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SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS

A Biweekly Publication of the National Aeronautics and Space Administration
VOLUME 44, ISSUE 1 - January 13, 2006

63 CYBERNETICS, ARTIFICIAL INTELLIGENCE AND ROBOTICS
Includes feedback and control theory, information theory, machine learning, and expert systems.

For related information see also *54 Man/System Technology and Life Support.*

NASA STAR REPORTS: 01/13/06
Selected Categories

32 Communications and Radar

44 Energy Production and Conversion

63 Cybernetics, Artificial Intelligence and Robotics

20060001247 National Chung Hsing Univ., Taichung, Taiwan, Province of China

Nonlinear Regulation and Path Tracking of a Wheeled Mobile Robot in Polar Coordinates

Tai-Yu, Wang; Ching-Chih, Tsai; Jia-Lun, Pang; Journal of the Chinese Institute of Engineers; Vol. 28, No. 6; October 2005, pp. 925-934; In English; See also 20060001246 Contract(s)/Grant(s): NSC 93-22 13-E-005-037; Copyright; Avail.: Other Sources

This paper presents regulation and path tracking control methods for wheeled mobile robots (WMRs) associated with kinematic models in two-dimensional polar coordinates. The proposed two regulation control laws are designed via the Lyapunov indirect and direct stability theorems in order to asymptotically achieve nonlinear regulation. With the Lyapunov-based stabilization law, a novel path tracking control method is proposed to achieve reference path following missions on a global scale except for an arbitrary small region around the origin; in particular, two special path tracking examples are analyzed with large initial tracking errors. Computer simulations and experimental results are described to confirm the efficacy of these proposed control approaches. Author

Polar Coordinates; Control Theory; Robots; Kinematics; Computerized Simulation

20060001250 Tung Nan Inst. of Tech., Taipei, Taiwan

Passivity-Based Boundary Control of a Flexible-Link Gantry Robot

Jang, Jenn-Tian; Yuan, King; Journal of the Chinese Institute of Engineers; Vol. 28, No. 6; October 2005, pp. 993-997; In English; See also 20060001246; Copyright; Avail.: Other Sources

In this paper, a new method is proposed for the performance evaluation of a controlled flexible-link gantry robot. The method relies on two mathematical tools: (i) the infinite product representation of transcendental functions, and (ii) the stability properties of a class of irrational passive transfer functions. Exact solutions of the infinite-dimensional, closed-loop, flexible-link gantry system are obtained and compared with the experimental results available in the literature. Author

Gantry Cranes; Robots; Feedback Control

20060001253 National Yunlin Univ. of Science and Technology, Yunlin, Taiwan, Province of China

Navigation of a Mobile Robot in Outdoor Environments

Wu, Chia-Ju; Chien, Ting-Li; Lee, Tsong-Li; Lai, Li-Chun; Journal of the Chinese Institute of Engineers; Vol. 28, No. 6; October 2005, pp. 915-924; In English; See also 20060001246 Contract(s)/Grant(s): NSC93-2213-E-224-001; NSC93-2218-E-224-020; Copyright; Avail.: Other Sources

Implementation of an outdoor navigation system for a mobile robot is described in this paper. In this system, two optical encoders are used to perform dead-reckoning for the mobile robot. Meanwhile, an electronic compass and a GPS receiver are used for self-localization of the robot. Fusing the sensory data from dead-reckoning and self-localization, position and orientation of the robot can be determined accurately. Communication between the robot and the host computer is achieved through GSM modems. In controlling the right and left angular velocities of the robot, a PID control law will be used. For illustration, computer simulation and a practical experiment are presented to show that the outdoor navigation of a mobile robot is feasible, in a convenient and cost-effective manner. Author

Computerized Simulation; Robot Control; Robots; Navigation; Position (Location); Global Positioning System; Control Theory

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20060001258 National Chung Hsing Univ., Taichung, Taiwan, Province of China

3D Posture Determination of a Wheeled Mobile Robot by Fusing Dead-Reckoning and Ultrasonic Measurements

This paper develops a methodology and technique for three-dimensional (3D) posture determination of a mobile robot over uneven terrain. The proposed self localization system is developed by means of integrating a 3D dead-reckoning (DR) sub-system together with a novel ultrasonic localization subsystem for indoor navigation. The extended-Kalman-filter (EKF)-based mutilsensory fusion method is proposed to obtain reliable attitude and position estimates of the vehicle and to eliminate the ac- cumulation errors caused by wheel slippage, surface roughness and wheel misalignment. Experimental results are performed to illustrate the feasibility and effectiveness of the proposed system and method. Author

