

## THRASYVOULOS SPYROPOULOS (CV & List of Publications)

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**CAREER OBJECTIVE** Seeking an academic position in electrical engineering and/or computer science with emphasis on network theory and system design.

**RESEARCH INTERESTS** Delay-tolerant/challenged wireless networks, social networks analysis, mobility modeling, vehicular communications, networking with directional and smart antennas, capacity limits for wireless networks, cross-layer designs, stochastic optimization, bio-inspired algorithms and modeling, flow-based characterization of traffic/host/anomalies.

**EDUCATION** **UNIVERSITY OF SOUTHERN CALIFORNIA** Los Angeles, CA  
*Department of Electrical Engineering* 2000-2006

**Ph.D. degree in Electrical Engineering, May 2006.** Thesis title: “Efficient Media Access and Routing in Wireless and Delay Tolerant Networks”. The first of part of the thesis concentrates on modeling and improving the performance of ad-hoc and sensor networks using directional and smart antennas. The second part deals with the problem of routing in emerging delay tolerant networks (DTN) and challenged internets that are disconnected for the majority of time.

**Coursework focus on Communications and Networks.** Courses taken include: Network Protocols, Internet Programming, Broadband Network Architectures, Advanced Topics in Computer Networks, Queuing Theory and Performance Modeling, Random Processes, Information Theory, Advanced Computer Architecture, Advanced Operating Systems, Digital Signal Processing, Analysis of Algorithms, Algorithms for Networks.  
**GPA: 3.97/4.0.**

**NATIONAL TECHNICAL UNIVERSITY OF ATHENS** Athens, Greece  
*Department of Electrical and Computer Engineering* 1994-2000

**Diploma in Electrical and Computer Engineering, March 2000.** Broad curriculum in electrical engineering and computer science with emphasis on computer networks, internet programming, communications, electromagnetic theory, antennas and propagation, computer engineering, digital and analog circuits. **GPA: 8.6/10.**

**RESEARCH EXPERIENCE** **SWISS FEDERAL INSTITUTE OF TECHNOLOGY (ETH)** Zurich, Switzerland  
*Communication Systems Group (CSG)* Oct 2007-present

### LECTURER / SENIOR RESEARCHER

The group’s focus is on network security, wireless networks, and autonomous networks. My responsibilities include the supervision of M.Sc. and Ph.D. students working on these topics, coordinating and attracting EU and Swiss internal research projects, and teaching and development of courses on networking-related topics.

**INRIA – SOPHIA ANTIPOLIS** Sophia-Antipolis, France  
*Institute National de Recherche en Informatique et Automatique* Sep 2006 – Sep. 2007

### POST-DOCTORAL RESEARCHER PROJET PLANETE

The team’s research projects spanned several areas, including security protocols for infrastructure-less networks, multimedia group applications and protocols on top of heterogeneous networks and impact of new transmission media on protocols’ performance. My responsibility was to explore efficient communication methods and the application of novel techniques, like network coding, for “challenged networks”. I was also involved in the COST network’s ARCADIA activity on future internet architectures. Finally, my position included teaching and co-supervision of MSc and PhD students.

**UNIVERSITY OF SOUTHERN CALIFORNIA**  
*Department of Electrical Engineering*

Los Angeles, California, USA

**PROJECTS I HAVE WORKED ON:**

Efficient Routing in Delay Tolerant Networks (NSF) Aug 2005-May 2006  
Power Aware Sensing, Tracking, and Analysis (DARPA) Sep 2002-Jul 2004  
Power Aware Computing and Communication for MANETs (DARPA) Jan 2001-Aug 2002

**INSTITUTE OF SCIENCE AND INFORMATION (ISI)**  
*University of Southern California*

Aug-Dec 2000

Active Network Routers: Investigation of the design for a middleware platform supporting active routers for wired and wireless networks.

**NATIONAL TECHNICAL UNIVERSITY OF ATHENS**  
*Telecommunications Lab*

Sep 1999-Apr 2000

*Intelligent signaling for integrated services networks using mobile agents*: Development and simulation of a distributed load-balancing algorithm for Intelligent Signaling Networks (SS7) using Mobile Agents.

