程序代写代做 CS编程辅导

COMP93 Mobile Data Networking

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*ted to **Moodle***

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Trends

in Mobile Data Networking

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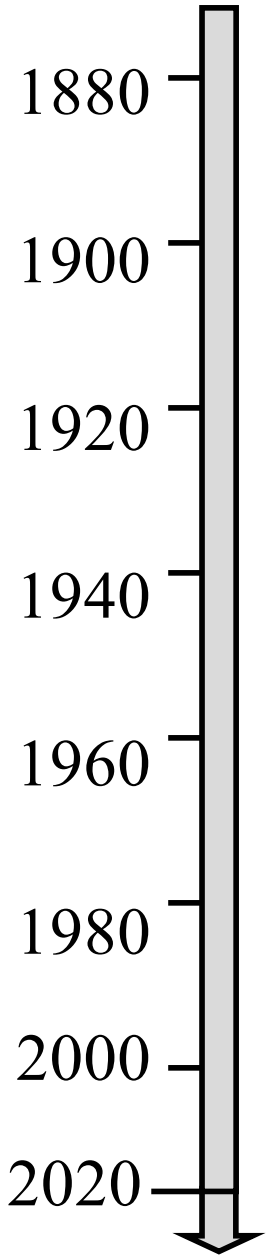
Wireless/Mobile History 1880 - 2020



- 1880: Hertz discovered electromagnetic waves
- 1898: First commercial radio data service
- 1921: First Mobile Radio: Wireless dispatch system for Detroit Police
- 1946: First Mobile Telephone Service: Push to talk.
- 1970: First Cellular Phone Service
- 1971: First Wireless Data Network
- 1990: First Commercial WLAN Product 1997: First WLAN Standard - IEEE 802.11 2Mbps
- 2020: WLAN 5/6, Bluetooth 5.0, 5G

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Access is all wireless

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- Wireless, in the form of WiFi, started in 1999.
  - First it was a
  - Now it is standard in all computing devices
- Most of the access (end user connectivity) is wireless
- Mobile phones, tablets have multiple wireless technologies: WiFi, Bluetooth, Cellular, but *no wired connectivity*

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Most Revenue in Wireless

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- US Wireless industr[illegible]at $195.5 billion ≥ publishing, agriculture, hotels a[illegible]air transportation, and motion picture and recording.
- Wireless industry di[illegible]ectly provides more than 2.6% of all US employment
- Wireless revenue is expanding

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Ref: http://www.ctia.org/your-wireless-life/how-wireless-works/wireless-quick-facts

http://atlantic-acm.com/index.php?option=com_content&view=article&id=557%3Avisual-dataline-us-telecom-wireless-and-wireline-service-revenues-2010-2015&catid=46%3A2010-datalines&Itemid=20

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Mobile speed forecast

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CISCO annual report 2018-2023

- **Wi-Fi speed will t[illegible]23**. Globally, the average Wi-Fi speeds will grow from 30.[illegible]018 to 92 Mbps by 2023.
- **Cellular speeds will more than triple by 2023**. The average mobile network connection speed was 13.2 Mbps in 2018 and will be 43.9 Mbps by 2023.
- The average 5G connection speed will reach 575 Mbps by 2023.

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The incredible momentum of WiFi

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CISCO report

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- **Wi-Fi hotspots will grow four-fold from 2018 to 2023**. Globally, there will be nearly 628 million public Wi-Fi hotspots by 2023, up from 169 million hotspots in 2018.
- **Wi-Fi6 hotspots will grow 13-fold from 2020 to 2023** and will be 11 percent of all public Wi-Fi hotspots by 2023.

