

Beamforming for Future Wireless Communication Systems: A Survey

Description: The continuing trend towards higher data rates in wireless communication systems will, in addition to higher spectral efficiency and lowest signal processing latencies, lead to higher throughput requirements for digital signal processing. Fifth generation (5G) will support the need for more data applications, higher speeds, more capacity, lower latency and increased performance. New cellular architectures and technologies are being investigated in order to meet the growing demand for wireless services. One example is the use of beamforming. Beamforming is a signal processing technique used to direct the transmission or reception of signals. Directional beamforming is produced by adjusting the elements of each antenna vector, until an optimal gain is obtained. Massive multiple-input multiple-output (MIMO) systems combined with beamforming antenna array technologies are expected to play a key role in next-generation wireless communication systems.

The main objective of my project is to analyze the beamforming technology and surveyed the beamforming methods used over the years in various wireless applications and how it can be improved to be implemented in future technologies. Discuss the state-of-the-art research on the most favorable types of beamforming techniques that can be deployed in massive MIMO systems consist on the evaluation of the performance of a 5G communication system, using massive MIMO technology embedded with digital beamforming techniques. A comparison of two digital beamforming methods proposed for future 5G systems, EBB and GoB beamforming, is assessed. Then provide a review of the research going into this field on how the application of the technology can be employed in the future standards to provide a better user experience.