substantial data such as photos or videos. While there may be a cost associated with transmission, it is a factor that cannot be ignored. While the coverage of a Wi-Fi network tends to be limited, resulting in lower availability, the user's mobile mode plays a crucial role in determining its accessibility [22]. Hence, the implementation of 5G and 6G technologies can offer valuable assistance in gathering sensory data.

5G APPLICATIONS IN 6G

The upcoming 6G mobile networks will redefine the existing 5G application types, such as massive Machine Type Communications (mMTC), Ultra-Reliable Low Latency Communications (URLLC), and enhanced Mobile Broadband (eMBB). This redefinition is necessary to accommodate more demanding applications like holographic telepresence and immersive communication, while also meeting stricter application requirements along the edge-cloud continuum. The introduction of these new applications will raise expectations for performance, reliability, ubiquity, trustworthiness, security, openness, and sustainability. As a result, the boundaries of innovation will be pushed, leading to transformative changes in the architecture of future mobile networks.
In order to meet these new expectations, we will need a completely new ecosystem co-design combining communication, control and computing functions, something that has been largely neglected to date. We will need seamless approaches to transform wireless systems into an autonomous, intelligent network fabric that can flexibly provision and orchestrate communications-computing, control-localisation and sensing resources that are tailored to the required scenario. This means that the mobile communications fabric of the future will have to be differently designed to meet the new, demanding applications that can’t be served by today’s 5G mobile network. The network evolution can happen in many different ways.

CHALLENGES IN 6G

6G is still in its early stages of innovation and standardisation, but there are a number of challenges researchers and engineers will likely encounter as they work to bring this technology to life. Here are some of them:

DEVICE CAPABILITIES :

New generations of wireless communication technologies, such as 6G, introduce a wide range of advanced features and capabilities, including higher data rates, lower latency, increased reliability, and support for massive connectivity. Implementing these features requires the integration of complex algorithms, protocols, and hardware components. 6G is expected to leverage advanced multiplexing techniques such as massive MIMO (Multiple Input Multiple Output), beamforming, and spatial division multiplexing to increase spectral efficiency and capacity. Managing the spatial, frequency, and time-domain aspects of these techniques adds to the complexity of 6G networks. Terahertz frequencies are being explored for 6G communication due to their potential for ultra-high data rates. However, terahertz communication presents several technical challenges, including propagation losses, atmospheric absorption, and material interactions. Overcoming these challenges requires novel antenna designs, signal processing algorithms, and modulation schemes. 6G is expected to feature intelligent and autonomous network management capabilities enabled by artificial intelligence (AI) and machine learning (ML) technologies. These intelligent networks will dynamically adapt to changing conditions,