

Joao P Hespanha Linear Systems Theory Solutions

Linear Systems Theory Hybrid Systems: Computation and Control Model-Based Reinforcement Learning Advances in Soft Computing - AFSS 2002 Modern Speech Recognition Pattern Recognition Computer Vision -- ECCV 2006 Bio-Inspired Computing and Applications Neural information processing Hybrid Systems: Computation and Control Advances in Machine Learning Handbook of Face Recognition Unsolved Problems in Mathematical Systems and Control Theory Introduction to Averaging Dynamics over Networks Advances in H_∞ Control Theory Digital Forensic Science Advances in Biometrics Computer Vision -- ACCV 2009 Advances in Biometrics Image Analysis and Recognition Computer Vision - ECCV 2014 Workshops Analysis and Modeling of Faces and Gestures H-Systems State of the art in Biometrics Hybrid Systems: Computation and Control Control Subject to Computational and Communication Constraints Advanced Autonomous Vehicle Design for Severe Environments Computer Vision -- ECCV 2010 Control Systems, Robotics and Automation N - Volume XV Articulated Motion and Deformable Objects Optimization Models Observer-Based Fault Diagnosis and Fault-Tolerant Control for Switched Systems Adaptive Dynamic Programming: Solltrajektorienfolge-regelung und Konvergenzbedingungen Advanced Intelligent Computing Theories and Applications Semantic Mining Technologies for Multimedia Databases Recent Results on Nonlinear Delay Control Systems Graph Embedding for Pattern Analysis Stability Theory of Switched Dynamical Systems Elements of Dimensionality Reduction and Manifold Learning Artificial Intelligence in Real-time Control (AIRC-2000) João P. Hespanha Claire J. Tomlin Milad Farsi Nikhil R. Pal S. Ramakrishnan Cheng-Lin Liu De-Shuang Huang Irwin King Frits W. Vaandrager Zhi-Hua Zhou Stan Z. Li Vincent D. Blondel Fabio Fagnani Eli Gershon B Suresh Shetty David Zhang Hongbin Zha Massimo Tistarelli Aurélio Campilho Lourdes Agapito S. Kevin Zhou Elena De Santis Jucheng Yang Magnus Egerstedt Sophie Tarbouriech V.V. Vantsevich Kostas Daniilidis Heinz D. Unbehauen Francisco J. Perales Giuseppe C. Calafiore Dongsheng Du Köpf, Florian De-Shuang Huang Tao, Dacheng Iasson Karafyllis Yun Fu Zhendong Sun Benyamin Ghogh I. J. Rudas

Linear Systems Theory Hybrid Systems: Computation and Control Model-Based Reinforcement Learning Advances in Soft Computing - AFSS 2002 Modern Speech Recognition Pattern Recognition Computer Vision -- ECCV 2006 Bio-Inspired

Computing and Applications Neural information processing Hybrid Systems: Computation and Control Advances in Machine Learning Handbook of Face Recognition Unsolved Problems in Mathematical Systems and Control Theory Introduction to Averaging Dynamics over Networks Advances in H_∞ Control Theory Digital Forensic Science Advances in Biometrics Computer Vision -- ACCV 2009 Advances in Biometrics Image Analysis and Recognition Computer Vision - ECCV 2014 Workshops Analysis and Modeling of Faces and Gestures H-Systems State of the art in Biometrics Hybrid Systems: Computation and Control Control Subject to Computational and Communication Constraints Advanced Autonomous Vehicle Design for Severe Environments Computer Vision -- ECCV 2010 Control Systems, Robotics and Automation - Volume XV Articulated Motion and Deformable Objects Optimization Models Observer-Based Fault Diagnosis and Fault-Tolerant Control for Switched Systems Adaptive Dynamic Programming: Solltrajektorienfolgeregulierung und Konvergenzbedingungen Advanced Intelligent Computing Theories and Applications Semantic Mining Technologies for Multimedia Databases Recent Results on Nonlinear Delay Control Systems Graph Embedding for Pattern Analysis Stability Theory of Switched Dynamical Systems Elements of Dimensionality Reduction and Manifold Learning Artificial Intelligence in Real-time Control (AIRC-2000) João P. Hespanha Claire J. Tomlin Milad Farsi Nikhil R. Pal S. Ramakrishnan Cheng-Lin Liu De-Shuang Huang Irwin King Frits W. Vaandrager Zhi-Hua Zhou Stan Z. Li Vincent D. Blondel Fabio Fagnani Eli Gershon B Suresh Shetty David Zhang Hongbin Zha Massimo Tistarelli Aurélio Campilho Lourdes Agapito S. Kevin Zhou Elena De Santis Jucheng Yang Magnus Egerstedt Sophie Tarbouriech V.V. Vantsevich Kostas Daniilidis Heinz D. Unbehauen Francisco J. Perales Giuseppe C. Calafiore Dongsheng Du Köpf, Florian De-Shuang Huang Tao, Dacheng Iasson Karafyllis Yun Fu Zhendong Sun Benyamin Ghogh I. J. Rudas