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WiFi evolution

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Mobile growth forecast

CISCO annual report 2018-2023

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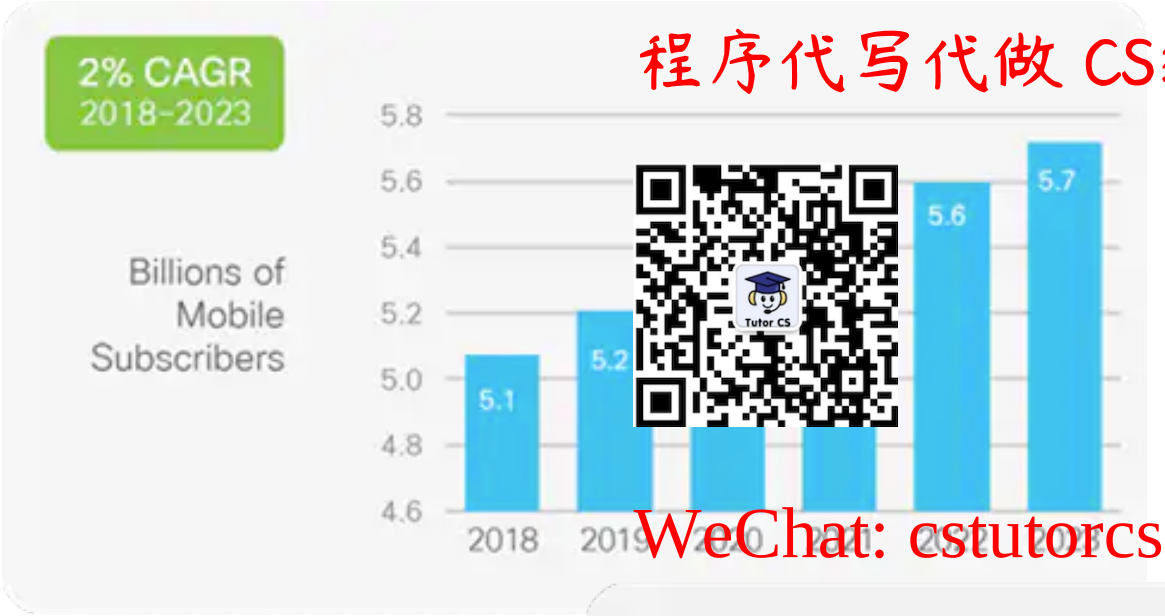

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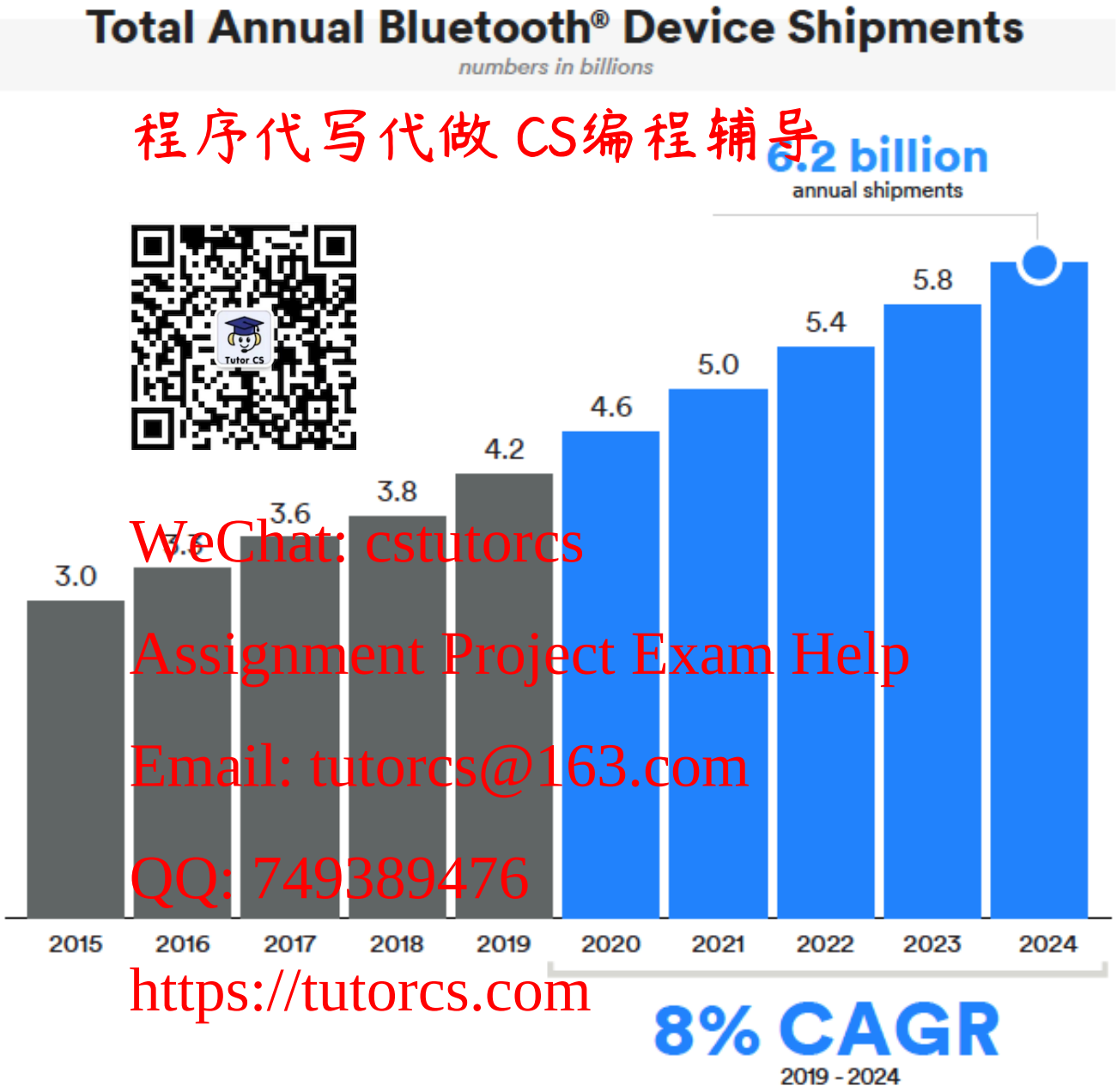
Bluetooth revolution



