

微型电脑应用

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EXPERT FORUM**Application of Nature-inspired Computation in Nine High-tech Fields..... (1)***Zhang Yongwei, Wang Lei, Wu Qidi(College of Electronics and Information Engineering, Tongji University, Shanghai 201804, China)*

Abstract: The scope of the key nine high-tech fields of Shanghai and the contents of nature-inspired computation are introduced, the state-of-the-art applications of Natural-inspired Computation technology in the key nine high-tech fields, including domestic and foreign, are summarized. The advantages and disadvantages between the corresponding domestic and foreign research fields are compared and the suggestion for improvement is given. Finally, the further application prospects is summarized and forecasted.

Key words: Nine High-tech Fields; Nature-inspired Computation; Evolution Computation; Swarm Intelligence; New Energy; Manufactory Industry; New Material

RESEARCH AND DESIGN**Study on Simulation Platform for Intelligent Vehicles Interaction..... (8)***Wan Nianfeng, Sun Yifei(School of Electronic Information and Electrical Engineering, Shanghai Jiaotong University, Shanghai 200240, China)*

Abstract: This paper designs a simulation platform for intelligent vehicle interaction, to test the efficiency of algorithm without the traffic signal and the classical algorithm. The platform is proved to be appropriate for many kinds of intersections, and the algorithm increased the traffic efficiency, shortened the length of the vehicles queue, and reduced the average waiting time.

Key words: Intelligent Vehicle; Intersection; Cooperation Algorithm; Simulation Platform for Interaction

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Abstract: Nowadays, wireless video transmission technique has been widely used in various communication systems. However, it is "complex" and "expensive" to test the performance of a wireless video transmission system in real field experiments. Therefore, according to the requirements of our project, a wireless video transmission test bed is designed and implemented based on an embedded wireless channel emulator. In the test bed, encoded video stream is transmitted from a PC to the wireless channel emulator, which processes the input video stream according to a given wireless channel model. Finally, the processed video data is transmitted back to the PC, where the video data is decompressed and the transmission performance is evaluated. Extensive experiments have been done by using our test bed. It shows that the system meets all the design requirements and can serve as a good solution for testing transmission performance of various wireless video systems.

Key words: Embedded System; Wireless Channel Emulator; Wireless Video Systems; Ethernet

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Abstract: According to the principle of measuring velocity of Quadrature Encoder and in the analysis of measurement error and resolution based on M velocity method, this paper proposed a new way of an improved precision measurement method-Improved M velocity method, simultaneous measurement of orthogonal two groups of pulse sequences rising and falling edges. This article also provides virtual instrumentation software and hardware design and its experimental results based on a suitable industrial site environmental conditions and quadrature encoder speed algorithm.

Key words: Accuracy of Measuring Velocity; Quadrature Encoder; M Velocity Method; Virtual Instrument

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Key words: Network Access Control; Active-directory; VMPS Protocol; Dynamic Vlan Assignment

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Abstract: Orthogonal Frequency Division Multiplexing (OFDM) is used in fourth generation mobile communication system. The channel estimation of OFDM is a key technology. This paper summarizes the algorithms of channel estimation techniques based on pilot, at the same time it studies the LS, MMSE and improved LMMSE algorithm theories and application in channel estimation in OFDM system. This paper analyzes and discusses the channel

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Key Words: OFDM; Channel Estimation; Pilot

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Jiang Yilian (ShanXi Radio and TV University, Technology Department, Xian 710068, China)

Abstract: This paper mainly introduces a windows server performance monitor system, which is a subsystem of IT resource management system. The system can monitor the performance of server in real time, and provides the graphics display and alarm of the performance data when they beyond the limitation. The system has three layers, and its chief business is implemented in web server. In addition, this paper introduces the key techniques which involve in implementation of system: data collection, communication and graphics display and so on. The techniques which are introduced in the paper can be used for reference in developing semblable software.

Key words: Windows Server; Performance Monitor; PDH

DEVELOPMENT AND APPLICATION

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Mei Ting, Li Jianxun(Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)

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Key words: Kalman Filter; Maximum Likelihood Estimation; Random Walk; Time-varying Risk Coefficient

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Huang Yuntian(Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)

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Key words: Torque Sensor; Static Calibration; Manipulator; Collision Detection

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Pan Jie, Xiong Huilin (School of Electronic Information and Electrical Engineering, Shanghai Jiaotong University, Shanghai 200240)

Abstract: Object detection and tracking is one of the most popular and important issues in the domain of computer vision. The AdaBoost algorithm based on cascade structure and the Camshift algorithm based on color feature are recognized as one of the most effective approaches for face detection and tracking. This paper propose to combine the AdaBoost algorithm, Camshift algorithm with the Kalman filtering algorithm to implement multi-view face detection and tracking in video sequences. A modified AdaBoost algorithm was proposed to reduce the training time, and meanwhile, guaranteed the detection accuracy.

Key words: AdaBoost; Camshift; Kalman Filtering; Skin Color Feature

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Gao Jianguang (School of Software, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: Because of fussy calculate in the course of fitting a thrice B-spline curve by four points. This paper put forward a simple arithmetic of secondary B-spline curve fitting. That is to say thrice B-spline curve is replaced with two secondary B-spline curves that can produce simple compute, satisfactory slick degree and quick speed.

