

Network-on-Package for Low-Power High-Performance Computing

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Abstract – Modern multi-core multi-processor computing systems rely on high-bandwidth data communication between different units in such distributed systems. Chip-to-chip communication over very short distances is now becoming a very hot and demanding topic of research. Due to heat, yield, and performance concerns, many companies are moving toward multi-chip-module (MCM) SoCs. In such systems, the data rate as well as energy consumption are extremely crucial. Due to stringent power budget, industry is seeking out for new design methodologies to implement very dense and energy-efficient links. The main focus of this talk is on techniques to implement such high-performance links over copper. Using novel circuit architectures in conjunction with low ISI sensitivity signaling method allows to implement very energy-efficient and very high-speed links.

Bio – Armin Tajalli is an assistant professor in the Electrical and Communication Engineering Department, University of Utah. He has more than 20 years experience in the field of high-speed integrated communication systems. He has been system architect and design manager of industry's one of the lowest consumption products (500 Gb/s 0.8 pJ/b). For this project, he managed a team of 20+ engineers (including 5 PhDs) distributed over four design sites. His works on developing novel signaling schemes, design of integrated encoder circuits, as well as innovative circuits and architectures have been essential to design extremely high-speed and energy-efficient serial links. He has published more than 80 articles in peer reviewed journals and conferences, and has filed 29 patents (several already granted). He has received several awards, including The Best Paper Award in DesignCon (2016), PhD Prime Award at EPFL, Switzerland (2010), and IEEE AMD/CICC Scholarship (2009).