

# Minas Gjoka

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CONTACT INFORMATION	Associate Project Scientist School of Engineering, Calit2 University of California, Irvine Irvine, CA 92697	mobile: +1 949 943 7440 e-mail: minas.gjoka@gmail.com website: <a href="http://www.minasgjoka.com">http://www.minasgjoka.com</a> <a href="#">Google scholar profile</a>
RESEARCH INTERESTS	Network Measurements and Modeling, Large-scale Data Analysis, Graph Sampling, Design of Networked Systems, Network Security, Urban Informatics	
EDUCATION	<b>University of California, Irvine</b> <i>Ph.D. in Networked Systems</i> <span style="float: right;"><i>June 2008 – Dec. 2010</i></span> <ul style="list-style-type: none"><li>• Dissertation: “Measurement of Online Social Networks”</li><li>• Advisor: Athina Markopoulou</li></ul> <b>University of California, Irvine</b> <i>M.S. in Networked Systems</i> <span style="float: right;"><i>Sept. 2005 – June 2008</i></span> <b>Athens University of Economics and Business</b> <i>B.S. in Computer Science</i> <span style="float: right;"><i>Sept. 2000 – Jan. 2005</i></span> <ul style="list-style-type: none"><li>• Dissertation: “Internet Modeling”</li><li>• Advisor: Martha Sideri</li><li>• Graduated 1st out of 150 students</li></ul>	
PROFESSIONAL EXPERIENCE	<b>University of California, Irvine</b> <span style="float: right;"><b>Irvine, CA</b></span> <i>Associate Project Scientist</i> <span style="float: right;"><i>July 2014 – June 2016</i></span> <ul style="list-style-type: none"><li>• Designed and built <a href="#">AntMonitor</a>, a system that crowd-sources data collection in Android mobile devices. AntMonitor uses a VPN-based approach to collect network traffic in packet level detail within a mobile device. It supports detection and prevention of privacy leaks in real time, monitors network performance (Wi-Fi, 3G/4G) and leverages machine learning techniques to learn traffic profiles at network flow and user granularity for the purposes of anomaly detection.</li><li>• Developed a class of algorithms that constructs simple graphs with a desired graph properties (joint degree and clustering) in close to linear time. Contributed source code to the <a href="#">NetworkX</a> Python package for complex networks.</li><li>• Proposed a novel spectral decomposition approach that infers activities and provide insights on urban environments from spatiotemporal cell phone data (CDR).</li></ul> <i>Postdoctoral Scholar</i> <span style="float: right;"><i>March 2011 – June. 2014</i></span> <ul style="list-style-type: none"><li>• Proposed novel network-based sampling methods that collect representative samples of a massive unknown graph.</li><li>• Developed measurement and data analysis techniques, algorithms, and models in large networks as a means towards understanding and describing their behavior. Introduced estimation techniques to infer the network structure of large graphs under a variety of probabilistic sampling schemes.</li><li>• Designed visualization tools, such as <a href="#">GeoSocialmap</a> that visually represent graphs embedded in geography.</li><li>• Designed a system that uses crowd-sourcing to answer simple day-to-day questions tied to a specific location.</li></ul> <i>Research Assistant</i> <span style="float: right;"><i>Sept. 2007 – Dec. 2010</i></span> <ul style="list-style-type: none"><li>• Built a distributed social graph crawler (using Python) that implements a variety of sampling methods. Collected and analyzed user profile information for tens of millions of users in Facebook and Last.FM.</li></ul>	

- Identified BitTorrent exploits to launch DDoS attacks and executed small proof-of-concept experiments on the Internet. Our insights received publicity from the [New Scientist](#) and [Slashdot](#).
- Designed a novel IP traceback scheme and developed network tomography mechanisms to infer link loss rates in general topologies by leveraging “network coding“ capabilities of computer networks.
- Designed and implemented networked systems addressing scalability challenges.
- Compared the effectiveness of IPFRR mechanisms in the case of unplanned link/router failures.

*Teaching Assistant*

*Jan. 2006 – Dec. 2006*

- Taught undergraduate courses “Computer Networks”, and “Principles of Operating Systems”.

