

## APPLICATION OF 5G

*This article introduces what is 5G, the development of 5G and 5G's application in our life.*

### INTRODUCTION

In the 2G and 3G eras, people are connected and the downstream application are mobile phones. In the 4G era, it has begun to expand from connecting people to people and things, but many applications cannot be large-scale due to network delay and speed. In the 5G era, network speed will increase by more than 10-100 times, and the transmission cost per bit will be greatly reduced. This will open a large-scale era of connected things. The IoT, autonomous driving, VR/AR, etc.

#### I. THE SYNOPSIS AND FEATURES OF 5G

The 5G network is a digital cellular network. The analog signals that represent sound and images are digitized in the mobile phone, converted by an analog-to-digital converter, and transmitted as a bit stream. All 5G wireless devices in the cell communicate with the local antenna array and low-power automatic transceivers in the cell through radio waves. The transceiver allocates frequency channels from a common frequency pool, which can be reused in geographically separated cells. The local antenna is connected to the telephone network and the Internet through a high-bandwidth optical fiber or wireless return trip connection. Like existing mobile phones, when users traverse from one cell to another, their mobile device will automatically «switch» to the antenna in the new cell. Here are its main features:

- The air interface delay level needs to be around 1ms to meet real-time applications such as autonomous driving and telemedicine.
- The large network capacity provides the connection capacity of hundreds of billions of devices to meet the IoT communication.
- The spectrum efficiency is more than 10 times higher than that of LTE.
- With continuous wide-area coverage and high mobility, the user experience rate reaches 100Mbit/s.

*Tu Xinyuan*, undergraduate of the Faculty of Information Technology and Control of BSUIR, 1065582542@qq.com

*Xiao Feiyu*, undergraduate of the Faculty of Information Technology and Control of BSUIR, 2449291739@qq.com

*Guo Qiang*, undergraduate of the Faculty of Information Technology and Control of BSUIR, 2549518972@qq.com

*Gurinovich Alevtina*, PhD in Physics and Mathematics, Vice Dean of FITandC, BSUIR, gurinovich@bsuir.by.

- The flow density and connection number density are greatly improved.
- The level of system coordination and intelligence is improved, which is manifested in the collaborative networking of multi-user, multi-point, multi-antenna, and multi-ingest, as well as flexible and automatic adjustments between networks.

#### II. APPLICATION OF 5G

With the gradual development of 5G in the world, it will be widely used to promote the relationships. The 5G integrated application system includes three directions: industrial digitalization, smart life, and digital governance. First, in terms of smart life, 5G not only supports entertainment services, but also provides a «non-stuck, no-turn», movie-watching experience and «immersive experience». It also brings new ways of life and work such as smart home and cloud desktop. Second, in terms of digital governance, 5G brings new smart applications to industries such as urban management, lighting, meter reading, autopilot, parking, public safety and emergency response, improve social governance capabilities and efficiency. Third, in terms of industrial digitization, 5G integrates development with industries such as industry, medical care, transportation, finance, and education, and integrates into R&D, production, management, and services to meet the needs of people, materials, and machines. By reshaping the traditional industry development model, the industry becomes more digital, networked and intelligent.

#### III. FUTURE DEVELOPMENT OF 5G

In the past few years, 5G has given new vitality in many new application fields, such as cloud game, high-speed download and IoT.

Internet of Vehicles

Smart medical

Industrial Internet

Wisdom education

Neural Networks and Machine Learning

VR/AR