KOENIG
step forward

Wearable Technology and Wireless Networks

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Networks

Module 1: Introduction to Wearable Technology

- Overview of wearable technology: history, evolution, and trends
- Wearable communication technologies and standards: Bluetooth, Wi-Fi, cellular, and more
- Wearable technology architecture and design principles: sensors, actuators, microcontrollers, and wireless communication
- Wearable technology components: power management, display, user interface, and software platforms
- Hands-on practical: Building a simple wearable device using Arduino and Bluetooth module.

Module 2: Wireless Networking for Wearables

- Overview of wireless networking for wearables: challenges, opportunities, and trends
- Wireless networking technologies for wearables: Bluetooth Low Energy (BLE), Zigbee, and Wi-Fi Direct
- Wireless networking protocols and standards for wearables: Bluetooth 5, IEEE 802.15.4, and 6LoWPAN
- Wireless networking design and deployment for wearables: access points, mesh networks, and range extenders
- Hands-on practical: Designing and deploying a wireless network for wearables using BLE and Raspberry Pi.

Module 3: Wearable Sensors and Data Management

- Overview of wearable sensors: types, characteristics, and applications
- Wearable sensor data acquisition: sampling rates, resolution, and filtering
- Wearable sensor data processing and analysis: feature extraction, pattern recognition, and machine learning
- Wearable data management: data storage, transmission, and visualization
- Hands-on practical: Collecting and analyzing wearable sensor data using Arduino.

Module 4: Wearable Security and Privacy

- Wearable security fundamentals: authentication, encryption, and access control
- Wearable security threats: data breaches, unauthorized access, and physical tampering
- Wearable security protocols and standards: BLE security, NFC pairing, and TLS encryption
- Wearable privacy issues: data ownership, consent, and transparency
- Hands-on practical: Securing a wearable device using BLE security and NFC pairing.

Module 5: Wearable Technology and Wireless Network Integration
- Overview of wearable technology and its integration with wireless networks
- Wearable technology communication protocols: Bluetooth, Zigbee, and Wi-Fi Direct
- Integration of wearable technology with wireless networks: challenges and opportunities
- Wearable technology applications in healthcare, fitness, and entertainment
- Hands-on practical: Integrating a wearable device with a wireless network and developing a simple application.

Module 6: Wearable Sensors and Data Management
- Overview of wearable sensors: types, characteristics, and applications
- Wearable sensor data acquisition: sampling rates, resolution, and filtering
- Wearable sensor data processing and analysis: feature extraction, pattern recognition, and machine learning
- Wearable data management: data storage, transmission, and visualization
- Hands-on practical: Collecting and analyzing wearable sensor data using Arduino and MATLAB.

Module 7: Wearable Security and Privacy
- Wearable security fundamentals: authentication, encryption, and access control
- Wearable security threats: data breaches, unauthorized access, and physical tampering
- Wearable security protocols and standards: BLE security, NFC pairing, and TLS encryption
- Wearable privacy issues: data ownership, consent, and transparency
- Hands-on practical: Securing a wearable device using BLE security and NFC pairing.

Module 8: Wearable Technology and Wireless Network Integration
- Overview of wearable technology and its integration with wireless networks
- Wearable technology communication protocols: Bluetooth, Zigbee, and Wi-Fi Direct
- Integration of wearable technology with wireless networks: challenges and opportunities
- Wearable technology applications in healthcare, fitness, and entertainment
- Hands-on practical: Integrating a wearable device with a wireless network and developing a simple application.