微型电脑应用

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China)

Abstract: With the rapid development of agriculture production technology, it is in urgent need of a general, reliable, effective and real-time acquisition system for farmland microclimate parameters. It will improve cognition of the relationship between the crop growth and the microclimate, and service the agriculture production as well. This paper mainly introduced the protable equipment of microclimate information acquisition system based on microcomputer and made a detailed description on data acquisition methods and system's software and hardware structure. It can real-time monitor 15 kinds of parameters automatically, including temperature, humidity, light intensity, rainfall, evaporation, atmospheric pressure, etc. The practice proved that the protable equipment is possessed of reasonable design and reliable performance. As the main part of microclimate information acquisition system, it will be a general machine suitable for automatic monitoring of farmland microclimate parameters.
Key words: Farmland Microclimate; PIC18F87J10; Data Acquisition; SD Card

An Approach to Palm-dorsal Vein Recognition Based on Local Gabor Phase Feature ·················· (23)
ZHENG Yingjie, GU Xiaodong (Department of Electronic and Engineering, FuDan University, Shanghai 200433, China)
Abstract: This paper presents a new approach to palm-dorsal vein recognition. In contrast to the existing methods, our method employs low-resolution palm-dorsal vein images to achieve effective identification. This method consists of two parts: one part is the palm-dorsal image preprocessing and region of interest (ROI) extraction, the other part is vein feature extraction and verification, using local 2D Gabor phase encoding variance feature to represent the texture feature of the vein image and using histogram to represent the global feature. Chi-square distance is used to evaluate the matching degree. On our own palm-dorsal vein image database, experimental results show that this method achieves 100% acceptance rate and 0% false refuse rate, which indicates the vein pattern biometric is potentially a useful biometric.
Key words: Palm-dorsal Vein Recognition; Feature Extraction and Verification; Gabor Phase Encoding; Chi-Square Distance

DEVELOPMENT AND APPLICATION

A Motion Detection and Tracking Integrated Intelligent Surveillance System ·················· (27)
Deng Zhihui, Lu Linji (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)
Abstract: In the last few years, intelligent surveillance has become one of the most active research areas in computer vision. In this paper, a visual surveillance system is present that is based on the integration of motion detection and visual tracking, which is able to automatically track varying number of targets and automatically complete the initialization and termination of the track. Firstly, a thresholding background subtraction approach based color space model is used to find moving object. Secondly, the moving object is tracked by MCMC based particle filter. Meanwhile, a global nearest neighbor approach is applied as data association in multiple object tracking. Finally, an intelligent video surveillant platform is design using OpenCV on PC. The experiment results show that the system can detect and track varying number of targets rapidly and effectively.
Key words: Motion Detection; Multiple Object Tracking; Particle Filter; MCMC; Global Nearest Neighbor

Open Set Face Recognition Approach Based on Similarity Space Division ·················· (31)
Zhang Kai (Department of Automation, Shanghai Jiaotong University, Shanghai200240, China)
Abstract: This paper studies a novel classification algorithm based on similarity space division to enhance the accuracy in open set face recognition. In this algorithm, open set problem is transformed to a 2-class classification problem, and a hyper plane is searched to divide the similarity space and separate vectors of the 2-class. Then the algorithm rejects the unknown identity by the relative position of the hyper plane. Hence, the feature has strong classification ability, in view of the discrimination information abstracted from the similarity space. Experimental results on several face databases demonstrate that similarity space division based method in this paper significantly outperforms the traditional method for open set face recognition.
Key words: Face Recognition; Open Set; Similarity Space

Human Tracking in Multi-Scene Video Surveillance ·················· (33)
Weng Fei, Liu Yuncai (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)
Abstract: This work presents a real-time system which detects and tracks human object passing through several non-overlapping cameras. It segments moving objects and extracts their features for every camera, and assigns tracking tasks to related cameras according to known topologic information when an object leaves a camera's view. When an object enters a camera which is under surveillance, object matching is carried out. In this way, people are tracked continually in multi-camera system. Experiments show that this system can track people across disjoint cameras timely and robustly.
Key words: Video Surveillance; Non-overlapping Multi-camera; Object Tracking

Development of Process Monitoring System of Treatment Equipment for Recycling Crushed Waste Printed Circuit Board Based on Labview ·················· (36)
ZHOU Quan, LI Jia, XU Zhenmin (School of Environmental Science and Engineering, Shanghai Jiaotong University, Shanghai 200240, China)
Abstract: The feeding rate of recycling crushed waste printed circuit board has always been a tough problem in actual treating process. However, further research on this problem cannot be reviewed in China as well as how to monitor the continuous process.This paper proposes a solution aimming at the problem mentioned above. The solution is based on monitoring continuous process status via monitoring middling fraction (mixed by conductor fraction and nonconductor fraction). A new data acquisition and analysis system based on LabVIEW is developed, and its designing procedure including software and hardware is also given as well as experimental results. This system can meet the requirement of experiment for its advantages: friendly user interface and easily operation, real-time monitoring and steady performance.
Key words: Waste Printed Circuit Board; Labview; Real-time Monitoring

