

# Ioannis Papapanagiotou

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## CONTACT INFORMATION

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## EDUCATION

**North Carolina State University**, Raleigh NC, USA

*PhD in Computer Engineering and Operations Research* **2009 - 2012**

- Dual Major - completed coursework for both degrees;
- Advisors: Michael Devetsikiotis, FIEEE (ECE) and Harry Perros, FIEEE (OR)
- Thesis Title: Design and Optimization of Mobile Aggregation Architectures

*MSc in Computer Engineering* **2007 – 2009**

- GPA: 3.97/4.00

**University of Patras**, Rion, Greece

*Diploma of Electrical & Computer Engineering - 5 years degree* **2001 - 2006**

- Thesis Title: Analysis and Simulation of Quality of Service in WLANs
- Graduation Rank: top 10%

## PROFESSIONAL EXPERIENCE

**IBM**, RTP NC

*Emerging Technology Institute Solutions Developer* **2012 - now**

- Member of the in-house incubator team reporting to the WebSphere CTO and VP
- Lead developer of the MongoDB extension for WebSphere eXtremeScale and DB2
  - Prototyped a solution for IBM's major DB event (IOD 2012)
  - Collaborated with teams across organizations (AIM, IM and Research)
  - Built expertise in NoSQL/JSON end-stores
- Submitted numerous patent disclosures

**IBM Research**, RTP NC

*Research Associate & Intern* **2010 - 2012**

- Worked with Wireless & IT Convergence team in TJ Watson Research Center
- Designed OS fingerprinting and data deduplication systems
- Analyzed network traces, and applied data mining techniques

**North Carolina State University**, Raleigh NC

*Research Assistant & Teaching Assistant* **2007 - 2010**

- Performed theoretical research on Metro Ethernet Architectures
  - drafted and received grants from Cisco \$200K and Time Warner Cable \$20K
- Designed a Netflow traffic classification methodology and network visualization platform
  - drafted and received grant \$20K from ITng Institute at NCSU
- Teaching
  - Teaching Assistant in Basic and Advanced Computer Networking courses
  - Taught a distance education section in the University of North Carolina at Asheville
  - Advised MSc thesis, and senior students in last semester projects.

**VTT Research Center**, Espoo Finland

*Visiting Researcher* **Summer 2007**

- Performance Modeling of the Energy Consumption in WiMAX networks.

**University of Patras**, Rion Greece

*Research Engineer* **2006-2007**

- Designed a citywide Wireless Network (Metro WiFi) - handling budget \$250K
- Research on Performance Analysis of IEEE 802.11e (Markov Analysis and Queueing Theory)
- Metro-Wifi Expert: (a) Offered technical tutorials to OTE S.A. - Deutsche Telecom subsidy; (b) Developed the official portfolio for training the Greek engineers.

## HONORS AND AWARDS

IBM First Patent Award 2012  
IBM PhD Fellowship 2011-2012  
Academy of Athens Scholarship (2 country-wide) 2007-2011  
Andreas Metzelopoulos Fellowship (4 university-wide) 2009-2011  
Best Paper Award IEEE CAMAD 2010  
Best Paper Award IEEE GLOBECOM 2007  
NSF Travel Grant Awards (x2) IEEE GLOBECOM 2007 & 2010  
Outstanding Teacher's Assistant Awards (x2) 2008 & 2009  
Mentor Teaching Assistantship Award 2009-2010

## SKILLS

**Software Development:** C/C++, Java, Javascript (Node.js), Python, Linux Shell  
**Source Code Management:** SVN, CVS, RTC, Git  
**Databases/Caching:** MongoDB, BerkeleyDB, MySQL, DB2, WebSphere eXtreme Scale  
**Science Tools:** MATLAB, Mathematica, CPLEX  
**Network Simulations/Emulations:** OPNET Modeler, Network Simulator, Dynamips (Cisco IOS emulator)  
**Network Programming:** Network server development (threaded IO/NIO), Packet Analysis (Libpcap), Intrusion Detection (Libnids/Bro IDS)

## SERVICE

### Professional Service

- Committee voting member, IEEE Communication Systems Integrations and Modeling (CSIM)
- Licensed Professional Engineer in Greece/EU
- Publication chair, IEEE CAMAD 2011 & 2012
- President, ECE NCSU Graduate Student Association 2011-12

### Technical Program Committee:

- IEEE ICC 2010-13
- IEEE GLOBECOM 2009-2013
- IEEE ICCCN 2011-12
- ICNC 2012
- IEEE SmartGridComm 2010-11
- IEEE Broadband Wireless Access Workshop 2008-10

**Reviewer in Journals:** IEEE Transactions on {Parallel and Distributed Systems, Wireless Communications, Communications}, IEEE Wireless Communications Magazine, IEEE Communications Surveys and Tutorials, IEEE Communications Letters, ACM Transactions on Modeling and Computer Simulation, Springer Mobile Networks and Applications, Elsevier Computer Communications, EURASIP Journal on Wireless Communications and Networking.