Key words: Double Circular; B-spline Curve; Secondary Curve; Fiting Algorithm

TECHNICAL COMMUNICATION

Application of Improved K-means Algorithm in The Customer Segmentation Of B2C E-commerce (39)

Shi Hongjun, Han Bing (Automation Department, Shanghai Jiaotong University, Shanghai 21004)

Abstract: Customer segmentation is the foundation for accurately making marketing strategies and successfully managing groups of customers. But the higher requirements are proposed with the development of the Internet and the e-commerce. A new K-means algorithm is proposed to find the initial clustering center with the consideration of the density and the distance. The new methods to divide the customer's database are used. Experiments demonstrate that the proposed method can produce a high purity clustering result and the result is useful for marketing strategies.

Key words: Data Mining; K-means Algorithm; Customer Segmentation

Background Modeling Based on Fusion of Mixture Gaussian Model and LBP Texture Model..... (42)

Liu Quanzhi, Hu Fuqiao(School of Electronic Information and Electric Engineering, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: This paper present a novel non-parametric foreground-background model which explores the complex temporal and spatial dependencies in non-stationary scenes. The model adapts to scenes which contain small motions. The Model uses GMM(Gaussian Mixture Model) to compute the probability of foreground d pixel with color information. It also uses LBP(Local Binary Pattern) texture model to compute the probability of foreground pixel with texture information. Finally, it uses data fusion algorithm named D-S evidence theory to do an information fusion in the decision level. Extensive experiments with non-stationary scenes demonstrate the utility and performance of the proposed approach.

Key words: Object Detection; GMM; LBP Texture Model; D-S Evidence Theory

Human-guided Mapping Technology of Mobile Robots..... (45)

Yang Guangming (Department of Automation, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: The technology that a mobile robot can build environment map accurately is of fundamental sense for it to locate itself precisely and accomplish other tasks. Thus, mapping is the key technology in mobile robot area. This article proposes one kind of human-guided mapping algorithm. This technology firstly makes up low efficiency of conventional mapping algorithm which needs explore the environment automatically; secondly, through human-machine interaction, the robot can remember key waypoints in the map, build mixed map of grid map and topological map, which establishes the basis of its navigation.

Key words: Mobile Robot; Mapping; Human-guided; Waypoint

JAVA Based on Fast Sorting (48)

Xing Suping(Nanjing Institute of Industry Technology, Department of Information Engineering, Nanjing 210046, China)

Abstract: This paper describes the importance of sorting the data processing. Use the popular cross-platform object-oriented programming language java implementation of the Quick Sort algorithm and the algorithm is theoretically analyzed.

Key words: Information; Data Structure; Data; Sorting; Java

Research on the Method of Vehicle Features Extraction and Recognition Based on Video..... (50)

Wang Huibin, Lu Rong (College of Computer and Information, Hohai University, Nanjing 210098, China)

Abstract: The key of vehicle recognition is the vehicle features extraction and the classifier design in statistical pattern recognition method. As the vehicles' geometric features such as outline, length, height, area and wheelbase are more difficult to be obtained, this paper firstly select the vehicle image gray matrix, which has more effective information, as the original description features, and then optimize the vehicle identification features with the PCA-LDA method. Secondly, based on support vector machine classification method, this paper construct the three type's vehicle classifier, and combine the KNN method to improve the SVM sub-classifier accuracy further. Finally, simulate the designed methods, the result show that it can obtain better recognition efficiency.

Key words: Image Processing; Vehicle Recognition; Second Feature Extraction; SVM

Fast Infrared Spots Detection Based on FPGA..... (54)

Huang Maoxiang, Liu Yuncai (Institute of Image Processing and Pattern Recognition, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: This paper introduces a fast infrared spots detection algorithm designed for field-programmable gate array (FPGA) implementation. The proposed algorithm processes four pixels per clock cycle and detects infrared spots in a single pass over a frame. The implementation of the algorithm is only composed of combinatorial logic and registers. Further-more, the execution time of the algorithm is independent of image content. For prototyping and evaluation purposes, the algorithm is implemented in an FPGA device. Demonstrated its superiority over the existing multi-pass algorithms and some other one-pass algorithms, it processes 1024×768 images smoothly at 60 fps and detects infrared spots in a 1024×768 image within 1.966ms.

Key words: Infrared Spots; Connected Components; FPGA; Centroid; IEEE 1394b

Processing the Student Result Effectively with Excel..... (58)

Liu Guangfu¹, Yin Aizhen² (1. College of Information and Controlling Engineering; China University of Petroleum(East China), Dongying 257061, China; 2. College of Economics and Management; China University of Petroleum(East China), Dongying 257061, China)

Abstract: Excel, as the powerful spreadsheet software, can apply to student result processing to improve the efficiency and accuracy. This paper made two models of student result processing, by using the Excel functions of citation and INDIRECT to create citation. One of the both models if easy to create with high efficiency, but the efficiency of the other model very high, can process a class only by changing some file parameters. Both models can check the student lists, to avoid mistakes. The application result indicates that the method can improve the efficiency and can be used in lots of curriculums.

Key words: Excel; INDIRECT Function; Model of Student Result

Hair Detection with Mean Shift..... (62)

Fu Wenlin, Hu Fuqiao (Institute of Image Processing and Pattern Recognition, Shanghai Jiaotong University, Shanghai 200240, China)

Abstract: This paper present an algorithm for hair segmentation automatically. Our approach uses mean shift and Gaussian mixture model to detect hair combining color, texture and location feature. The approach is divided into three steps. Firstly, face and eye are detected. Face and eye detection allow us to normalize the face sizes so hair location mask can be used. Secondly, this paper extract hair feature and use mean shift to cluster pixels in order to get some regions. Finally, we use Gaussian mixture model to determine the region whether it's hair region or not. This article demonstrates that our method can precisely detect the hair in different background including varying illumination.

Key words: Gaussian Mixture Model; Mean Shift; Hair Detection

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