**AWARDS /  
GRANTS**

TECHNICAL CHAMBER OF GREECE (TEE) AWARD 1999-2000  
For academic performance in years 1999-2000.

BEST PAPER AWARD IN IEEE SECON 2008. June 2008

Jointly with Amir Krifa and Chadi Barakat, for paper "Optimal Buffer Management Policies for Delay Tolerant Networks".

FULL-TIME RESEARCH SCHOLARSHIP Aug 2000-May 2006

For research work performed on projects supported by DARPA, NSF, and Aerospace Corporation grants. Covering tuition and living expenses (approx. \$30,000-35,000/year.).

**CONFERENCE  
INVOLVEMENT**

CHAIRING AND EDITORSHIPS

- Program Chair for IFIP International Workshop on Self-Organizing Systems (IWSOS), 2009.
- Co-Editor for "Delay Tolerant Networks: Protocols and Applications", Auerbach Publications, CRC Press (to be published early 2010)

TECHNICAL PROGRAM COMMITTEE (TPC) MEMBER

- IEEE INFOCOM conference, 2010
- IEEE Workshop on Dynamic Networks (WDN), 2010, co-located with WiOpt 2010.
- IEEE SECON conference, 2009
- IEEE AOC'08, AOC'09, and AOC'10 workshop, co-located with IEEE WOWMOM.
- IEEE Vehicular Technology Conference (VTC'08 Fall and VTC'09 Spring)
- ACM CHANTS workshop, co-located with ACM Mobicom, Sep. 2008.
- IEEE LANMAN workshop, Sep. 2008
- ACM Mobility Models workshop, co-located with ACM Mobihoc May 2008.
- IWSOS 2008 workshop, Dec. 2008.
- IEEE MediaWin workshop, co-located with ISCC, Jul. 2008

## REFEREING WORK

2000-present

IEEE Transactions on Communications, IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, ACM/Kluwer Journal on Mobile Networks and Applications (MONET), IEEE Journal of Selected Areas in Communications (JSAC), Wireless Communications and Mobile Computing (WCMC) Journal, IEEE INFOCOM conference, ACM/IEEE MobiHoc conference, etc.

**GRANTS/OTHER  
ACTIVITIES**

**NOKIA RESEARCH GRANT** 2009-2010

Funding by Nokia Research, Helsinki, for project *AwareNet*. (for one year, April 2009-April 2010 with an option to extend for another two years.). Provides funding for one Ph.D. student and one Senior Researcher.

**ETH INTERNAL RESEARCH GRANT** 2009-2012

For project "Using Social Networks for Routing in Wireless Self-Organizing Networks". Funding for one Ph.D. student.

**NATIONAL SCIENCE FOUNDATION (NSF) NETS PROPOSAL** 2005

I actively participated in the preparation of an NSF NETS NBD proposal titled "Efficient routing in delay tolerant networks", which was accepted in the summer of 2005. The proposal was based on preliminary research I had conducted with professors Konstantinos Psounis and Cauligi S. Raghavendra on this area and resulting publications.

**ARCADIA ACTIVITY ON FUTURE INTERNET ARCHITECTURES** 2006-2007

Participating in the ARCADIA activity on Future Internet Architectures, a part of the European Union's COST network (URL: <http://www.cost.esf.org/index.php?id=989>). The objective of this strategic activity is to bring together the strongest networking research groups in Europe, in order to define the most important areas in which disruptive and incremental research on the Internet of the future should be conducted.

**TEACHING  
EXPERIENCE/  
COURSE**

**SWISS FEDERAL INSTITUTE OF TECHNOLOGY (ETH)** Fall 2007, 2008, 2009  
**COMMUNICATION SYSTEMS GROUP (CSG)**

**DEVELOPEMENT**

Lecturer for *Advanced Topics in Communication Networks (ATCN)*, Fall 2007, Fall 2008. This is an M.Sc. level elective course covering topics from wired and wireless networks (jointly taught with Dr. Merkouris Karaliopoulos), such as future Internet architectures and challenges, mesh networks, delay tolerants, social networks, and others. The students are required to read and present recent research papers on the topics, solve homework sets, and pass a final oral examination. The material and structure of the course has been re-developed jointly with Dr. Merkouris Karaliopoulos since Fall 2008.