a fully updated textbook on linear systems theory linear systems theory is the cornerstone of control theory and a well established discipline that focuses on linear differential equations from the perspective of control and estimation this updated second edition of linear systems theory covers the subject s key topics in a unique lecture style format making the book easy to use for instructors and students joão hespanha looks at system representation stability controllability and state feedback observability and state estimation and realization theory he provides the background for advanced modern control design techniques and feedback linearization and examines advanced foundational topics such as multivariable poles and zeros and lqg lqr the textbook presents only the most essential mathematical derivations and places comments discussion and terminology in sidebars so that readers can follow the core material easily and without distraction annotated proofs with

sidebars explain the techniques of proof construction including contradiction contraposition cycles of implications to prove equivalence and the difference between necessity and sufficiency annotated theoretical developments also use sidebars to discuss relevant commands available in matlab allowing students to understand these tools this second edition contains a large number of new practice exercises with solutions based on typical problems these exercises guide students to succinct and precise answers helping to clarify issues and consolidate knowledge the book s balanced chapters can each be covered in approximately two hours of lecture time simplifying course planning and student review easy to use textbook in unique lecture style format sidebars explain topics in further detail annotated proofs and discussions of matlab commands balanced chapters can each be taught in two hours of course lecture new practice exercises with solutions included

this book constitutes the refereed proceedings of the 5th international workshop on hybrid systems computation and control hsc 2002 held in stanford california usa in march 2002 the 33 revised full papers presented were carefully reviewed and selected from 73 submissions all current issues in hybrid systems are addressed including formal models and methods and computational representations algorithms and heuristics computational tools and innovative applications

model based reinforcement learning explore a comprehensive and practical approach to reinforcement learning reinforcement learning is an essential paradigm of machine learning wherein an intelligent agent performs actions that ensure optimal behavior from devices while this paradigm of machine learning has gained tremendous success and popularity in recent years previous scholarship has focused either on theory optimal control and dynamic programming or on algorithms most of which are simulation based model based reinforcement learning provides a model based framework to bridge these two aspects thereby creating a holistic treatment of the topic of model based online learning control in doing so the authors seek to develop a model based framework for data driven control that bridges the topics of systems identification from data model based reinforcement learning and optimal control as well as the applications of each this new technique for assessing classical results will allow for a more efficient reinforcement learning system at its heart this book is focused on providing an end to end framework from design to application of a more tractable model based reinforcement learning technique model based reinforcement learning readers will also find a useful textbook to use in graduate courses on data driven and learning based control that emphasizes modeling and control of dynamical systems from data detailed comparisons of the impact of different techniques such as basic linear quadratic controller learning based model predictive control model free reinforcement learning and structured online learning applications and case studies on ground vehicles

with nonholonomic dynamics and another on quadrator helicopters an online python based toolbox that accompanies the contents covered in the book as well as the necessary code and data model based reinforcement learning is a useful reference for senior undergraduate students graduate students research assistants professors process control engineers and roboticists

