

Professor Eduard Jorswieck

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Game Theory — Fundamentals and Applications in Signal Processing and Communications

Professor Eduard Jorswieck



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Short Bio

Eduard A. Jorswieck was born in 1975 in Berlin, Germany. He received his Diplom-Ingenieur (M.S.) degree and Doktor-Ingenieur (Ph.D.) degree, both in electrical engineering and computer science from the Technische Universität Berlin, Germany, in 2000 and 2004, respectively. He was with the Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut (HHI) Berlin, in the Broadband Mobile Communication Networks Department from December 2000 to January 2008. Since April 2005 he has been a lecturer at the Technische Universität Berlin. In February 2006, he joined the Department of Signals, Sensors and Systems at the Royal Institute of Technology (KTH) as a post-doc and became an Assistant Professor in 2007. Since February 2008, he has been the head of the Chair of Communications Theory and Full Professor at Dresden University of Technology (TUD), Germany. Eduard's main research interests are in the area of signal processing for communications and networks, applied information theory, and communications theory. He has published over 40 journal papers and 120 conference papers on these topics.

Dr. Jorswieck is senior member of IEEE. He is member of the IEEE SPCOM Technical Committee. Since 2008, continuing until 2010, he has served as an Associate Editor for IEEE Signal Processing Letters. In 2006, he received the IEEE Signal Processing Society Best Paper Award for the paper coauthored by H. Boche "Optimal Transmission Strategies and Impact of Correlation in Multiantenna Systems with Different Types of Channel State Information". In 2002, he received the best paper award at IEEE WPMC. Eduard is Guest Editor in IEEE Signal Processing Magazine 2009, special issue on "Game Theory in Signal Processing and Communications", and Lead Guest Editor in EURASIP Journal on Advances in Signal Processing 2009, special issue on "Game Theory in Signal Processing and Communications".

Location & Time

Monday 11 April 2011 14:30-17:00 (part 1), room T2:C3-434
 Wednesday 13 April 2011 14:30-17:00 (part 2), room T2:C3-434
 The lecture is open for all academics and students.

Lecture abstract

Game theory is a branch of mathematics which models systems with multiple agents or players. One aim is to predict the rational outcome of (social) conflict situations. In an engineering context, the conflict situation can be interpreted as a multi-objective optimization problem. The conflicting utilities of the agents usually depend on their own as well as on the actions of the others.

In general game theory provides a structured approach to many important problems arising in signal processing and communications, notably resource allocation and robust transceiver optimization. Recent applications also occur in other emerging fields such as cognitive radio, spectrum sharing, and in multi-hop sensor and ad-hoc networks.

The lectures will present first the basic theory including utility modeling, games in normal form and their solution concepts. All models and solution concepts are illustrated by applications from signal processing and communications either by work of the presenters or by examples from recent literature. In the second part, more advanced concepts including (extensive form and repeated games, as well as coalitional game theory) are introduced and illustrated with applications in signal processing.

- Basic theory (Utility theory and preference relations, Games on normal form, Cooperative games and Nash bargaining, Games with incomplete information, Exchange economy)
- Advanced theory (Games in extensive form, Repeated games, behavioural games, evolutionary games, Games in characteristic form, coalitional games, Pricing and social welfare theory, Mechanism design and implementation theory)
- Applications (SISO, MISO and MIMO channels, multiuser and interference channels, advanced applications)

About DiRaC (Digital Radio Communications) group

DiRaC group is the research group at the department of Radio Engineering K13137 at FEE/CTU. The group is headed by prof. Jan Sykora. General areas of activity are: Digital communication theory - modulation, coding, physical layer signal processing algorithms, Information theory, Parameter estimation and detection theory, Stochastic signal processing.

In our current effort, we concentrate on: Mobile radio communication systems with distributed, cooperative and MIMO coding and processing, Network coded modulation in Multi-node and Multi-source systems, Spatial diversity technique, particularly MIMO systems, Nonlinear Space-time modulation and coding, Iterative Factor Graph based technique in detection, channel state estimation and equalization, Adaptive modulation under specific constraints.

More information at . . .

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