**INRIA, SOPHIA-ANTIPOLIS** Spring 2007  
**MASTER'S IN NETWORKS AND DISTRIBUTED SYSTEMS**

I have taught a course on Challenged Networks and Architectures for the Master's program in Networks and Distributed Systems taught jointly at the University of Nice and Eurecom. This is a research-oriented, advanced networking course that I have personally developed. It addresses various modeling and protocol issues for emerging wireless networks, and consists of 18-hours of lectures and a final examination. (responsible of MSc. program: Philippe Nain).

**UNIVERSITY OF SOUTHERN CALIFORNIA**  
**COMPUTER SCIENCE DEPARTMENT SEMINAR SERIES**

Fall 2004

Covered the topic of "Routing in Delay Tolerant Networks". This seminar series was organized by the Networking groups of the departments of Computer Science and Electrical Engineering. Speakers were invited to give seminars on various modern research topics in the broad area of networking.

**ADVANCED TOPICS IN COMPUTER NETWORKS COURSE**

Spring 2004

Covered the topic of "Capacity of Wireless Networks" in the upper level graduate course "Advanced Topics in Computer Networks". (Course taught by Prof. Konstantinos Psounis).

**STUDENT  
SUPERVISION**

ANDREEA PICU (PH.D.)

*Sep. 2008 – present (1<sup>st</sup> year)*

Topic: Using Social Networks for Data Dissemination in Wireless Self-Organized Networks  
Accomplishments: article at Bionetics 2009

DOMINIK SCHATZMANN (PH.D.)

*Jan. 2008 – present (1<sup>st</sup> year)*

Topic: Monitoring Spam and BotNet Behavior using Network Flow Data  
Co-supervisor: Dr. Wolfgang Muhlbauer  
Accomplishments: article at PAM 2009

THEUS HOSSMANN (PH.D.)

*Apr. 2008 – present (2<sup>nd</sup> year)*

Topic: Efficient Dynamic Graph Models for Representing Opportunistic Node Communications  
Co-supervisor: Dr. Franck Legendre  
Accomplishments: articles at IEEE Infocom 2009, 2010

SIMON HEIMLICHER (PH.D.)

*Jan. 2008 – present (3<sup>rd</sup> year)*

Topic: Hop-by-Hop Transport Protocols for Partially Connected Wireless Networks  
Co-supervisor: Prof. Hanoch Levy, Dr. Merkouris Karaliopoulos  
Accomplishments: article at IEEE Infocom 2009

NIKLAUS FREY (M.SC.)

*Sep. 2008 – present*

Master Thesis: Design and Implementation of a Multi-hop Protocol for Vehicular Intersection Assistance  
Joint project: ETH – BMW Munich

LEO DEN HARTOG (M.SC.)

*Jan. 2008 – Jun 2008*

Semester Thesis: Using Social Networks for Unicast DTN Routing

AMIR KRIFA (M.SC.)

*May. 2007 – Jan 2008 (at INRIA, Sophia-Antipolis)*

Topic: Optimal Buffer Management Policies for Delay Tolerant Networks  
Co-supervisor: Dr. Chadi Barakat  
Accomplishments: Best paper award at IEEE Secon 2008, article at AOC'08 workshop.

