UNIVERSITÀ DI PISA

DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE

Dottorato di Ricerca in Ingegneria dell'Informazione

Doctoral Course

"Mathematical Modeling Issues in the Future Multiservice Networks"

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Short Abstract: Over the past few years, there has been an increasing level of research activities worldwide to design and performance analysis for the future multiservice networks, namely M2M and D2D communications over the LTE networks, P2P live streaming networks. Our course outlines how mathematical models are being used to address current issues concerning quality of service and performance parameters of the modern and future networks. We shall first show models based on the teletraffic and queuing theory and reflecting key features of admission control mechanisms in the LTE network. We also show some stochastic geometry problems of the interference analysis in D2D wireless networks. Finally, we are discussing the problem of peer-to-peer streaming network simulation taking into account several types of selection strategies: neighbor selection strategy, peer selection strategy and chunk selection strategy. There should be great opportunities for the scientific community to contribute to solution of these problems in the forthcoming decade.

Course Contents in brief:

- Topic 1 New paradigm in telecommunications and shift in teletraffic theory (2 hours)
- Topic 2 Modeling access delay of MTC devices over LTE-A network (6 hours)
- Topic 3 Stochastic geometry models and SIR analysis in D2D wireless networks (6 hours)
- Topic 4 Modeling selection strategies of the P2P streaming network (6 hours)

Total # of hours: 20 hours

References:

[1] M. Zukerman, Introduction to Queueing Theory and Stochastic Teletraffic Models, PDF

[2] "Queuing - MATLAB & Simulink". www.mathworks.com. Retrieved 2016-06-23.

[3] P. P. Bocharov, C. D'Apice, A. V. Pechinkin, Queueing Theory, Walter de Gruyter, 2003. – 460p

CV of the Teachers

Konstantin Samouylov received his Ph.D. from the Moscow State University and a Doctor of Sciences degree from the Moscow Technical University of Communications and Informatics. During 1985-1996 he held several positions at the Faculty of Science of the Peoples' Friendship University of Russia where he became a head of Telecommunication System Department in 1996. Since 2014 he is a head of the Department of Applied Probability and Informatics. His current research interests are probability theory and theory of queuing systems, performance analysis of 4G/5G networks, teletraffic of triple play networks, and signaling networks planning. He is the author of more than 150 scientific and conference papers and six books. His email address is ksam@sci.pfu.edu.ru.

Yuliya Gaidamaka received the Ph.D. in Mathematics from the Peoples' Friendship University of Russia in 2001. Since then, she has been an associate professor in the university's Department of Applied Probability and Informatics. Her current research focuses on performance analysis of 4G/5G networks and M2M communications, P2P networks, signaling networks congestion control, queuing theory, and mathematical modeling of communication networks. She is the author of more than 50 scientific and conference papers and one book. Her email address is ygaidamaka@sci.pfu.edu.ru.

Room and Schedule

Room: *Aula Riunioni del Dipartimento di Ingegneria dell'Informazione, Via G. Caruso 16, Pisa – Ground Floor*

Schedule:

April 3 to 7, 2017: 9:00-13.00 each day