TECHNICAL COMMUNICATION

Design of the Photoelectric Synthetic Toxicity Detector ·················· (39)
LIU Gang, XU Li-rong, PAN Xi-ming, YUAN Jing-qi (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)
Abstract: For the purpose of safety of drinking water supply, a photoelectric synthetic toxicity detector is presented. The luciferin-luciferase's reaction system may emit fluorescence, while the toxic substances will suppress the luminous intensity. By calculating the inhibition of the luminous intensity, toxic intensity may be estimated if the luminous intensity is detectable. Using photoelectric multiplier tube as luminous intensity detection device, a photoelectric synthetic toxicity detector is designed. The experiment results demonstrate that the prototype detector may be used to detect biological toxicities in the water samples quickly and accurately.
Key words: Photoelectric; Toxicity Detection; Luminous Intensity; Photoelectric Multiplier Tube

Study for Dynamic Model Simulation of Gas Turbines Based on MATLAB/SIMULINK ·· (41)

Chang Jun, Qu Weidong (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: This paper establish one nonlinear dynamic model of gas turbines using object-oriented technique based on MATLAB/SIMULINK, that is design several main component models of gas turbines, then build up a dynamic simulation model of gas turbines taking the volume inertia into account; The study shows that, the model can reflect the transient characteristic of gas turbines intensively, and it can be used for the simulation in the processes such as acceleration, deceleration, and so on.
Key words: MATLAB/SIMULINK; Object-Oriented; Gas Turbines; Simulation Study

Structure Analysis in Chinese-English Machine Translation ··· (45)

Zhang Ying, Zhu Lanjuan (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: Based on the theory of dependence tree and Case Grammar, the machine translation software is developed which is designed to interpret complicated Chinese sentences into English, especially for those formal sentences of standard grammar and common idioms. The feature of the software is analysing the "truck" of sentences with the help of the adverbial module. Focus on the analysis of other complex modified ingredients of the sentences. As examples of adverbial and noun structures' analysis, most structure can be integrated into applicable expression and the attributes of words are alternative according to Chinese grammar system and semantic knowledge. Finally, the specific algorithm of the rule base is proposed and the solution is given by means of the software whose practicability and effectivity is tested.
Key words: Dependence Tree; Case Grammar; Case Frame; Morpheme; Semantic Group

Design of the Efficient Database Connection Pool Based on the Queuing Theory ··· (48)

WANG Yujie, YANG Wenbin, (Information Center, Beijing Jiaotong University, Beijing 100044, China)

Abstract: Access to the database connection pool used in the handling of concurrent performance very edge. This paper presents a common connection pool of technologies, including connection pooling, manager, monitor, and configuration files, and a few parts, and the design of the monitor, combined with queuing theory, an access service model for optimize the quality of service connection pooling to achieve better access performance. The design has been applied in many systems, stable operation, and access efficiency.
Key words: Connection Pool; Queuing Theory; Database

Application of Neural Network in Predicting the Price of Initial Public Offerings ······································· (51)

Xia Yu (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: With the overall prosperity and the further maturity of marketing economy in China and the world at large, in current, people are showing great interest in optimizing the financial analyses and decision-making processes by means of artificial neural network. The result of the neural network model initiated in this research can be assessed and compared by the price made by multiple propagating methodologies. The result reveals that the prediction made by the artificial neural network is much better than that made by the multiple regression algorithms.
Key words: Artificial Neural Network; Initial Public Offerings; Back-propagating Network

Applied Support Vector Machines to Gas Turbine Fault Diagnosis ·· (55)

Wan Xiang, Qu Weidong (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: This paper applies SVM algorithm into fault diagnosis of gas turbine. By using SVM, can get normal pattern and several fault patterns, and then compute whether the real timely measured parameters matches any known pattern. In this method, can decide whether fault happens and tell its type and calculate the fault degree of membership through SVM function value. Example demonstrates that this method is applicable for fault diagnosis of gas turbine.
Key words: Gas Turbine; SVM; Fault Diagnosis; OTM; Labview

An Improved SLM for PAPR Reduction of OFDM ·· (59)

WANG Yushi[1], LU Xuanmin[1], ZHOU Yajian[2], YOU Jun[1] (1.Faculty of Electronics and Information, Northwestern Polytechnical University, Xi'an 710129, China; 2.Institute of Information Security, Beijing Post and Telecomm. University, Beijing 100876, China)

Abstract: To address the problem that the peak-to-average power ratio (PAPR) in orthogonal frequency-division multiplexing (OFDM) systems is too high, an improved selected mapping (SLM) is proposed. By scaling the selected signal's amplitude and packeting the OFDM symbols in the transmitter, the improved SLM saves the system's bandwidth and reduce the PAPR efficiently with no side information to be sent. At the same time, the random phase sequence information is rapidly recovered by using related detection algorithm, which largely raises the detective efficiency in the receiver. The simulation results show that the improved SLM could reduce the PAPR more efficiently while the bit error rate (BER) is similar to the one of the typical SLM.
Key words: OFDM; Peak-to-average Power Ratio; Selected Mapping; Detect Side Information

Application of Ajax in Task-driven VFP Network Teaching System ··(62)

GAO Wei, GUO Jin, LIU Deshan, XU Benqiang (School of Computer and Information Technology, Liaoning Normal University, Dalian 116081, China)

Abstract: *In the paper, the functions of task-driven Visual FoxPro network teaching system including online answer, online examination, user management, network courseware, and communication platform are analyzed and implemented. The technology of Ajax is used to implement show client page without refresh, control examination time by servers, and transfer answers of examination to servers in real time and other functions. The result of test shows that comparing with B/S structure, Ajax structure can greatly increase visit efficiency and maintainability.*
Key words: Ajax; Page of No Refresh; Real Time; B/S Structure