Konstantinos Tsoukatos

Address:	Panopoulou 11 Larisa 41334	Telephone: E-mail:	(+30) 2410 684593 ktsouk *sto* teilar *teleia* gr

Interests

Systems optimization and performance evaluation. Wireless and wireline communication networks. Probability, random processes, queueing theory, and applications.

Professional Experience

September 2019 - now **University of Thessaly, Lamia, Greece**

Assistant Professor

Teaching and advising in the Department of Computer Science and Biomedical Informatics.

2008 – 2019 **Technological Education Institute of Thessaly**

Assistant Professor

Teaching undergraduate courses in Communication Systems 1 (4th semester), Computer Networks 1 (3rd semester), Network Optimization (5th semester), Broadband Communications (7th semester) in the Department of Computer Science and Engineering. Supervision of over 110 undergraduate students' thesis projects until now (2019).

2003 – 2008 **University of Thessaly, Volos, Greece**

Adjunct Assistant Professor

Teaching courses in Signal and System Theory (5th semester), Mathematics for Communications (6th semester), Digital Communications (6th semester), Applied Random Processes (7th semester, graduate), Information Theory (9th semester, graduate), Wireless Communications (graduate) in the Department of Computer and Communications Engineering.

2000 – 2001 **National Technical University of Athens, Greece**

Postdoctoral Associate

Participation in EC IST project ANDROID, aiming at creating an active networking testbed. Participation in Hellenic Telecommunications Organisation projects on wireless local area networks supporting IP mobility, installation of development platforms for WAP applications, preparation of educational material on DSL technologies.

1996 – 1999 **Institute for Systems Research, MD, US**

Graduate Research Assistant

Mathematical modeling and analysis of self–similar and long–range–dependent Internet traffic. Development of heavy and light traffic asymptotics and approximations, for a family of queueing models with (strongly) correlated arrival processes. Application of importance sampling techniques to the estimation of rare event probabilities.

Summer 1994, 1995 **IBM T.J. Watson Research Center, NY, US**

Summer Intern

Analysis and simulation of scheduling policies in distributed parallel queueing systems with synchronization constraints, and queueing systems with multiple classes and time – dependent priorities.

1994 – 1996 **Department of Electrical Engineering, MD, US**

Graduate Teaching Assistant

Conducted electronics laboratory courses for junior and senior undergraduate students, prepared quizzes, graded reports and exams.

Research Project Participation

ΑΡΧΙΜΗΔΗΣ III: Optimal resource allocation in broadband wireless networks [budget: 100K€]
EURONGI: Design and engineering of Next Generation Internet towards convergent multi-service networks (Project Lead for JRA.S.09 RAWQOS) [budget: 45 K€]
ΑΡΧΙΜΗΔΗΣ II: Resource allocation techniques for capacity enhancements of mobile communication networks
ΠΕΝΕΔ 2003: Resource allocation and security in wireless networks
NEWCOM: Network of Excellence in Wireless Communications

Education

1994 – 1999 **University of Maryland, College Park, MD, US**

PhD Electrical Engineering

Thesis: Heavy and light traffic regimes for M/G/∞ network traffic models.

Advisor: Armand M. Makowski, IEEE Fellow.

1992 – 1994 **University of Maryland, College Park, MD, US**

MSc Electrical Engineering

Area of specialization: Communications

GPA: 3.65 / 4.0

1987 – 1992 **National Technical University of Athens, Greece**

Diploma Electrical Engineering

Area of specialization: Electronics Electrical Engineering

GPA: 8.7 / 10.0 (top 5% of class)

Distinctions

Eugenides Foundation Scholarship, Athens, Greece, for graduate studies at the University of Maryland, during the 1992 – 1993 academic year.

Top - 5 finalist in student paper contest, 15th International Teletraffic Congress ITC 15, Washington (DC), June 1997.

Best paper candidate, 11th EAI International Conference on Performance Evaluation Methodologies and Tools, Venice, Italy, December 2017.

Refereed journal papers

1. K. P. Tsoukatos, "*Network formation by* r*eciprocity vs sparsity tradeoffs",* IEEE Transactions on Network Science and Engineering, minor revision (2019).

2. K. P. Tsoukatos, A. Giannoulis, "*Lightweight power control for energy-utility optimization in wireless networks*", Ad Hoc Networks 63, (2017), pp. 91–103.

3. K. P. Tsoukatos, M.-P. Chrisanthopoulou, A. Apostolaras, *"Cross–layer antenna beamforming and power control in wireless uplinks"*, Wireless Personal Communications, 51, 3 (2009), pp. 459 - 469.

4. K. P. Tsoukatos, A. M. Makowski, *"Power–law vs exponential queueing in a network traffic model"*, Performance Evaluation, 65, 1 (2008), pp. 32 – 50.