Robots; Dead Reckoning; Ultrasonics

20060001594 Siemens A.G., Berlin, Germany

Syllable-based Segment-Hypotheses Generation in Fluently Spoken Speech Using Gross Articulatory Features

Syllable based segmentation systems using the energy contour approach are limited to carefully uttered speech. This paper describes a syllable based acoustic-phonetic frontend incorporating knowledge of articulatory aspects of syllable production, in order to detect syllabic nuclei in quickly uttered speech with high reliability. In an iterative procedure hypotheses for syllabic nuclei and their phonetic context are established, using robust gross articulatory classes and features. Remaining intersyllabic consonant clusters are segmented into initial- and final consonant clusters. Due to unavoidable acoustic-phonetic ambiguities alternative segmentations are permitted and several weighted hypotheses for initial and final consonant clusters are produced. Author

Phonetics; Syllables; Acoustics; Articulation (Speech); Iteration

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20060001608 International Business Machines Corp., Rome, Italy

Phoneme Classification for Real Time Speech Recognition of Italian

The development of large dictionary speech recognition systems requires the use of techniques aimed at limiting the search of the correct word to a subset of the vocabulary as small as possible.

An approach to this problem is to create classes of equivalence among words by means of a phoneme classification.

We investigate methods based on the definition of a similarity measure of Hidden Markov Models of phonemes, and on the automatic identification of broad phonetic classes via clustering algorithms.

We discuss the obtained classifications, and their use in a real time speech recognition system for a 3000-word dictionary for Italian; results are compared to those achieved by knowledge based classifications. Author

Phonemes; Speech Recognition; Words (Language); Phonetics

20060001628 Carnegie-Mellon Univ., Pittsburgh, PA, USA

The Lexical Access Component of the CMU Continuous Speech Recognition System

The CMU Lexical Access system hypothesizes words from a phonetic lattice, supplemented by a coarse labelling of the speech signal. Word hypotheses are anchored on syllabic nuclei and are generated independently for different parts of the utterance. Junctures between words are resolved separately, on demand from the Parser module. The lexical representation is generated by rule from baseforms, in a completely automatic process. A description of the various components of the system is provided, as well as performance data. Author

Speech Recognition; Phonetics; Words (Language)

20060001629 Philips Research Labs., Brussels, Belgium

Explicit Time Correlation in Hidden Markov Models for Speech Recognition

The Hidden Markov models are generalized by defining a new emission probability which takes the correlation between successive feature vectors into account. Estimation formulas for the iterative teaming both along Viterbi and Maximum likelihood criteria are presented. Author

Speech Recognition; Markov Processes; Mathematical Models; Algorithms

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20060001630 Ecole Nationale Superieure des Telecommunications, Paris, France

Remora: A Software Architecture for the Collaboration of Different Knowledge Sources in Phonetic Decoding of Continuous Speech

Martelli, Therese; Miclet, Laurent; Tubach, Jean-Pierre; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 10.8.1 - 10.8.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

REMORA, (REpresentation et Modelisation Objet pour la Reconnaissance Acoustico-phonetique: object representation and modelling for the acoustic phonetic recognition) is a software architecture for helping the phonetic decoding of continuous speech, using artificial intelligence techniques. Acoustic phonetic decoding is a central problem in continuous speech recognition. The basic idea of this project, realized at ENST, is to include various kinds of knowledge to improve accuracy and efficiency. The procedural knowledge may come from several sources such as centisecond segment recognition, diphone spotting or segmentation. The declarative knowledge may come from expertise on speech signal processing or from phonetic knowledge. In order to connect these two types of knowledge and to satisfy modularity and efficiency, we use an object-oriented formalism. The programming environment is a set of interctive menus designed to be easily employed by the experts. Author

Decoding; Phonetics; Speech Recognition; Artificial Intelligence; Software Engineering

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20060001631 Institute of Sound and Vibration Research, Southampton, UK

Stability of Adaptively Controlled Systems- A Graphical Approach

Darlington, P.; Elliott, S. J.; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 11.2.1 - 11.2.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

