

Performance Analysis of Multi-User Fading Channels

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Abstract

Today, exploiting the multi-user and multi-antenna communication systems as a basic approach in wireless networks such as fifth-generation (5G) technology can improve data achievable rate and spectral efficiency. On the other hand, the engagement of multi-user communication systems has some challenges in the modeling of wireless channels under real radio propagation environments. One of the main challenges in wireless propagation environments is modeling the dependence structure associated with random phenomena in temporal, frequency, or spatial scales, which are often neglected for the sake of tractability. For instance, in multiple-antenna point to point channels due to the physical limitation of antenna spacing and the presence (or absence) of scatterers around receivers and transmitters, or in single antenna and or multi-antenna multi-user channels due to one physical environment, the fading coefficients are not independent of each other.

In this talk, first, the characteristics of some important channels in wireless multi-user communications will be represented. Then, some key points of the Copula theory, which is known as a flexible approach for describing the multivariate distribution, will be explained. Finally, for analytical applications, some important performance metrics in wireless communications will be described mathematically.

Biography

Farshad Rostami Ghadi received the B.Sc. from the Babol Noshirvani University of Technology, Babol, Iran, in 2014, the M.Sc. from the Shahrood University of Technology, Shahrood, Iran, in 2017, and the Ph.D. degree (Hons.) from the Ferdowsi University of Mashhad, Mashhad, Iran, in 2021, all in electrical communication systems engineering. He was a Postdoctoral Fellow with the Communications and Signal Processing Lab, Communications Engineering Department, University of Malaga from Feb. 2021 to Oct. 2021. His research interests include analyzing wireless communication networks, network information theory, and copula theory, with an emphasis on wireless channel modeling and physical layer security.

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