing (Allerton)*, Urbana-Champaign, IL, Sep. 2011, pp. 220–227.

## Posters and Demos

- [D2] L. Keller, A. Le, B. Cici, H. Seferoglu, C. Fragouli, and A. Markopoulou, “Demo – MicroCast: Cooperative Video Streaming on Smartphones,” to be demo at *ACM International Conference on Mobile Systems (MobiSys)*, Low Wood Bay, Lake District, June 2012.
- [D1] L. Keller, A. Le, B. Cici, H. Seferoglu, C. Fragouli, and A. Markopoulou, “MicroCast: Cooperative Video Streaming on Smartphones,” demo at *ACM International Workshop on Mobile Computing Systems and Applications (HotMobile)*, San Diego, CA, Feb. 2012.

## PATENTS

- [P5] A. Le, L. Keller, A. Markopoulou, C. Fragouli, “MicroPlay: a Networking Framework for Mobile Games,” to be filed by UC Irvine and EPFL, 2012.
- [P4] L. Keller, A. Le, B. Cici, H. Seferoglu, A. Markopoulou, C. Fragouli, “MicroCast: a Networking Framework for Cooperative Applications on Smartphones,” to be filed by UC Irvine and EPFL, 2012.
- [P3] A. Le and A. Swerdlow, “Browser Extension Control Flow Graph For Determining Sensitive Paths,” US patent filed by Google Inc., 2011.
- [P2] A. Le and A. Swerdlow, “Browser Extension Control Flow Graph Based Taint Tracking,” US patent filed by Google Inc., 2011.
- [P1] F. Soldo, A. Le, and A. Markopoulou, “Predictive Blacklisting as an Implicit Recommendation System,” US patent filed by UC Irvine, 2010.

## RESEARCH AND WORK EXPERIENCE

### **Google Inc.**, Mountain View, California, USA

*Software Engineer Intern*

*June 2011 – Sept. 2011*

- Designed and implemented in Java and Antlr grammar a static analysis tool to analyze Chrome extensions, leading to an automatic construction and visualization of control flow graphs of extensions’ JavaScripts.

### **University of California, Irvine**, California, USA

*Graduate Research Assistant*

*Sep. 2008 – present*

- Designed and implemented in Java a local multiplayer game networking framework for Android. The framework simplifies game development and achieves very low latency (20 ms).
- Designed and implemented in Java a network-coding-based P2P video streaming system for Android, utilizing local cooperation over both Bluetooth and 802.11.
- Designed and implemented in Python and Matlab a phishing detection system based on online learning, achieving 97% classification accuracy.
- Designed and implemented in Matlab a recommendation system that produces highly predictive firewall blacklists, improving the prediction accuracy by 70% over prior arts.
- Designed and implemented in Java and C++ a provably secure homomorphic MAC scheme to detect and locate pollution attackers in network coding.

### **University of Waterloo**, Ontario, Canada

*Graduate Research Assistant*

*Sep. 2006 – Aug. 2008*

- Designed and implemented in Java an intelligent load-balancer for a cluster of intrusion detection systems.

### **University of Manitoba**, Manitoba, Canada

*Undergraduate Research Assistant*

*Jan. 2008 – May 2008*

- Designed strategies to achieve fairness in multi-player online games on dead-line based network and developed a simulator in Java to evaluate the strategies.

## TEACHING EXPERIENCE

### **University of California, Irvine**, California, USA

*Graduate Reader and Teaching Assistant*

*Sep. 2008 – May 2011*

- ICS 51 - Computer Organization: Fall ’08, Spring ’09, Fall ’09 (~ 50 students).
- ICS 132, EECS 148 - Computer Networks: Winter ’10, Spring ’11 (~ 50 students).
- ICS 133, 233 - Advanced Computer Networks: Winter ’09, Spring ’10 (~ 30 students).

**University of Waterloo**, Ontario, Canada

*Graduate Teaching Assistant*

*Sep. 2006 – Aug. 2008*

- CS 247 - Software Abstraction and Specification.
- CS 241 - Foundations of Sequential Programs.
- CS 137 - Programming Principles.

**University of Manitoba**, Manitoba, Canada

*Undergraduate Teaching Assistant (Excellent Evaluation)*

*Jan. 2004 – May 2008*

- 136.130: Linear Algebra.
- 136.150: Introduction to Calculus.
- 136.170: Advanced Calculus.
- 074.126: Introductory Computer Usage.

INVITED TALKS  
AND  
PRESENTATIONS

[T5] “Defense against Pollution Attacks in Network Coding,” presented at

- *UCLA*, Los Angeles, CA, USA, Feb. 2012.
- *Palo Alto Research Center*, Palo Alto, CA, USA, Oct. 2011.
- *Stanford Security Seminar*, Stanford University, Palo Alto, CA, USA, Sep. 2011.

[T4] “TESLA-Based Defense Against Pollution Attacks in P2P Systems with Network Coding,” presented at *IEEE NetCod '11*, Beijing, China, July 2011.

[T3] “PhishDef: URL Names Say It All,” presented at *IEEE INFOCOM '11*, Shanghai, China, April 2011.

[T2] “Locating Byzantine Attackers in Intra-Session Network Coding using SpaceMac,” presented at *IEEE NetCod '10*, Toronto, ON, Canada, June 2010.

[T1] “Fairness in Multi-Player Online Games on Deadline-Based Networks,” presented at *IEEE CCNC '07*, Las Vegas, NV, USA, Jan. 2007.

PROFESSIONAL  
ACTIVITIES

**Reviewer.** IEEE INFOCOM 2010, IEEE INFOCOM 2011, IEEE INFOCOM 2012, IEEE NetCod 2012, IEEE JSAC 2011.

**Webmaster.** IEEE NetCod 2012, Networking Group at UC Irvine.

**Developer.** Developed TravelGrantRP to support travel grant application submission and review.

SOFTWARE

**MicroPlay.** A networking framework written in Java that enables Android phones to establish multi-player game sessions instantaneously and supports highly interactive games.

**MicroCast.** A system written in Java that enables Android phones to cooperatively stream videos. MicroCast entails a framework that allows Android phones to broadcast packets in high speed locally.

**ChromeExtAnalyzer.** A static analysis tool written in Java and Antlr that automatically constructs, visualizes, and traces the control flow graphs of JavaScript source code of Chrome extensions.

**TravelGrantRP (open-source).** A portal developed in PHP and MySQL which supports the submission and review of travel grants applications.

\* Used by ACM IMC '09, '10, '11 and ACM SIGCOMM '09, '10, '11, '12.

**SpaceMac (open-source).** A homomorphic MAC scheme library written in Java and C++ which provides authentication for expanding spaces to protect network coding against pollution attacks.

COMPUTING  
SKILLS

**Programming Languages.** Java (strongest), Matlab, Python, C/C++, Antlr, JavaScript, HTML, CSS (proficient), PHP, Ruby, SQL (prior experience).

REFERENCES

Available upon request.