Motivated by the trend toward more collaboration in work flows, we study networks where some activities require the simultaneous processing by multiple types of multitasking human resources. Collaboration imposes constraints on the capacity of the process because multitasking resources have to be simultaneously at the right place. We introduce the notions of collaboration architecture and unavoidable bottleneck idleness to study the maximal throughput or capacity of such networks. Collaboration and multitasking introduce synchronization requirements that may inflict unavoidable idleness of the bottleneck resources: even when the network is continuously busy (processing at capacity), bottleneck resources can never be fully utilized. The conventional approach that equates network capacity with bottleneck capacity is then incorrect because the network capacity is below that of the bottlenecks. We introduce a class of collaboration architectures that guarantee that there is no unavoidable idleness. The collaboration architecture view has also implications to investment in resource cross-training.

The talk is based on joint work with Jan Van Mieghem.

Bio

Professor Gurvich joined the faculty at the Kellogg School of Management in 2008, after completing his PhD in the Decision, Risk and Operations department at Columbia University's Graduate School of Business. At Kellogg, he teaches courses in operations management and service operations. His research focuses on the analysis and optimization of service systems, with a focus on the design of processing networks. He has been recently involved in several health-care related projects both at the policy and tactical levels.