

Conférence



Distributed and self-organizing heterogeneous wireless access networks: Design, analysis, and optimization

Prof. Ekram Hossain
IEEE Distinguished Lecturer, IEEE Fellow
University of Manitoba

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Université du Québec à Trois-Rivières

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Résumé :

“Small cell” is an umbrella term for low-power radio access nodes that operate in both licensed and unlicensed spectrum and have a range of 10 meter to several hundred meters. These contrast with a typical mobile macrocell, which might have a range of up to several kilometers or even higher. The term “small cell” covers femtocells, picocells, microcells, and metrocells. The evolving heterogeneous networks (HetNets) including macrocells and small cells of all types (which are also referred to as small cell networks [SCNs] hereafter) are envisioned to provide improved spectrum efficiency (bps/Hz/km²), capacity, and coverage in future wireless networks. SCNs have to be designed not only to support high quality-of-service (QoS), but also to achieve cost-effectiveness, deployment flexibility, and scalability. To achieve the low capital expenditure (CAPEX) and operation expenditure (OPEX), a self-organizing network (SON) architecture should be adopted in the SCNs. After a brief overview of the SCNs, the major challenges in successful deployment of small cells in the next generation cellular wireless systems will be outlined. The concept of self-organization in small cell networks will be then presented. The motivation of self-organization will be discussed, and the desirable behaviors of a self-organizing small cell network in terms of scalability, stability, robustness, and agility will be introduced. In this context, the concept of cognitive small cells will be also introduced which enables the system capable of observing, learning, optimizing, and adapting to environment changes. To this end, several major open research issues and directions for future research on self-reconfiguration in small cell networks will be discussed.

Biographie :

Professor Ekram Hossain (IEEE Fellow) is currently a Professor in the Department of Electrical and Computer Engineering at University of Manitoba, Winnipeg, Canada. He received his Ph.D. in Electrical Engineering from University of Victoria, Canada, in 2001. His current research interests include design, analysis, and optimization of wireless/mobile communications networks, cognitive radio systems, and network economics. He has authored/edited several books in these areas (<http://home.cc.umanitoba.ca/~hossaina>). Dr. Hossain serves as the Editor-in-Chief for the IEEE Communications Surveys and Tutorials, and an Editor for IEEE Wireless Communications. Also, currently he serves on the IEEE Press Editorial Board. Previously, he served as the Area Editor for the IEEE Transactions on Wireless Communications in the area of “Resource Management and Multiple Access” from 2009-2011, an Editor for the IEEE Transactions on Mobile Computing} from 2007-2012, and an Editor for the IEEE Journal on Selected Areas in Communications - Cognitive Radio Series from 2011-2014. Dr. Hossain has won several research awards including the University of Manitoba Merit Award in 2010 and 2014 (for Research and Scholarly Activities), the 2011 IEEE Communications Society Fred Ellersick Prize Paper Award, and the IEEE Wireless Communications and Networking Conference 2012 (WCNC'12) Best Paper Award. He is a Distinguished Lecturer of the IEEE Communications Society. Dr. Hossain is a registered Professional Engineer in the province of Manitoba, Canada.

Pour information supplémentaire, contactez

Adel O. Dahmane, ing., Ph. D.

Président du Chapitre IEEE ComSoc, IEEE Section St-Maurice
dahmane@ieee.org