

SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

Modeling Energy Flows with Energy Packets: from Nano- to Mega-Watts

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Abstract: Since 2007 when a Gartner report indicated that the CO₂ impact of ICT's energy consumption for its operations was roughly equivalent to that of air travel, without including the effect of manufacturing and decommissioning of computers and communication equipment, there has been a substantial research interest in this area, while the growth of electricity consumption for ICT has steadily grown by 4-5% since then. We will describe some work we have been doing to understand the balance between energy consumption and system performance both for computing and communication systems, and describe a proposed new framework for this analysis that uses a discrete representation of energy units we call "energy packets". At the nano level we will discuss how one may communicate with electron spins, where an electron is itself the energy packet which also carries information. At the micro level we will discuss energy harvesting wireless sensors, while at the large scale we will discuss how energy flows in a data centre may be modeled.

Thursday, March 26, 2015

11:10 a.m.

Green Hall, Room 0120

Host: Arye Nehorai

Short Bio: Erol Gelenbe is the Gabor Chair Professor and Head of Intelligent Systems and Networks at Imperial College. Currently active in research on the interface between ICT and energy, he also coordinates a large research project on mobile network security. A Fellow of ACM and of the IEEE, he is an elected member of the National Academies of Belgium, France, Hungary, Poland and of his native Turkey.