Who: Mario Goldenbaum

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Title: On Secure Computation over Multiple-Access Wiretap Channels

Abstract: An integral part of the emerging Internet of Things (IoT) will be the reliable and efficient computation of functions that depend on the data available at spatially distributed terminals/agents (e.g., smart meters). Functions of interest can be, for instance, the maximum carbon-monoxide concentration in a building for fire detection, the average frequency drift in a smart grid, or the controller output of a networked control system. Compared to current network solutions, this will result in a paradigm shift as the efficient transmission of raw data messages is no longer of highest priority. On the other hand, the IoT is expected to be a dynamic decentralized network of billions of distrusting devices so that the security of computation results is important in order to guarantee a trustworthy network operation. As the fundamental information-theoretic limits of secure computation over noisy networks are unknown, in this talk we are presenting some initial results, which demonstrate that the problem of securely computing a function over a multiple-access wiretap channel may significantly differ from the one of securely communicating messages.

Biography: Mario Goldenbaum is a Postdoctoral Research Fellow in the Department of Electrical Engineering at Princeton University hosted by Prof. H. Vincent Poor. He is also a Lecturer in the Department of Electrical and Computer Engineering at Technical University of Munich, Germany. Before moving to Princeton in 2015, he was a Research and Teaching Associate at Technical University of Berlin, Germany. In 2014, he received the Dr.-Ing. degree (Ph.D.) in electrical engineering (with highest distinction) from the Technical University of Munich under the supervision of Prof. Holger Boche. Dr. Goldenbaum was the recipient of the Best Paper Award of the German Information Technology Society in 2014 and of the Science and Engineering Incentive Award of the Vodafone Research Foundation in 2016, respectively.