## PUBLICATIONS

### Journals

1. I. Papapanagiotou, M. Falkner, M. Devetsikiotis, "Optimal Functionality Placement for Multi-play Service Provider Architectures", IEEE Transactions on Networks and Service Management, Sep. 2012.
2. I. Papapanagiotou, F. Granelli, D. Kliazovich, M. Devetsikiotis, "A Metamodeling Approach for Cross-Layer Optimization: A Framework and Application to Voice over WiFi", Elsevier Simulation Modeling Practice and Theory, 2011.
3. I. Papapanagiotou, D. Toupakaris, J. Lee, M. Devetsikiotis, "A Survey on Mobile WiMAX Networks: Objectives, projected features and technical challenges", IEEE Communications Tutorials & Surveys, 2009, **IEEE ComSoc top ten articles Dec 2009 - April 2010**.
4. I. Papapanagiotou, G.S. Paschos, M. Devetsikiotis, "A Comparison Performance Analysis of QoS WLANs: Approaches with Enhanced Features", Advances in Multimedia Journal, Hindawi Publications. Volume 2007, Article ID 23817.

5. G. S. Paschos, I. Papapanagiotou, S. A. Kotsopoulos, G. Karagiannidis, "A new MAC protocol with pseudo-TDMA behavior for supporting QoS in 802.11 WLANs", *EURASIP Journal on Wireless Communications and Networking*, Volume 2006, Article ID 65836.

## Conferences

1. I. S. Bayram, G. Michailidis, I. Papapanagiotou, M. Devetsikiotis, "Game Theoretic Based Load Balancing of Electric Vehicles with Fast Charging Stations", *IEEE GLOBECOM 2013* (under review)
2. I. Papapanagiotou, E. Nahum, V. Pappas, "Configuring DHCP Leases in the Smartphone Era", *ACM IMC 2012*, Boston MA.
3. I. Papapanagiotou, E. Nahum, V. Pappas, "Smartphones vs. Laptops: Comparing Web Browsing Behavior and the Implications for Caching", *ACM SIGMETRICS 2012*, London, UK.
4. I. Papapanagiotou, R.D. Callaway, M. Devetsikiotis, "Chunk and Object Level Deduplication for Web Optimization: A Hybrid Approach", *IEEE ICC 2012*, Ottawa Canada.
5. A.M. Gossett, I. Papapanagiotou, M. Devetsikiotis, "An Apparatus for P2P Classification in Netflow Traces", *IEEE GLOBECOM 2010 Workshop on Enabling the Future Service-Oriented Internet (EFSOI 2010)*. **NSF STG Award**
6. U.K. Chaudhary, I. Papapanagiotou, M. Devetsikiotis, "Flow Classification Using Clustering and Association Rule Mining", *IEEE CAMAD 2010*, Miami FL, USA. **Best Paper Award**
7. I. Papapanagiotou, M. Devetsikiotis, "Aggregation Design Methodologies for Triple Play Services" *IEEE CCNC 2010*, Las Vegas NV, USA.
8. I. Papapanagiotou, G.S. Paschos, S.A. Kotsopoulos, M. Devetsikiotis, "Extensions and Comparison of QoS-Enabled WiFi Models in the Presence of Errors", *IEEE GLOBECOM 2007*, Washington DC, USA. **Best Paper Award / NSF STG Award**
9. I. Papapanagiotou, J.S. Vardakas, G.S. Paschos, M.D. Logothetis, S.A. Kotsopoulos, "Performance Evaluation of IEEE 802.11e based on ON-OFF Traffic Model", *ACM MOBIMEDIA 2007*, Nafpaktos, Greece.
10. J. S. Vardakas, I. Papapanagiotou, M. D. Logothetis, S.A. Kotsopoulos, "On the End-to-End Delay Analysis of the IEEE 802.11 Distributed Coordination Function", *IEEE Computer Society, 2nd ICIMP 2007*, Silicon Valley, USA.
11. G. S. Paschos, I. Papapanagiotou, C. G Argyropoulos, S. A. Kotsopoulos, "A Heuristic Strategy for 802.16 WiMAX scheduler for Quality of Service", *45th Congress FITCE 2006*, Athens, Greece.
12. G. S. Paschos, I. Papapanagiotou, E. D. Vagenas, S. A. Kotsopoulos, "Performance analysis of a new Admission Control for 802.11 WLAN Networks in ad hoc mode", *CSNDSP 2006*, Patras, Greece.

