Abstract: We conduct an experiment where ten attendees of an open-air music festival are acting as Bluetooth probes. We then construct a parametric statistical model to estimate the total number of visible Bluetooth devices in the festival area. By comparing our estimate with ground truth information provided by probes at the entrances of the festival, we show that the total population can be estimated with a surprisingly low error (1.26% in our experiment), given the small number of agents compared to the area of the festival and the fact that they are regular attendees who move randomly. Also, our statistical model can easily be adapted to obtain more detailed estimates, such as the evolution of the population size over time or the people density distribution.

Bio: Olivier Dousse received his M.Sc. degree in Physics from the Swiss Federal Institute of Technology at Lausanne, Switzerland (EPFL) in 2000, and his Ph.D. degree in Communication Systems from the same institution in 2005. From 2006 to 2008, he was with Deutsche Telekom Laboratories in Berlin. He is currently a Principal Researcher at Nokia Research Center in Lausanne. His research interests are in stochastic models for communication networks and mobile device sensory data. He received the honorable mention at the 2005 ACM Doctoral Dissertation Competition, the IEEE Communication Society 2008 Best Tutorial Paper Award and the MICS Research Contribution Award in 2012. He was also runner-up for the IEEE-Infocom Best Paper Award in 2003. He served as a guest editor of the IEEE Journal on Selected Areas in Communications in 2008 and is serving as an Associate Editor of the IEEE Transactions on Mobile Computing since 2011.

Webpage: http://research.nokia.com/people/olivier_dousse

Host: C. Emre Koksal