This paper considers the behaviour of dynamic systems under the control of the LMS algorithm, defining the limiting values of the plant's frequency response which yield a stable controller. The technique is extended to cover standard compensation strategies, including the 'filtered-x' algorithm. Author

Algorithms; Adaptive Control; Control Systems Design; Stability

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20060001633 Stanford Univ., Stanford, CA, USA

Continuous-Time Least-Squares Fast Transversal Filters

Lev-Ari, H.; Cioffi, J. M.; Kailath, T.; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 415-418; In English; See also 20060001583; Copyright; Avail.: Other Sources

A recursive-least-squares (RLS) adaptive fast transversal filter (FTF) for processing of continuous-time signals is presented. It has the same structure as the discrete-time least-squares FTF, namely, a tapped-delay-line with timevarying gains, which are updated by propagating a set of coupled recursions. However, while the discrete-time scheme involves a fundamental unit of time (i.e., the sampling period of the signal), which determines both the duration of the delay and the rate of gain updating, our continuous-time scheme involves a delay of arbitrary duration and continuously-varying gains. Also, the conceptual and computational complexity of the continuous-time FTF is reduced in comparison to the to that of the discrete-time FTF. The rate of parameter updating in the continuous-time configuration is essentially independent of the bandwidth and center frequency of the processed signal. Consequently, the gain-update module of the proposed algorithm can be implemented with slow devices (or with digital hardware), whereas the signal-path filter must match the frequency characteristics of the processed signal. Author

Least Squares Method; Algorithms; Adaptive Filters

20060001655 Institut de la Communication Parlee, Grenoble, France

Deterministic Characteristics of LPC Distances: An Inconsistency with Perceptual Evidence

Ye, Haiyan; Tuffelli, Denis; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 1.1.1 - 1.1.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

Deterministic characteristics of Linear Predictive Coding (LPC) distances are discussed in this paper. The study is carried out especially for French vowels which have clearly formant structure. Two studies are realized here: the first one is a study of contributions of different parameters (formants in particular) with help of sensibility functions and speech like spectra; the second one is an analysis of distance matrices by a multidimensional scaling method. Our goal is to examine the consistency of LPC distance measures with the formants perception, which are the most significant phonetic correlates of vowels. The results show some unsuitable properties of classic distances and we propose to evaluate distances on a phonetic plane. Author

Speech Recognition; Vowels; Cepstral Analysis

20060001660 Indiana Univ., Bloomington, IN, USA

Speaker-Dependent Speech Recognition as the Basis for a Speech Training Aid

Kewley-Port, Diane; Watson, Charles S.; Maki, Daniel; Reed, Daniel; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 10.4.1 - 10.4.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

The Indiana Speech Training Aid project (ISTRA) is evaluating the use of speaker-dependent speech recognition to provide feedback for deaf speakers or normalhearing misarticulating children, to assist them in improving their speech. Ongoing clinical trials of the ISTRA system have demonstrated effective

improvement in speech production. The theoretical approach is first to form templates from a child's current best productions of a word and then to use the score generated by matching new utterances to these templates as feedback to indicate the goodness of articulation. This paper presents the results of several evaluations of the utility of the SRB metric as a substitute for human judgement of the goodness of articulation of a whole word. Also, the confusion matrices resulting from recognition of acoustically similar words are discussed in terms of possible modifications of the algorithms. Author

Algorithms; Education; Speech Recognition; Speech Defects

20060001661 Shandong Engineering Inst., Jinan, China

The Four Tones Recognition of Continuous Chinese Speech

Ma, Hengjie; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 3.1.1. - 3.1.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

The requirement of continuity in pitch contours of continuous Chinese speech makes the pitch variation forms deviate from their original patterns and result in much difficulty in The Four Tones recognition. Experiments indicate that the information of articulation ways of adjacent words should be considered when The Four Tones recognition is carried on. An approach of The Four Tones of continuous Chinese speech recognition based on above idea is proposed and the analysis on it is also given. Author

Speech Recognition; China

20060001664 Carnegie-Mellon Univ., Pittsburgh, PA, USA

Sentence Parsing with Weak Grammatical Constraints

Stern, Richard M.; Ward, Wayne H.; Hauptmann, Alexander G.; Leon, Juan; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 10.6.1-10.6.4; In English; See also 20060001583 Contract(s)/Grant(s): N0039-85-C-0163; IRI-85-12695; Copyright; Avail.: Other Sources