**PUBLICATIONS**

PEER-REVIEWED JOURNALS

*(around 1000 citations according to google scholar, Jan 2010)*

- T. Spyropoulos, T. Turletti, and K. Obraczka, "Routing in Delay Tolerant Networks Comprising Heterogeneous Populations of Nodes," in *IEEE Transactions on Mobile Computing*, vol.8, no.8, 2009.
- W. J. Hsu, T. Spyropoulos, K. Psounis, and A. Helmy, "A Realistic Mobility Model for Time-Variant User Mobility in Wireless Networks," in *ACM/IEEE Transactions on Networking*, vol.15, no.8, 2009.
- D. Schatzmann, M. Burkhart, T. Spyropoulos: "Inferring Spammers in the Network Core," to appear in *Springer-Verlang Lecture Notes in Computer Science (LNCS)*, (from PAM'09), 2009
- T. Spyropoulos, and C. S. Raghavendra, "Efficient Media Access using Adaptive Array Antennas," to appear in *Ad Hoc Networks*, Elsevier, 2009.
- T. Spyropoulos, K. Psounis, and C. S. Raghavendra, "Efficient Routing in Intermittently Connected Mobile Networks: The Multi-copy Case," *ACM/IEEE Transactions on Networking*, Feb 2008. (117 citations)
- T. Spyropoulos, K. Psounis, and C. S. Raghavendra, "Efficient Routing in Intermittently Connected Mobile Networks: The Single-copy Case," *ACM/IEEE Transactions on Networking*, Feb. 2008.
- T. Spyropoulos, A. Jindal, and K. Psounis, "An Analytical Study of Fundamental Mobility Properties for Encounter-based Protocols," *International Journal of Autonomous and Adaptive Communications Systems (IJAACS)*, vol.1, no.1, 2008. (10 citations)

- A. Spyropoulos, C. S. Raghavendra, and V. Prasanna, "A Distributed Algorithm for Waking-up in Heterogeneous Sensor Networks," *Springer-Verlag Lecture Notes in Computer Science (LNCS) 2634* (from IPSN'03), 2003.
- G.Parissidis, M. Karaliopoulos, T. Spyropoulos, B. Plattner, "Interference-aware Routing in Wireless Multihop Networks, pending revisions, *IEEE Transactions on Mobile Computing*.

#### BOOK CHAPTERS AND INVITED PAPERS

- G.Parissidis, M. Karaliopoulos, R. Baumann, T. Spyropoulos, B. Plattner, "Book Chapter: Routing Metrics for Wireless Mesh Networks," in *Springer's Handbook on Wireless Mesh Networks*, Fall 2008.
- Thrasylvoulos Spyropoulos, Serge Fdida, and Scott Kirkpatrick, "Future Internet: Fundamentals and Measurement," (invited) in *ACM SIGCOMM Computer Communications Review Magazine (CCR)*, Apr. 2007. (5 citations)

#### PEER-REVIEWED CONFERENCES AND WORKSHOPS:

- Theus Hossmann, Thrasylvoulos Spyropoulos, and Franck Legendre, "Know Thy Neighbor: Towards Optimal Mapping of Contacts to Social Graphs for DTN Routing," to appear in *IEEE INFOCOM 2010*, San Diego, CA, March 2009. (acceptance = 19%)
- Theus Hossmann, Franck Legendre, Thrasylvoulos Spyropoulos, "From Contacts to Graphs: Pitfalls in Using Complex Network Analysis for DTN Routing," in *Proceedings of IEEE International Workshop on Network Science For Communication Networks (NetSciCom 09)*, co-located with *INFOCOM 2009*, Rio de Janeiro, Brazil, April, 2009
- Andreea Picu and Thrasylvoulos Spyropoulos, "Minimum Expected \*-cast Time in DTNs," (invited paper) in *Proceedings of BIONETICS 2009*, Avignon, France, Dec. 2009.
- Simon Heimlicher, Hanoch Levy, Merkouris Karaliopoulos, and Thrasylvoulos Spyropoulos, "Leveraging Partial Paths in Partially-connected Networks," in *IEEE INFOCOM 2009*. (acceptance = 19%)
- Dominik Schatzmann, Martin Burkhart, Thrasylvoulos Spyropoulos: "Inferring Spammers in the Network Core," in *Passive and Active Measurement (PAM) Conference*, Apr. 2009. (acceptance = 27%)
- Amir Krifa, Chadi Barakat, Thrasylvoulos Spyropoulos, "Optimal Buffer Management Policies for Delay Tolerant Networks," *IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON 2008)*, June 2008. (acceptance = 20%, best paper award) (18 citations)
- G.Parissidis, M. Karaliopoulos, M. May, T. Spyropoulos, B. Plattner, "Interference in Wireless Multihop Networks: A Model and its Experimental Evaluation," *IEEE WoWMoM*, June 2008. ("noteworthy contribution").
- Amir Krifa, Chadi Barakat, Thrasylvoulos Spyropoulos, "An Optimal Joint Scheduling and Drop Policy for Delay Tolerant Networks", *IEEE WoWMoM Workshop on Autonomic and Opportunistic Communications (AOC'08)*, June 2008. (3 citations)
- W. J. Hsu, T. Spyropoulos, K. Psounis, and A. Helmy, "Modeling Time-variant User Mobility in Wireless Mobile Networks," in *Proceedings of IEEE INFOCOM*, May 2007. (17% acceptance rate) (56 citations)
- T. Spyropoulos, K. Psounis, and C. S. Raghavendra, "Spray and Focus: Efficient Mobility-Assisted Routing for Heterogeneous and Correlated Mobility," in *Proceedings of IEEE PERCOM*, workshop on Intermittently Connected Mobile Networks (ICMAN), March 2007. (50 citations)
- T. Spyropoulos, T. Turletti, and K. Obraczka, "Utility-based Message Replication for Intermittently Connected Heterogeneous Networks," in *Proceedings of IEEE WoWMoM workshop on Autonomic and Opportunistic Communicatios (AOC)*, June 2007. (5 citations)
- T. Spyropoulos, K. Psounis, and C. S. Raghavendra, "Performance Analysis of Mobility-Assisted Routing," in *Proceedings of ACM/IEEE MOBIHOC*, 2006. (9% acceptance rate) (91 citations)