5. I. Koutsopoulos, K. P. Tsoukatos, K. Aggelis, *"Physical layer techniques and maximum throughput scheduling with antenna arrays",* IEEE Communications Letters 10, 6 (2006), pp. 465 - 467.

6. K. P. Tsoukatos, A. M. Makowski, *"Asymptotic optimality of the round – robin policy in multipath routing with resequencing*," Queueing Systems - Theory and Applications, 52, 3 (2006), pp. 199 – 214.

7. K. P. Tsoukatos, A. M. Makowski, *"Heavy traffic limits associated with* M/G/∞ *input processes,*" Queueing Systems - Theory and Applications, 34, 1 – 5 (2000), pp. 101 - 130.

8. E. D. Sykas, K. M. Vlakos, K. P. Tsoukatos, E. N. Protonotarios, *"Performance evaluation of analytical models for effective bandwidth allocation in ATM networks*," European Transactions on Telecommunications 5 (1994), pp. 391 -396.

Refereed conference papers

1. K. P. Tsoukatos, "*Reciprocity-driven sparse network formation*", in 11th EAI International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS 2017), Venice, Italy, December 4-7, 2017.
2. K. P. Tsoukatos, "*Real-time interference mitigation by randomized convex approximation*", in 22nd IEEE Symposium on Computers and Communications (ISCC 2017), Heraklion, Greece, July 3-6, 2017.
3. M. Dimou, T. Kossyvakis, C. Chaikalis, K. P. Tsoukatos, C. Liolios, V. Vlachos, "*Topology experimentation in a Zigbee wireless sensor network*", in 20th Panhellenic Conference on Informatics (PCI'16), Patras, Greece, November 10-12, 2016.

4. T. K. Katsibas, V. Vlachos, C. Chaikalis, K. P. Tsoukatos, C. Liolios, *t*, Telecommunications Forum (TELFOR), Belgrade, Serbia, November 24-26, 2015.

5. K. P. Tsoukatos, *"Low-complexity distributed power control for utility maximization in wireless networks*", in Proceedings of the 11th International Wireless Communications & Mobile Computing Conference (IWCMC), Dubrovnik, Croatia, August 24-28, 2015.

6. M.-P. Chrisanthopoulou, K. P. Tsoukatos, *"Joint beamforming and power control for CDMA uplink throughput maximization"*, in 18th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, Athens, Greece, September, 3-7, 2007.

7. A. Giannoulis, K. P. Tsoukatos, L. Tassiulas, *"Maximum throughput power control in CDMA wireless networks"*, in IEEE International Conference on Communications ICC' 06, Istanbul (Turkey), June 11 – 15, 2006.

8. A. Giannoulis, K. P. Tsoukatos, L. Tassiulas, *"Lightweight cross – layer control algorithms for fairness and energy efficiency in CDMA ad-hoc networks"*, in Proceedings of the 4th International Symposium on Modeling and Optimization in Mobile, Ad-hoc and Wireless Networks, WiOpt '06, Boston (MA), April 3 - 7, 2006.
9. A. Giannoulis, K. P. Tsoukatos, L. Tassiulas, *"Cross–layer power control in wireless networks"*, ACM SIGMETRICS Performance Evaluation Review 34, 2 (2006), Special Issue on Performance 2005 posters, pp. 29 - 31.

10. N. Dragios, C. Harbilas, K. P. Tsoukatos, G. Karetsos, *"An architecture for publishing and distributing service components in active networks*," in 11th International Conference on Telecommunications ICT'04, Fortaleza (Brazil), August 2004, Lecture Notes in Computer Science 3124, pp. 227 – 233, 2004.

11. K. P. Tsoukatos, A. M. Makowski, *"Stochastic comparisons for a static routing problem with resequencing,"* in IEEE International Conference on Communications ICC' 04, Paris (France), June 2004, pp. 2127 - 2131.

12. K. P. Tsoukatos, A. M. Makowski, *"Interpolation approximations for* M/G/∞ *arrival processes*," in IEEE International Conference on Communications ICC '99, Vancouver (Canada), June 1999, pp. 392 - 396.

13. K. P. Tsoukatos, A. M. Makowski, *"Heavy traffic analysis for a multiplexer driven by* M/G/∞ *input processes,"* in 15th International Teletraffic Congress ITC 15 , Washington (DC), June 1997, pp. 497 - 506.

14. K. P. Tsoukatos, *"Power control in a mobility environment*," in IEEE Vehicular Technology Conference VTC' 97, Phoenix (AZ), May 1997, pp. 740 - 744.

15. M. S. Squillante, K. P. Tsoukatos, *"Optimal scheduling of coarse-grained parallel scientific applications*," in 8th SIAM Conference for Parallel Processing for Scientific Computing, Minneapolis (MN), March 14 – 17, 1997.

