

Halim Yanikomeroglu (F'17) was born in Giresun, Turkey, in 1968. He received the B.Sc. degree in electrical and electronics engineering from the Middle East Technical University, Ankara, Turkey, in 1990, and the [M.A.Sc.](#) degree in electrical engineering (now ECE) and the Ph.D. degree in electrical and computer engineering from the University of Toronto, Canada, in 1992 and 1998, respectively.

During 1993-1994, he was with the R&D Group of Marconi Kominikasyon A.S., Ankara, Turkey. Since 1998 he has been with the Department of Systems and Computer Engineering at Carleton University, Ottawa, Canada, where he is now a Full Professor. His research interests cover many aspects of wireless technologies with a special emphasis on cellular networks. In recent years, his research has been funded by Huawei, Telus, Allen Vanguard, Blackberry, Samsung, Industry Canada, Communications Research Centre of Canada (CRC), and DragonWave. This collaborative research resulted in about 25 patents.

Dr. Yanikomeroglu is a Fellow of the IEEE. He is a Distinguished Lecturer for the IEEE Communications Society (2015-2018) and a Distinguished Speaker for the IEEE Vehicular Technology Society in 5G wireless technologies. He has been involved in the organization of the IEEE Wireless Communications and Networking Conference (WCNC) from its inception in 1998 in various capacities including serving as a Steering Committee member, Executive Committee member and the Technical Program Chair or Co-Chair of WCNC 2004 (Atlanta), WCNC 2008 (Las Vegas), and WCNC 2014 (Istanbul). He was the General Co-Chair of the IEEE 72nd Vehicular Technology Conference (VTC2010-Fall) held in Ottawa and is currently serving as the General Co-Chair of the IEEE 86th Vehicular Technology Conference (VTC2017-Fall) to be held in Toronto. He has served in the editorial boards of the IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, and IEEE Communications Surveys & Tutorials. He was the Chair of the IEEE's Technical Committee on Personal Communications (now called Wireless Technical Committee).

Dr. Yanikomeroglu is a recipient of the IEEE Ottawa Section Outstanding Educator Award in 2014, Carleton University Faculty Graduate Mentoring Award in 2010, the Carleton University Graduate Students Association Excellence Award in Graduate Teaching in 2010, and the Carleton University Research Achievement Award in 2009. Dr. Yanikomeroglu spent the 2011-2012 academic year at TOBB University of Economics and Technology, Ankara, Turkey, as a Visiting Professor. He is a registered Professional Engineer in the province of Ontario, Canada.

## 5G is Just Around the Corner; So What is Next?

**Abstract:** Since the completion of the first 4G LTE standard in the late 2000s, the research community has been conceiving 5G, mainly from two tangled angles, the novel use cases and the enabling technologies. At the time of the writing of this book, the 5G standardization process has already started; the first 5G standards are scheduled to be finalized in the late 2010s. The 5G is expected to evolve throughout the 2020s; and, probably sometime in the latter part of the 2020s, the 6G standardization process will start, with possible deployments in the early 2030s. It is rather early at this point to over-speculate on 6G. Nevertheless, it is possible to highlight a number of important points in light of the experience gained from the first four or five generations.

The big promise of 5G is that the use cases in this generation will not be confined to the smart phone environment. Therefore, the success of 5G is closely tied to how quickly and to what extent these novel use cases will have market acceptance. Although the maturity of the 5G technologies for enabling the new use cases is essential, this is not the only factor for the success of 5G; arguably, market-readiness of these use cases will play an even more important role. One of the reasons for the great success of 4G LTE has been that the standard involved a number of technologies which were highly successful in enabling a primary use case, namely, video delivery on smart phones. At the same time, there was a great market/demand for this use case – the right synergy for success. 5G is coming with many powerful enabling technologies, many of which are highlighted in this book. However, anticipating the market adoption timeline of the 5G use cases is more difficult, as this timeline depends on factors beyond engineering. For example, the fully autonomous and

connected vehicle paradigm cannot become a reality in a short time frame. A number of new use cases, such as this one, require policy and legislation changes which are inherently long processes. Therefore, during the latter part of the 2020s, when the 6G standardization is likely to occur, the discussions around many of the use cases attributed to 5G will likely to continue in the 6G context as well.

5G marks the start of a new era in wireless. The road towards 5G has been very exciting. The road towards 6G will be even more exciting...

-----