Wenqing Cui

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Education

Harbin Institute of Technology
Bachelor in **Electronic Information Engineering** 2019 – 2023
GPA: 88/100, RANK: TOP 10%

King Abdullah University of Science and Technology
Master student in **Electrical and Computer Engineering** 2023 – Present

Honors

First-Class Academic Scholarship (**Top 3**% students in each class) 2020
Outstanding Student Leader (**Top 3**% students from all majors for their outstanding leadership.) 2021
Merit and Ability Scholarship (Dean nominated,**Top 0.2**% students from all majors.) 2022
Outstanding Graduate of Harbin Institute of Technology 2023

Publications

Handwriting Number Recognition Based on Millimeter-wave Radar with Dual-view Feature Fusion Network(Published)
Xiang Feng *, Tao liu, **Wenqing Cui**, Fengcong li, Yinan Zhao
Journal of Electronics & Information Technology, 2022.

Research experience

Enhancing Speaker Verification with Millimeter Wave Radar and Vocal Cord Analysis
Details:This research outlines a novel speaker verification system that integrates high-resolution millimeter wave radar with vocal cord vibration analysis. By utilizing radar to detect vocal cord vibrations during speech, the system processes reflected signals with a Fast Fourier Transform (FFT) to isolate phase information. This data is used to identify distinct biometric features from speech segments, which are analyzed by a attention-enhanced Bidirectional Long Short-Term Memory (Bi-LSTM) network for accurate speaker verification. This approach offers a sophisticated, non-invasive solution for secure individual authentication through unique speech patterns.

FPGA-Powered Airhockey Duel: An Interactive Gaming Experience
Details:In this project, we implemented an Airhockey game using the Nexys A7-100T FPGA board. The game is designed to be interactive, utilizing two matrix keyboards as input devices for players to control their paddles. For the visual aspect, the game generates VGA signals to display the game interface, including the puck, paddles, and scoring, on a VGA monitor. This setup not only demonstrates the FPGA's capability to handle real-time inputs and outputs but also showcases the potential for creating engaging, hardware-accelerated games.

UAV Tracking System based on OPENMV

Details:This study presents the development of a UAV (Unmanned Aerial Vehicle) tracking system, leveraging the OPENMV platform for precise target monitoring. The system is built upon a quadcopter testbed equipped with PIXHAWK flight control hardware, augmented by miniature LIDAR and optical flow sensors to maintain stability and navigation at elevated altitudes. Target tracking is achieved through the implementation of the Hough circle change algorithm, which identifies and locates specific shapes. Additionally, a negative feedback control mechanism is employed to maintain the UAV's position directly above the target, ensuring continuous and accurate monitoring. This innovative approach provides a robust solution for UAV-based surveillance and tracking applications.

JPEG Image Compression System

Details:This research introduces an advanced JPEG image compression system implemented in MATLAB, grounded on the JPEG compression standard. The process begins with the extraction of a segment from the target image, followed by a Discrete Cosine Transform (DCT) of the image segment. Subsequently, quantization is performed using a predefined table. The system further enhances compression through differential encoding of the DC component, run-length encoding of the AC components, and concluding with Huffman encoding of the entire dataset. This comprehensive process results in a significantly compressed image while also enabling the evaluation of the achieved compression level. This system demonstrates a practical application of JPEG standards in achieving efficient image compression.

Voice Change Processing System

Details:This study introduces a comprehensive voice change processing system developed in MATLAB, which capitalizes on the short-term stationarity characteristic of speech signals. The system processes collected speech signals on a frame-by-frame basis, utilizing the Linear Predictive Coding (LPC) method to calculate prediction coefficients. By modifying the pitch period, it facilitates the creation of various voice-changing effects. Furthermore, the system features a Graphical User Interface (GUI) that consolidates audio acquisition, spectrum analysis, and voice change processing into a single, user-friendly platform. This integration allows for the seamless generation of altered voice outputs, such as children's voices, female voices, and sloth voices, among others.

Skills

Programming :Matlab, C, Verilog, Python.

Languages :Mandarin (native), English (**C1, IELTS:7.0**)