16. M. S. Squillante, K. P. Tsoukatos, *"Analysis of optimal scheduling in distributed parallel queueing systems,*" in 12th International Conference on Computer Communications, Seoul (Korea,) August 1995, pp. 395 - 400 (also IBM Technical Report RC - 19885).

17. E. D. Sykas, K. M. Vlakos, K. P. Tsoukatos, E. N. Protonotarios, ``*Congestion control – effective bandwidth allocation in ATM networks"*, in High Performance Networking IV, IFIP Transactions C – Communication Systems 14, 1993, pp. 65-80.

Citations

174 citations in Google Scholar, h-index: 8.
26 citations in Web of Science journals (excluding self-citations)

Service

Journal reviewer: IEEE/ACM Transactions on Networking, IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Transactions on Computers, Performance Evaluation Journal, Computer Networks, Wireless Networks, Journal of Discrete Event Dynamic Systems.

Conference reviewer: IEEE INFOCOM, IEEE ICC, IEEE VTC, IEEE PIMRC, WiOpt, European Wireless, PCI, etc.

Student research supervision

Anastasios Giannoulis (Ericsson excellence award 2006, PhD Rice University 2012)
Konstantinos Aggelis
Maria-Pinelopi Chrisanthopoulou
Apostolos Apostolaras (EETT award, 1st ΣΦΗΜΜΥ student conference 2007, PhD University of Thessaly 2014)

Selected citations in Web of Science journals

1. Mikosch T, Resnick S, Rootzen H, et al.
Is network traffic approximated by stable Levy motion or fractional Brownian motion?
ANN APPL PROBAB 12 (1): 23-68 FEB 2002

2. Menon G, Pego RL
Approach to self-similarity in Smoluchowski's coagulation equations
COMMUN PUR APPL MATH 57 (9): 1197-1232 SEP 2004

3. Shoarinejad K, Speyer JL, Pottie GJ
Integrated predictive power control and dynamic channel assignment in mobile radio systems
IEEE T WIREL COMMUN 2 (5): 976-988 SEP 2003

4. Jelenkovic PR
Subexponential loss rates in a GI/GI/1 queue with applications
QUEUEING SYST 33 (1-3): 91-123 1999

5. Michiel H, Laevens K
Teletraffic engineering in a broad-band era
P IEEE 85 (12): 2007-2033 DEC 1997

6. Ramaswamy S, Ono-Tesfaye T, Armstrong WW, et al.
Equivalent bandwidth characterization for real-time CAC in ATM networks
J HIGH SPEED NETW 7 (1): 1-25 1998

7. Addie RG, Neame TD, Zukerman M
Performance evaluation of a queue fed by a Poisson Pareto burst process
COMPUT NETW 40 (3): 377-397 OCT 22 2002

8. Lozano A, Cox DC
Integrated dynamic channel assignment and power control in TDMA mobile wireless communication systems
IEEE J SEL AREA COMM 17 (11): 2031-2040 NOV 1999

9. Kim JY, Stuber GL, Akyildiz IF
A simple performance/capacity analysis of multiclass macrodiversity CDMA cellular systems
IEEE T COMMUN 50 (2): 304-308 FEB 2002

10. Whitt W
An overview of Brownian and non-Brownian FCLTs for the single-server queue
QUEUEING SYST 36 (1-3): 39-70 2000

11. Whitt W
Limits for cumulative input processes to queues
PROBAB ENG INFORM SC 14 (2): 123-150 2000

12. Xi Y, Yeh EM
Throughput optimal distributed control of stochastic wireless networks
IEEE ACM T NETWORK 18 (4) 1054-1066 AUG 2010

13. Matskani E, Sidiropoulos ND, Tassiulas L.
Convex approximation algorithms for backpressure power control
IEEE T SIGNAL PROC 60 (4): 1957-1970 APR 2012

14. Marques AG, Lopez-Ramos LM, Giannakis GB. et al.
Optimal cross-layer resource allocation in cellular networks using channel- and queue-state information
IEEE T VEHIC TECHN (61) 6 2789-2807 JUL 2012

15. Gopalakrishan B, Sidiropoulos ND.
Back-pressure power control and interference cancellation in wireless multi-hop networks
IEEE T WIREL COMM (12) 7 3484-3495 JUL 2013

16. Zhao F, Wang W, Chen H, Zhang Q.
Interference Alignment and game-theoretic power allocation in MIMO heterogeneous sensor communications
SIGNAL PROC (126) 173-179 SEP 2016

17. Fiems D, De Turck K.
Taylor-series approximations for queues with arrival correlation
APPL MATH MOD (69) 113-126, MAY 2019