This paper compares the recognition accuracy obtained in forming sentence hypotheses using several parsers based on different types of weak statistical models of syntax and semantics. The inputs to the parsers were word hypotheses generated from simulated acoustic-phonetic labels. Grammatical constraints are expressed by trigram models of sequences of lexical or semantic labels, or by a finite-state network of the semantic labels. When the input to the parser is of high quality, the more restrictive trigram models were found to perform as well as or better than the finite-state language model. The more restrictive trigram and network models of language produce better recognition accuracy when all correct words are actually hypothesized, but strong constraints can degrade performance when many correct words are missing from the parser input. Author

Grammars; Speech Recognition; Mathematical Models; Semantics; Sentences

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20060001666 Philips G.m.b.H., Germany

Dynamic Programming Speech Recognition Using a Context Free Grammar

Ney, Hermann; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 3.2.1-3.2.4; In English; See also 20060001583 Contract(s)/Grant(s): 413-5839-ITM 8401; Copyright; Avail.: Other Sources

This paper deals with the use of contextfree grammars in automatic speech recognition. A dynamic programming algorithm for recognizing and parsing spoken word strings of a context-free grammar is presented. The algorithm can be viewed as a probabilistic extension of the CYK algorithm along with the incorporation of the nonlinear time alignment. Details of the implementation and experimental tests are described. Author

Dynamic Programming; Speech Recognition; Grammars

20060001701 Bell Communications Research, Inc., Murray Hill, NJ, USA

On the Automatic Segmentation of Speech Signals

Svendsent, Torbjorn; Soong, Frank K.; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 3.4.1 - 3.4.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

For large vocabulary and continuous speech recognition, the sub-word-unit-based approach is a viable alternative to the whole-word-unit-based approach. For preparing a large inventory of sub-word units, an automatic segmentation is preferable to manual segmentation as it substantially reduces the work associated with the generation of templates and gives more consistent results. In this paper we discuss some methods for automatically segmenting speech into phonetic units. Three different approaches are described, one based on template matching, one based on detecting the spectral changes that occur at the boundaries between phonetic units and one based on a constrained-clustering vector quantization approach. An evaluation of the performance of the automatic segmentation methods is given. Author

Segments; Speech Recognition; Words (Language); Automatic Control

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20060001709 Pennsylvania State Univ., University Park, PA, USA

Unified Approach for Low Level Image Analysis

Jeong, Dong-seok; Lapsa, Paul M.; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987; In English; See also 20060001583 Contract(s)/Grant(s): NSF ECS-84-04782; Copyright; Avail.: Other Sources

Low level image analysis has been found to be difficult if the images are complicated. A popular strategy has been to model the image parametrically. Two prominent classes of approaches to the problem of parametrically modeling images are those based on assuming a stochastic relationship among the pixels, and those based on assuming a deterministic relationship. These two approaches have tend to have complementary areas of applicability. We develop a method, based on a general decision criterion for dealing with a variety of modeling strategies, and refer to the method as a unified approach. As a

consequence, this approach leads to advantages in segmenting images. The algorithm's output has the form that is convenient as input for higher-level processing such as AI approaches to computer vision. Author

Image Analysis; Algorithms; Mathematical Models; Artificial Intelligence

20060001712 Universite de Technologie de Compiegne, France

Automatic Recognition of Isolated or Occluded Planar Objects by a Two Steps Processing

Song, Jianming; Gaillard, Paul; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 7.6.1-7.6.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

As an application of robot vision to automatic recognition of industrial parts, we present a method which is capable of recognizing isolated or partially occluded two-dimensional objects. Starting from contour following, global features are measured and compared to stored data in order to make a preselection of the models. In the case of isolated object, the preselection leads to an immediate identification of objects. Otherwise, overlapping boundaries are detected and used to accomplish the recognition of occluded objects. By the combination of overlapping boundaries and the object's contour, a sequential segmentation algorithm is applied to find the complete contour of no hidden objects. As soon as we have obtained the complete contour of an object, we can use once again the global features to perform identification processing. This method has the advantage of being simple,rapide and efficient. It works well even when the number of objects to be recognized is large. Author