## Patents

1. I. Papapanagiotou, E. Nahum, V. Pappas, "Systems and Apparatus for Differential DHCP Lease Allocation in Wireless Networks" (filed to USPTO).
2. I. Papapanagiotou, R.D. Callaway, "Systems and Apparatus for Dynamic Selection of Caching Methodologies in Network Intermediaries" (filed to USPTO).
3. I. Papapanagiotou, R.D. Callaway, "Systems and Apparatus for Service Differentiation in Middleware Systems" (Search).
4. I. Papapanagiotou, R. Gosh and A. Cornville, "Method and Apparatus for Autonomously handling Dynamic Indexes in Flexible Schema Documents in NoSQL solutions" (Search).
5. I. Papapanagiotou, R.D. Callaway and A. Rodriguez, "System and Apparatus for Distributed Data Deduplication in Enterprise Networks" (Search).
6. I. Papapanagiotou, R.D. Callaway, "An Apparatus for Training a Multi-Caching System's Scheduler" (under review).
7. I. Papapanagiotou, R.D. Callaway, "An Apparatus for leveraging General Purpose GPUs for JSON Acceleration in Front-End Caches" (under review)

## Book Chapters

1. G.S. Paschos, I. Papapanagiotou, T.M. Bohnert, "Power Saving Mechanisms in IEEE 802.16e Wireless Networks", in "WiMAX Networks Planning and Optimization", Auerbach Publications, CRC Press, April 2009.
2. I. Papapanagiotou, J. Hui, M. Devetsikiotis, "On the Pricing of WiMAX networks", in "WiMAX Evolution: Emerging Technologies and Applications", John Wiley & Sons Publications, March 2009.
3. I. Papapanagiotou, G.S. Paschos, "A case study on the Energy Consumption and Mobility of the WLANs and WMANs", in "Heterogeneous Next Generation Networks, Innovations and platforms", IDEA Group Publishing, October 2008.

**Citations** 121, source Google Scholar

#### VISITS & TALKS

- "Byte Caching in Wireless Networks", IBM TJ Watson Research Center, NY USA, Dec. 2011
- "Aggregation Design Methodologies for Multiplay Architectures", CISCO Webex Seminar, May 2010.
- "Networked 3D Virtual Computing for Collaborative Environments in Science and Education: Towards VCL 3.0", 2nd Int Conference on the Virtual Computing Initiative (ICVCI 2), pp. 68-75, IBM NC USA, 2009.
- "Modeling Broadband Aggregation Architecture for Emerging and Future Traffic Patterns", Hot topic presentation on the 2nd IEEE Workshop on Enabling the Future Oriented Internet, co-located with IEEE GLOBECOM 2008, New Orleans LA USA.

#### MENTORING STUDENTS

##### **MSc Thesis**

- "Analysis of Broadband Networks for Triple Play services" Umang Chaudhary 2010

##### **MSc Independent Study**

- "Application classification from Netflow Traces" Andrew Gossett, 2010.
- "Capturing Real Time Traffic in Centennial Campus" Selvaganapath Chidambaram, 2010.
- "Study and Analysis of Netflow Archive Data", Pulla Indira Radhika, 2009
- "Modeling Broadband Architectures for Emerging Traffic Patterns" Sindhura Ramegowda, 2008

##### **Senior Design Projects**

- "Improved Performance of Network Applications with Graphic Processing Units" Spring 2012
- "Capturing Real Time Traffic in Networks" Spring & Fall 2009
- "Educational Perspectives from the Virtualization of Networking Labs" Spring & Fall 2009

#### LANGUAGES

Greek (mother tongue), English (Fluent), French (Basic)