**Adball LLC, Co-Founder and CTO**

**Irvine, CA**

*Jan. 2008 – Apr. 2010*

Co-founded [Adball](#), an online collaboration platform that crowd-sources the concept, content generation, and dissemination of advertising campaigns. Adball won two business plan competitions and served ~ 20K unique users during its six month online presence.

- designed and built platform from scratch using PHP, Javascript, SQL.

**CAIDA/UC San Diego, Research Intern**

**La Jolla, CA**

*summer 2008*

Advisor: KC Claffy

Analyzed a large dataset (~ 2 TB) of network traffic data received at the DNS root nameservers.

- characterized sources of invalid traffic (using Python) and provided recommendations to reduce it.

**Telefonica Research, Research Intern**

**Barcelona, Spain**

*summer 2007*

Advisor: Pablo Rodriguez

Built a peer-to-peer Video-on-Demand system (in C++) that supports forward and backward seeking.

- designed and implemented key mechanisms at the peers and the tracker to achieve seeking within a video with less than five second delay and to reduce the need for an over-provisioned video content server.

**AT&T Labs Research, Research Intern**

**Florham Park, NJ**

*summer 2006*

Advisor: Balachander Krishnamurthy

Analyzed experimental performance analysis of peer-to-peer (BitTorrent, eMule, Gnutella) and client-server (HTTP, FTP) downloading protocols

- wrote software (in Python) that coordinates flash-crowd and random downloads on a testbed of 500 machines scattered worldwide (Planetlab).

## PUBLICATIONS

### Peer-Reviewed Conference Publications

1. B. Cici, M. Gjoka, C. T. Butts, A. Markopoulou,  
On the decomposition of cell phone activity patterns and their connection with urban ecology  
*Mobihoc 2015*
2. M. Gjoka, B. Tillman, A. Markopoulou  
Construction of Simple Graphs with a Target Joint Degree Matrix and Beyond  
*Infocom 2015*
3. M. Gjoka, M. Kurant, A. Markopoulou  
2.5K-Graphs: from Sampling to Generation  
*Proc. of IEEE INFOCOM '13*, Turin, Italy, Apr. 2013 (acceptance rate 17.4%)
4. M. Kurant, M. Gjoka, C. T. Butts, A. Markopoulou  
Walking on a Graph with a Magnifying Glass: Stratified Sampling via Weighted Random Walks  
*Proc. of ACM SIGMETRICS '11*, June 2011 (acceptance rate 14.6%)
5. P. Sattari, M. Gjoka, A. Markopoulou  
A Network Coding Approach to IP Traceback  
*Proc. of IEEE International Symposium on Network Coding '10*, Toronto, Canada, Jun. 2010
6. M. Gjoka, M. Kurant, C. T. Butts, A. Markopoulou  
Walking in Facebook: A Case Study of Unbiased Sampling of OSNs

- Proc. of IEEE INFOCOM '10*, San Diego, CA, Mar. 2010 (acceptance rate 17.5%)
7. M. Gjoka, C. Fragouli, P. Sattari, A. Markopoulou  
Loss Tomography in General Topologies with Network Coding  
In *Proc. of IEEE GLOBECOM '07*, Washington DC, Nov. 2007 (acceptance rate 39.5%)
  8. M. Gjoka, V. Ram, X. Yang  
Evaluation of IP Fast Reroute Proposals  
In *Proc. of IEEE COMSWARE '07*, Bangalore, India, Jan. 2007 (acceptance rate 34.0%)