it is our great pleasure to welcome you all to the 2002 afss international conference on fuzzy systems afss 2002 to be held in calcutta the great city of joy afss 2002 is the fth conference in the series initiated by the asian fuzzy systems society afss afss 2002 is jointly being organized by theindianstatisticalinstitute isi andjadavpuruniversity ju likeprevious conferencesinthisseries wearesure afss2002willprovideaforumforfruitful interaction and exchange of ideas between the participants from all over the globe the present conference covers all major facets of soft computing such as fuzzy logic neural networks genetic algorithms including both theories and applications wehopethismeetingwillbeenjoyableacademicallyandotherwise we are thankful to the members of the international program committee and the area chairs for extending their support in various forms to make a strong technical program each submitted paper was reviewed by at least three referees and in some cases the revised versions were again checked by the referees as a result of this tough screening process we could select only about 50 of the submitted papers we again express our sincere thanks to all referees for doing a great job we are happy to note that 19 different countries from all over the globe are represented by the authors thereby making it a truly international conference we are proud to have a list of distinguished speakers including profs z pawlak j bezdek d dubois and t yamakawa

this book focuses primarily on speech recognition and the related tasks such as speech enhancement and modeling this book comprises 3 sections and thirteen chapters written by eminent researchers from usa brazil australia saudi arabia japan ireland taiwan mexico slovakia and india section 1 on speech recognition consists of seven chapters sections 2 and 3 on speech enhancement and speech modeling have three chapters each respectively to supplement section 1 we sincerely believe that thorough reading of these thirteen chapters will provide comprehensive knowledge on modern speech recognition approaches to the readers

this book constitutes the refereed proceedings of the chinese conference on pattern recognition ccpr 2012 held in beijing china in september 2012 the 82 revised full papers presented were carefully reviewed and selected from 137 submissions

the papers are organized in topical sections on pattern recognition theory computer vision biometric recognition medical imaging image and video analysis document analysis speech processing natural language processing and information retrieval

the three volume set lncs 6838 lnai 6839 and lnbi 6840 constitutes the thoroughly refereed post conference proceedings of the 7th international conference on intelligent computing icic 2011 held in zhengzhou china in august 2011 this volume contains 93 revised full papers from a total of 281 presentations at the conference carefully reviewed and selected from 832 initial submissions the papers address all issues in advanced intelligent computing especially methodologies and applications including theories methodologies and applications in science and technology they include a range of techniques such as artificial intelligence pattern recognition evolutionary computing informatics theories and applications computational neuroscience and bioscience soft computing human computer interface issues etc

the three volume set lncs 4232 lncs 4233 and lncs 4234 constitutes the refereed proceedings of the 13th international conference on neural information processing iconip 2006 held in hong kong china in october 2006 the 386 revised full papers presented were carefully reviewed and selected from 1175 submissions

this volume contains the proceedings of the second international workshop on hybrid systems computation and control hsc 99 to be held march 29 31 1999 in the village berg en dal near nijmegen the netherlands the rst workshop of this series was held in april 1998 at the university of california at berkeley the series follows meetings that were initiated by anil nerode at cornell university the proceedings of those meetings were published in the springer verlag lncs series volumes 736 999 1066 1201 and 1273 the proceedings of the rst workshop of the new series was published in lncs 1386 the focus of the workshop is on modeling control synthesis design and verification of hybrid systems a hybrid system is a theoretical model for a computer controlled engineering system with a dynamics that evolves both in a discrete state set and in a family of continuous state spaces research is motivated by for example control of electro mechanical systems robots air traffic control control of automated freeways and chemical process control the emerging search area of hybrid systems overlaps both with computer science and with control theory the interaction between researchers from these fields is expected to be fruitful for the development of the area of hybrid systems

the first asian conference on machine learning acml 2009 was held at nanjing china during november 2 4 2009 this was the first edition of a series of annual conferences which aim to provide a leading international forum for researchers in machine learning and related fields to share their new ideas and research findings this year we received 113 submissions from 18 countries and regions in asia australasia europe and north america the submissions went through a rigorous double blind reviewing process most submissions received four reviews a few submissions received five reviews while only several submissions received three reviews each submission was handled by an area chair who coordinated discussions among reviewers and made recommendation on the submission the program committee chairs examined the reviews and meta reviews to further guarantee the reliability and integrity of the reviewing process twenty nine papers were selected after this process to ensure that important revisions required by reviewers were incorporated into the final accepted papers and to allow submissions which would have potential after a careful revision this year we launched a revision double check process in short the above mentioned 29 papers were conditionally accepted and the authors were requested to incorporate the important and must revision summarized by area chairs based on reviewers comments their revised final version and the revision list of each conditionally accepted paper was examined by the area chair and program committee chairs papers that failed to pass the examination were finally rejected