Algorithms; Computer Vision; Contours; Robots; Segments

20060001740 Imperial Coll. of Science, Technology and Medicine, London, UK

Speech Spectral Segmentation for Spectral Estimation and Formant Modeling

Chhatwal, Harprit S.; Constantinides, Anthony G.; IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '87); Volume 1; 1987, pp. 8.8.1-8.8.4; In English; See also 20060001583; Copyright; Avail.: Other Sources

The evaluation of accurate speech spectral estimates is of importance in many areas such as formant extraction, speaker/speech recognition etc. This work describes an approach based on Dynamic Programming for the optimal segmentation of speech spectra into Selective Linear Predictive (LP) segments to minimize the discrepancy between real and model spectra and thereby to produce effective spectral estimates of the original signal. A modification of this technique then leads to a novel method for the production of accurate estimates of speech formant positions. This segmentation scheme is implemented for both isolated speech spectra and complete utterances to produce values which are finally incorporated to cascade formant synthesisers. These results are found to offer significant advantages over those available using conventional LP methods. Author

Estimates; Segments; Spectra; Speech Recognition

20060001829 New York Univ., New York, NY USA

Matching Algorithms and Feature Match Quality Measures for Model-Based Object Recognition with Applications to Automatic Target Recognition

Keller, Martin G.; May 1, 1999; 149 pp.; In English Report No.(s): AD-A440328; No Copyright; Avail.: Defense Technical Information Center (DTIC)

In the fields of computational vision and image understanding, the object recognition problem can be formulated as a problem of matching a collection of model features to features extracted from an observed scene. This thesis is concerned with the use of feature-based match similarity measures and feature match algorithms in object detection and classification in the context of image understanding from complex signature data. Applications are in the domains of target vehicle recognition from radar imagery, and binocular stereopsis. The author considers image understanding to encompass the set of activities necessary to identify objects in visual imagery and to establish meaningful 3-D relationships between the objects themselves, or between the object and the viewer. The main goal in image understanding involves the transformation of images to symbolic representation, effectively providing a high-level description of an image in terms of objects, object attributes, and relationships between known objects. As such, image understanding subsumes the capabilities traditionally associated with image processing, object recognition, and artificial vision. In human and/or biological vision systems, the task of object recognition is a natural and spontaneous one. Humans can recognize immediately and without effort a huge variety of objects from diverse perceptual cues and multiple sensorial inputs. The operations involved are complex and inconspicuous psychophysical and biological processes, including the use of properties such as shape, color, texture, pattern, motion, context, as well as considerations based on contextual information, prior knowledge, expectations, functionality hypothesis, and temporal continuity. This research considers only the simpler problem of model-based vision, where the objects to be recognized come from a library of 3-D models known in advance, and the problem is constrained using context and domain-specific knowledge. DTIC

Algorithms; Computer Vision; Pattern Recognition; Signatures; Target Recognition; Targets

20060001834 Massachusetts Univ., Amherst, MA USA

Re-Using Schematic Grasping Policies

Platt, Robert; Grupen, Roderic A.; Fagg, Andrew H.; Jan. 1, 2005; 8 pp.; In English Contract(s)/Grant(s): DAAD19-03-R-0017 Report No.(s): AD-A440343; No Copyright; Avail.: CASI: A02, Hardcopy

It can be difficult to generalize the solutions to grasping and manipulation problems because even small differences in problem context can require qualitatively different solutions. For example, small changes in the shape of an object to be grasped can necessitate different grasp strategies. In this paper, the authors introduce the action schema framework that represents generalized skills in a functional way such that all viable ways of accomplishing a task are represented as instantiations of the generalized skill. They also propose an on-line algorithm for learning how to instantiate the skill in a context-appropriate way. They test this approach with a robotic grocery bagging task in which a dexterous humanoid robot learns to make correct qualitative decisions regarding how to grasp everyday grocery items and drop them in a paper bag.

