Intelligent Agent-Based Model for the 5G mmWave O2I Technology Adoption

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Abstract : The deployment of the fifth-generation (5G) mobile system through mmWave frequencies is the new solution in the requirement to provide higher bandwidth readily available for all users. The usage pattern of the mobile users has moved towards either the work from home or online classes set-up because of the pandemic. Previous mobile technologies can no longer meet the high speed, and bandwidth requirement needed, given the drastic shift of transactions to the home. The millimeter-wave (mmWave) underutilized frequency is utilized by the fifth-generation (5G) cellular networks that support multi-gigabit-per-second (Gbps) transmission. However, due to its short wavelengths, high path loss, directivity, blockage sensitivity, and narrow beamwidth are some of the technical challenges that need to be addressed. Different tools, technologies, and scenarios are explored to support network design, accurate channel modeling, implementation, and deployment effectively. However, there is a big challenge on how the consumer will adopt this solution and maximize the benefits offered by the 5G Technology. This research proposes to study the intricacies of technology diffusion, individual attitude, behaviors, and how technology adoption will be attained. The agent based simulation model shaped by the actual applications, technology solution, and related literature was used to arrive at a computational model. The research examines the different attributes, factors, and intricacies that can affect each identified agent towards technology adoption.
Keywords : agent-based model, AnyLogic, 5G O21, 5G mmWave solutions, technology adoption
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