Invited Talk Markus Endler, Pontifícia Universidade Católica in Rio de Janeiro (PUC-Rio)

Title: ContextNet: a Middleware for the Internet of Mobile Things

Abstract:

Most research on middleware for Internet of Things (IoT) so far has, on the one hand, dealt with methods, protocols and services for ad hoc connection establishment and communication among smart things, and with cloud services, and on the other hand, developed services and technology for processing of sensor data - and the things' states - by cloud-based services. Only recently has research focused on continuous and reactive IoT services using stream-based data analytics and general support for control of different smart things' actuators. Moreover, most of the work has focused on stationary stationary sensors and smart things, and has explored only very little the communication, coordination and control problems for things that are mobile.

With the goal of supporting the development of autonomously reactive applications for the Internet of Mobile Things (IoMT), where smart things can be moved or can move autonomously (e.g. wearables, smart tags at parcels, vehicles, drones), and yet should remain somehow connected, we developed the ContextNet IoMT middleware. ContextNet has a micro-service architecture with cloud- and mobile-based services that enable discovery, stream processing, reliable communication, group-cast, etc. The IoMT approach advocates that multi-purpose portable devices such as smartphones should have a central role as communication and (stream) processing intermediaries between the smart things with WPAN interfaces and the cloud services. In this talk I will present some recent research efforts and results of in the stream reasoning, general actuation support and a multi sided platform for IoMT applications. I will conclude my talk with my vision of some other research challenges in this area.

Bio:

Markus Endler obtained the Dr. rer. nat. in Computer Science from the Technical University of Berlin (1992), and the Professor Livre-docente title (Habilitation) from the University of São Paulo (2001). From 1989 to 1993 he worked as a researcher at the GMD Research Institute Karlsruhe (Germany), and from 1994 to 2000 as an Assistant Professor at the Institute of Mathematics and Statistics of the University of São Paulo (USP). In 2001 he joined the Department of Informatics of the Pontifícia Universidade Católica in Rio de Janeiro (PUC-Rio), where he is currently Associate Professor. In recent years, he has also held Visiting Professor positions in the University of Waterloo, the Laboratoire d'informatique de Universite Paris VI (LIP6), and the Technical University of Dresden.

His main research interests range from Mobile, Pervasive and Cloud Computing., Distributed Algorithms, Data Stream Processing, He has supervised 12 Doctoral and 26 Master theses, and has published more than 160 scientific papers in journals and

refereed conferences. He participates in several Program Committees of international and Brazilian conferences and workshops. Since 2011 he is Program co-Chair of the annual International Workshop on Pervasive Collaboration and Social Networking (IEEE PerCol), and in 2014 he was Program co-Chair of the Simpósio Brasileiro de Redes de Computadores e Sistemas Distribuídos (SBRC), the most important Brazilian event in his area of expertise. He is also member of the ACM, the Brazilian Computer Society (SBC) and of the IFIP Working Group 6.1.

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