- T. Spyropoulos, K. Psounis, and C. S. Raghavendra, "Spray and Wait: An Efficient Routing Scheme for Intermittently Connected Mobile Networks," in *Proceedings of ACM SIGCOMM workshop on Delay Tolerant Networking (WDTN-05)*, August 2005. (22% acceptance rate) (340 citations)
- T. Spyropoulos, K. Psounis, and C. S. Raghavendra, "Single-copy Routing in Intermittently Connected Mobile Networks," in *Proceedings of IEEE SECON*, October 2004. (19% acceptance rate) (123 citations)
- A. Spyropoulos, and C. S. Raghavendra, "ADAPT: A Media Access Control Protocol for Mobile Ad Hoc Networks Using Adaptive Array Antennas," in *Proceedings of IEEE PIMRC'04*, 2004.
- A. Spyropoulos, and C. S. Raghavendra, "Asymptotic Capacity Bounds for Ad-hoc Networks: The Directional and Smart Antenna Cases," in *Proceedings of IEEE GLOBECOM*, 2003. (32 citations)
- A. Spyropoulos, and C. S. Raghavendra, "Capacity Bounds for Ad-hoc Networks using Directional Antennas," in *Proceedings of IEEE ICC*, 2003. (70 citations)
- A. Spyropoulos, C. S. Raghavendra, and V. Prasanna, "A Distributed Algorithm for Waking-up in Heterogeneous Sensor Networks," in *Proceedings of ACM/IEEE IPSN*, 2003. (7 citations)
- A. Spyropoulos, and C. S. Raghavendra, "Energy Efficient Routing in Ad Hoc Networks with Directional Antennas," in *Proceedings of IEEE INFOCOM*, 2002.(16% acceptance rate) (135 citations)
- A. Spyropoulos, and C. S. Raghavendra, "A Token-based Greedy Chain scheduling Algorithm (T-GCSA) for Situation Aware, Long-Range Wireless LANs with Highly Mobile Nodes," in *Proceedings of IEEE Aerospace Conference*, 2002.

#### MISCELLANEOUS

- T. Spyropoulos, T. Turletti, and K. Obraczka, "Utility-based Message Replication for Intermittently Connected Heterogeneous Networks," INRIA Technical Report, RR-6129, Feb 2007.
- T. Spyropoulos, and C. S. Raghavendra, "Analyzing the Effect of Antenna Type and MAC Protocol on Wireless Ad-Hoc Network Capacity," USC Technical Report, 2006.
- Efficient Media Access and Routing in Wireless and Delay Tolerant Networks, T. Spyropoulos, *Ph.D Thesis*, University of Southern California, Los Angeles, Jan 2006.

#### OTHER INFORMATION

Member of IEEE and ACM.

LANGUAGES: Greek (native), English (fluent), German (Mittelstufe Prufung), French (conversational).

#### REFERENCES

Prof. Konstantinos Psounis  
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