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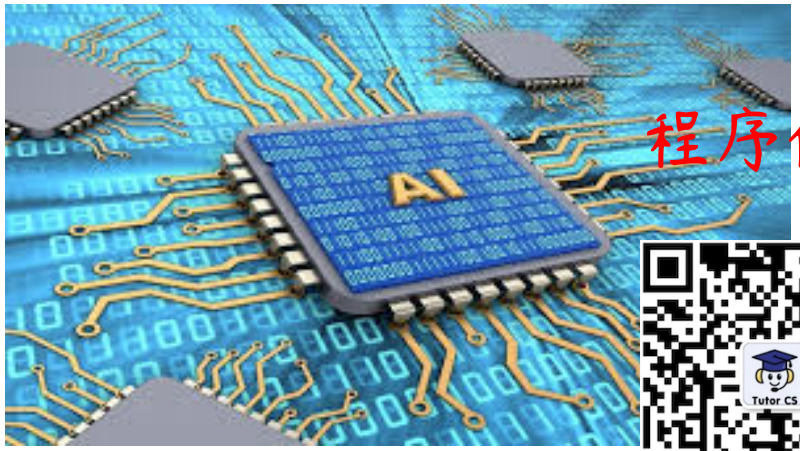

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Other trends
New developments

- AI (artificial intelligence) in mobile networking
- Sensor-aided mobile networking
- Drone-aided mobile networking
- Programmable wireless environment
- Simultaneous wireless information and power transfer
- Terahertz wireless networking
- Nanoscale wireless sensor networking
- …

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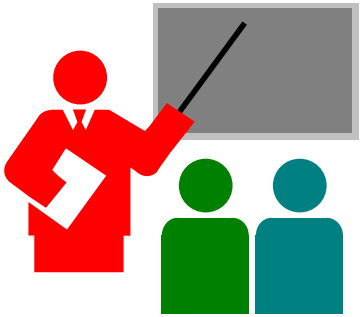

Summary: wireless and mobile trends

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1. WiFi has grown worldwide in just 15 years and continues to develop in capacity with innovations in PHY and data link layer
2. Bluetooth has reached the 5 billion milestone in 2020
3. 5th generation of cellular technology is already here in 2020 with massive capacity and new features
4. Wireless speed growth is following Moore's Law
5. Mobile subscriptions are approaching world population
6. Many innovative new technologies are being developed to meet the unabated demand in wireless and mobile communications

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