#### Peer-Reviewed Journal Publications

9. A. Markopoulou, C. Fragouli, P. Sattari, M. Gjoka  
A Network Coding Approach to Loss Tomography  
*IEEE Transactions on Information Theory*, Volume 59, Issue 3, Mar. 2013
10. M. Gjoka, M. Kurant, C. T. Butts, A. Markopoulou,  
Practical Recommendations on Sampling OSN Users by Crawling the Social Graph  
*IEEE Journal on Selected Areas in Communications, Special Issue on Measurement of Internet Topologies*, Volume 29, Issue 9, Oct. 2011
11. M. Gjoka, C. T. Butts, M. Kurant, A. Markopoulou  
Multigraph Sampling of Online Social Networks  
*IEEE Journal on Selected Areas in Communications, Special Issue on Measurement of Internet Topologies*, Volume 29, Issue 9, Oct. 2011
12. A. Spatharis, I. Foudalis, M. Gjoka, P. Krouska, C. Amanatidis, C. H. Papadimitriou, M. Sideri  
Improved Tradeoff-based Models of the Internet  
*Communications of Systemics and Informatics World Network*, Vol. 1, No. 4, pp. 409-414, July 2007

#### Peer-Reviewed Workshop Publications

13. A. Le, J. Varmarken, S. Langhoff, A. Shuba, M. Gjoka, A. Markopoulou  
AntMonitor: A System for Monitoring from Mobile Devices  
*ACM SIGCOMM Workshop on Crowdsourcing and Crowdsharing of Big Internet Data (C2BID) 2015*
14. M. Gjoka, E. Smith, C.T. Butts  
Estimating Clique Composition and Size Distributions from Sampled Network Data  
In *Proc. of IEEE NetSciCom '14 (Infocom workshop)* and on arXiv:cs.SI:1308.3297  
(acceptance rate 41.6%)
15. M. Kurant, M. Gjoka, Y. Wang, Z. W. Almquist, Carter T. Butts, Athina Markopoulou  
Coarse-Grained Topology Estimation via Graph Sampling  
*Proc. of ACM SIGCOMM Workshop on Online Social Networks '12*, Helsinki, Finland, Aug. 2012  
(acceptance rate 37.5%)
16. X. Yang, M. Gjoka, P. Chhabra, A. Markopoulou, P. Rodriguez  
Kangaroo: Video Seeking in P2P Systems  
*Proc. of IPTPS '09*, Boston, MA, Apr. 2009 (acceptance rate 20.0%)
17. M. Gjoka, M. Sirivianos, A. Markopoulou, X. Yang  
Poking Facebook: Characterization of OSN Applications  
In *Proc. of SIGCOMM Workshop on Online Social Networks '08*, Seattle, WA, Aug. 2008  
(acceptance rate 35.0%)
18. K. El Defrawy, M. Gjoka, A. Markopoulou  
BotTorrent: Misusing BitTorrent to Launch DDoS Attacks  
In *Proc. of USENIX Workshop on Steps to Reducing Unwanted Traffic on the Internet '07*, Jun. 2007  
(acceptance rate 33.0%)

#### Invited Conference Publications

19. M. Gjoka, E. Smith, C. T. Butts  
Design-based Estimators for attribute-labeled, low-semidiameter subgraphs  
*34th Sunbelt Network Conference (INSNA)*, St. Pete Beach, FL, Feb. 2014

20. S. Fitzhugh, C. T. Butts, M. Gjoka, M. Kurant, A. Markopoulou  
Link-trace Methods for Enumeration of Node Sets  
*32nd Sunbelt Network Conference (INSNA)*, Redondo Beach, CA, Mar. 2012
21. M. Kurant, M. Gjoka, C. T. Butts, A. Markopoulou  
Link-Trace Sampling for Social Networks: Advances and Applications  
*31st Sunbelt Network Conference (INSNA)*, St. Pete's Beach, FL, Feb. 2011

### Posters and Demos

22. A. Shuba, A. Le, M. Gjoka, J. Varmarken, S. Langhoff, A. Markopoulou  
AntMonitor: A System for Mobile Traffic Monitoring and Real-Time Prevention of Privacy Leaks  
*ACM Mobicom Demo Session 2015*
23. Efficient Construction of 2K+ Graphs  
M. Gjoka, B. Tillman, A. Markopoulou, R. Pagh  
*NetSci '14*, Berkeley, CA, June 2014
24. V. S. K. Pulla, C. S. Jammi, P. Tiwari, M. Gjoka  
QuestCrowd: A location-based question answering system with participation incentives  
*IEEE INFOCOM '13*, Turin, Italy, Apr. 2013 (acceptance rate 56.5%)
25. M. Kurant, M. Gjoka, C. T. Butts, A. Markopoulou  
Star Sampling and its Application to Online Social Networks  
*Network Mapping and Measurement Conference*, Madison, WI, May 2011