DTIC

Artificial Intelligence; Control; Learning; Man Machine Systems; Policies; Robots

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20060001870 Massachusetts Univ., Amherst, MA USA

Hierarchical Multiagent Reinforcement Learning

Ghavamzadeh, Mohammad; Mahadevan, Sridhar; Jan. 25, 2004; 43 pp.; In English; Original contains color illustrations Contract(s)/Grant(s): DAANO2-98-C-4025 Report No.(s): AD-A440418; CMPSCI-TR-04-02; No Copyright; Avail.: Defense Technical Information Center (DTIC)

In this paper, we investigate the use of hierarchical reinforcement learning (HRL) to speed up the acquisition of cooperative multiagent tasks. We introduce a hierarchical multiagent reinforcement learning (RL) framework and propose a hierarchical multiagent RL algorithm called Cooperative HRL. In our approach, agents are cooperative and homogeneous (use the same task decomposition). Learning is decentralized, with each agent learning three interrelated skills: how to perform subtasks, which order to do them in, and how to coordinate with other agents. We define cooperative subtasks to be those subtasks in which coordination among agents significantly improves the performance of the overall task. Those levels of the hierarchy which include cooperative subtasks are called cooperation levels. Since coordination at high levels allows for increased cooperation skills as agents do not get confused by low-level details, we usually define cooperative subtasks at the high levels of the hierarchy. DTIC

Hierarchies; Learning; Robots

20060002124 Illinois Univ., Urbana, IL, USA

Real Time Implementation of Obstacle Avoidance Manipulator Maneuvers with Bounded Inputs

Ning, Chen; Dwyer, T.A.W., III; 1987 IEEE International Symposium on Circuits and Systems, Volume 2; 1987, pp. 402-405; In English; See also 20060002103; Copyright; Avail.: Other Sources

The feasibility of real time, microprocessor based, robot command generation is investigated for obstacle-avoidance maneuvers with saturating actuators. One-step-ahead position and rate error minimization with N step ahead state constraints (predictor) is used, to select the required accelerations. The algorithm becomes a sequence of linearly constrained quadratic minimizations, re-set at each time step from sensor information and from adaptive covariance filters. Fully nonlinear dynamics can be accommodated. Experimental verification on a PC-AT controlled 3 DOF robot is discussed. Author

Covariance; Robots; Microprocessors; Adaptive Filters; Manipulators; Real Time Operation; Actuators

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20060002353 Royal Netherlands Meteorological Inst., Netherlands

Automated Support Structured Troubleshooting

Keijer, W.; Gillis, M. P. W.; Loo, S. V. D.; July 2005; 39 pp.; In English; Original contains color illustrations Report No.(s): TNO-DV1 2004 A263; TD2004-0457; Copyright; Avail.: Other Sources

Due to the increasing complexity and integration of modern ship systems, diagnosis of system failures becomes increasingly difficult. To this end, tools must be developed to assist the maintainers of the systems in diagnosis and repair tasks. A demonstrator version of an interactive software tool has been developed, based on the training method Structured Faultfinding (Gestructureerd Storingzoeken or GSZ).With this demonstrator, the potential of such an interactive tool has been evaluated. The suitability of GSZ as the basis for the application has been proved and requirements have been drawn up for the functionality of future diagnosis tools. Author

Ships; Maintenance; Decision Support Systems

20060002496 Royal Netherlands Meteorological Inst., Netherlands

Information Linking and SA: Reconnaissance Situation Awareness

Rypkema, J. A.; Weitenberg, A. L. M.; Krabbendam, A. J.; van der Stap, C. L. M.; September 2005; 30 pp.; In English; Original contains color illustrations Report No.(s): TNO-DV3 2005 B093; Copyright; Avail.: Other Sources

This report focuses on the changing tasks within the Netherlands military which have changed from traditional defense of national and allied territories during a global conflict with a well-known enemy towards peace keeping and crisis management operations. This change is accompanied with new demands concerning the information needs regarding situation awareness (SA). A literature study has been done to define situation awareness. Next, it was explored what information is needed to realise an optimal SA. Therefore, a distinction was made between content and presentation. Content is related to the kind of information, while the presentation concentrates on how this information presented to the end user. Special attention has been paid to human information processing, because this plays an important role on how information should be presented. For SA it is important that the right signals are perceived (perception), that they are interpreted in the right way. (comprehension) and that the situation in the future can be estimated (projection). The information that is needed to do so depends on the specific circumstances. Factors, that play an important role, are the domain, the mission, the level of command, the environment, the situation, the point of time and the duties. In order to get an overview about the information needed, these factors should be analysed for every specific assignment. Besides that, the quality of the soldiers SA and performance depends on the cognitive task load. A cognitive task load model is shown, with which the soldiers cognitive can be described. When cognitive load is too high, people may use decision strategies, leading to sub-optimal task performance. Adequate interface design helps to prevent this.Aman-machine interaction model is presented to support the design process.Agood SA is realised by presented the right information in the right way. This report offers a framework for defining what this information is. The knowledge about human information processing and man-machine interaction give support during the man-machine interface design process. Derived from text