### PATENTS

1. A. Shuba, A. Le, E. Alimpertis, M. Gjoka, A. Markopoulou  
AntMonitor: A System for Mobile Network Monitoring and its Applications"  
provisional, May 2016
2. X. Yang, M. Gjoka, P. Rodriguez, P. Chhabra  
Tracker in P2P systems with DVD functionalities  
US Patent 20,120,272,282, Oct. 2012
3. X. Yang, M. Gjoka, P. Rodriguez, P. Chhabra  
Method for downloading segments of a video file in a peer-to-peer network  
US Patent 20,110,191,418, Aug. 2011

### TEACHING EXPERIENCE

#### University of California, Irvine

Teaching Assistant, CS 132 - Computer Networks, Fall 2006  
Teaching Assistant, ICS 143 - Principles of Operating Systems, Spring 2006  
Teaching Assistant, ICS 153 - Computer Networks, Winter 2006  
Grader, ICS 51 - Introduction to Computer Organization, Spring 2007  
Grader, CS 133 - Network Laboratory, Winter 2007  
Grader, ICS 22 - Introduction to Computer Science II, Fall 2005

#### Athens University of Economics and Business

Teaching Assistant, Programming Languages and Compilers, Spring 2004

### COMPUTING SKILLS

Programming Languages: Python (proficient), C/C++, Java, PHP, Matlab (prior experience)  
Web Development: HTML/CSS, Javascript, AJAX, jQuery  
Operating Systems: MS Windows, GNU/Linux, MacOS  
Miscellaneous: databases (MySQL, MS SQL Server), sockets programming (TCP/UDP), multithreading, Bash/Awk scripting, Version Control, Virtualization Systems, L<sup>A</sup>T<sub>E</sub>X

### PROFESSIONAL ACTIVITIES

**Conference Reviews:** IEEE INFOCOM '15 '14 '13 '12 '11 '10, ACM Mobihoc '15 '13, Sigmetrics '15, IEEE/IFIP DSN '15 '13, ACM CoNEXT '13 '12, IEEE NetSciCom '12, USENIX WOSN '10.

**Journal Reviews:** IEEE/ACM Transactions on Networking '14 '13, ACM Transactions on the Web '14, IEEE Transactions on Communications '12, Journal of Social Structure '12, IEEE Transactions on Multimedia

'11 '09, IEEE Network, ACM SIGCOMM Computer Communication Review '10, Elsevier Computer Networks  
'11 '10, Elsevier Computer Communications '15

**TPC Member:** WWW Posters '15 '16.

**Webmaster:** CoNext '16.

COLLABORATIONS AND AFFILIATIONS Recent Collaborators: Carter Butts, Brian Demsky (University of California, Irvine), Blerim Cici (Apple),  
Maciej Kurant (Google), Christina Fragouli (UCLA), Pablo Rodriguez (Telefonica Research).

Graduate Advisor and Postdoctoral Sponsor: Athina Markopoulou.

Thesis Advisor: Yan Wang (Microsoft), Balint Tillman (UC Irvine).

MENTORING PhD Students: A. Shuba (CS), B. Tillman (NetSys), B. Cici (NetSys), E. Smith (Sociology)  
MSc Students: Y. Wang, T. Osterlund, V.S.K. Pulla, C.S. Jammi, P. Tiwari (NetSys)

HONORS AND AWARDS 1<sup>st</sup> and 3<sup>rd</sup> place at the hITEC OCTANe and SYCR entrepreneurship competitions with team Adball Uni-  
versity of California, Irvine CPCC Fellowship 2007-2008  
University of California, Irvine Networked Systems Fellowship 2005-2007  
Travel grants to attend USENIX ATC '07, GLOBECOM '07, NSDI '08, CoNEXT '10