Information; Management Methods; Reconnaissance

20060002506 La Coruna Univ., La Coruna, Spain

Validation and Usability Analysis of Intelligent Systems: An Integrated Approach

Mosqueira-Rey, Eduardo; Moret-Bonillo, Vicente; The IPSI BgD Transactions on Advanced Research. Multi-, Inter-, and Trans-disciplinary Issues in Computer Science and Engineering, Volume 1, Number 2; July 2005, pp. 37-45; In English; See also 20060002498; Original contains black and white illustrations Contract(s)/Grant(s): CICYT Proj. TIC2001-0569; Copyright; Avail.: CASI: A02, Hardcopy

Validation of intelligent systems is a complex matter due to the lack of standard references for complex domains. Moreover, the validation phase should be followed by a usability analysis for studying the quality of man-machine interaction. The VISNU (Validation of Intelligent Systems aNd Usability) tool has been designed to assist developers in the validation and usability analysis phases in intelligent system design. The validation module includes quantitative measures (such as pair tests, group tests and agreement ratios) and facilities for planning the entire process and for interpreting the final results. The usability module includes different types of usability analyses, namely, heuristic (based on the collaboration of experts), subjective (based on the collaboration of users) and empirical (based on objective data). One of the main goals of the system developers has been to integrate different evaluation methods to obtain information which could not otherwise be obtained. Author

Artificial Intelligence; Program Verification (Computers); Systems Integration; Systems Engineering

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20060002507 La Coruna Univ., La Coruna, Spain

Telemedicine Intelligent Learning. Ontology for Agent Technology

Ferrer-Roca, A. O.; Figueredo, K.; Franco, A.; Cardenas, B.; The IPSI BgD Transactions on Advanced Research. Multi-, Inter-, and Trans-disciplinary Issues in Computer Science and Engineering, Volume 1, Number 2; July 2005, pp. 46-54; In English; See also 20060002498; Original contains black and white illustrations; Copyright; Avail.: CASI: A02, Hardcopy

Telemedicine (TM) is an ever-evolving multidisciplinary subject where knowledge is acquired by continuous training rather than as part of a curriculum. The current challenge is to create an intelligent tool that delivers personalized training to professionals with different backgrounds, making use of scientific innovations from any source, even the Internet. We present an innovative metadata packaging and rule-building tool to achieve an adaptive retrieval system that may draw on all available resources. For this purpose we used vocabulary and ontologies founded on the telemedicine body of knowledge (TM-BOK) hierarchy and Medical Sub-headings (MeSH). The packaging tool creates a modified XML- manifest that contains a Navigable Knowledge Map and a separate Rule-extension executed by Agents during the process of navigation. Agent systems also handle personalization. selecting packages by reading metadata tags. The result is an adaptive and adaptable TM knowledge delivery tool used by the students to reduce the time on searching information. Author

Artificial Intelligence; Telemedicine; Machine Learning

20060002508 Wien Univ., Austria

Online Fundraising for Nonprofit Organizations

Pollach, Irene; Treiblmaier, Horst; Floh, Arne; The IPSI BgD Transactions on Advanced Research. Multi-, Inter-, and Trans-disciplinary Issues in Computer Science and Engineering, Volume 1, Number 2; July 2005, pp. 55-61; In English; See also 20060002498; Copyright; Avail.: CASI: A02, Hardcopy

Although the Internet provides nonprofit organizations with unprecedented opportunities for fundraising, the volume of online donations has been miniscule. Since one reason for this may be people's distrust in financial transactions on the WWW, we conducted a survey to gain insights into user trust in and attitudes toward online payment systems. The results indicate that people's trust in both the organization and the Internet are key factors in shaping their attitudes toward online payments, which in turn influences people's likelihood of using the Internet for financial transactions such as donations. Our findings suggest that nonprofits need to pay particular attention to donor relationships, process transparency, and transaction security in order to induce people to donate online. Author

Internets; On-Line Systems; Organizations

Source: NASA.

AEROSPACE & DEFENSE ENGINEERING STANDARDS NEWS

October 20, 2009
Ares I-X Rocket Arrives at Kennedy Space Center Launch Pad 39B
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