this highly anticipated new edition provides a comprehensive account of face recognition research and technology spanning the full range of topics needed for designing operational face recognition systems after a thorough introductory chapter each of the following chapters focus on a specific topic reviewing background information up to date techniques and recent results as well as offering challenges and future directions features fully updated revised and expanded covering the entire spectrum of concepts methods and algorithms for automated face detection and recognition systems provides comprehensive coverage of face detection tracking alignment feature extraction and recognition technologies and issues in evaluation systems security and applications contains numerous step by step algorithms describes a broad range of applications presents contributions from an international selection of experts integrates numerous supporting graphs tables charts and performance data

this book provides clear presentations of more than sixty important unsolved problems in mathematical systems and control theory each of the problems included here is proposed by a leading expert and set forth in an accessible manner covering a wide range of areas the book will be an ideal reference for anyone interested in the latest developments in the field including

specialists in applied mathematics engineering and computer science the book consists of ten parts representing various problem areas and each chapter sets forth a different problem presented by a researcher in the particular area and in the same way description of the problem motivation and history available results and bibliography it aims not only to encourage work on the included problems but also to suggest new ones and generate fresh research the reader will be able to submit solutions for possible inclusion on an online version of the book to be updated quarterly on the princeton university press website and thus also be able to access solutions updated information and partial solutions as they are developed

this book deals with averaging dynamics a paradigmatic example of network based dynamics in multi agent systems the book presents all the fundamental results on linear averaging dynamics proposing a unified and updated viewpoint of many models and convergence results scattered in the literature starting from the classical evolution of the powers of a fixed stochastic matrix the text then considers more general evolutions of products of a sequence of stochastic matrices either deterministic or randomized the theory needed for a full understanding of the models is constructed without assuming any knowledge of markov chains or perron frobenius theory jointly with their analysis of the convergence of averaging dynamics the authors derive the properties of stochastic matrices these properties are related to the topological structure of the associated graph which in the book's perspective represents the communication between agents special attention is paid to how these properties scale as the network grows in size finally the understanding of stochastic matrices is applied to the study of other problems in multi agent coordination averaging with stubborn agents and estimation from relative measurements the dynamics described in the book find application in the study of opinion dynamics in social networks of information fusion in sensor networks and of the collective motion of animal groups and teams of unmanned vehicles introduction to averaging dynamics over networks will be of material interest to researchers in systems and control studying coordinated or distributed control networked systems or multiagent systems and to graduate students pursuing courses in these areas

advances in h control theory is concerned with state of the art developments in three areas the extended treatment of mostly deterministic switched systems with dwell time the control of retarded stochastic state multiplicative noisy systems and a new approach to the control of biochemical systems exemplified by the threonine synthesis and glycolytic pathways following an introduction and extensive literature survey each of these major topics is the subject of an individual part of the book the first two parts of the book contain several practical examples taken from various fields of control engineering including

aircraft control robot manipulation and process control these examples are taken from the fields of deterministic switched systems and state multiplicative noisy systems the text is rounded out with short appendices covering mathematical fundamentals σ algebra and the input output method for retarded systems advances in h control theory is written for engineers engaged in control systems research and development for applied mathematicians interested in systems and control and for graduate students specializing in stochastic control

it is our pleasure to place before you the book digital forensic science this book makes up a major part of the broad specialty of digital forensic science comprising mainly of tools and technologies of cyber forensic experts for their future practice this book has been designed to merge a range of new ideas and unique works of authors from topics like fundamental principles of forensic cyber analysis and protocols and rules needed for the best digital forensics we hope that it will be useful to practitioners of forensic medicine experts cyber experts law makers investigating authorities and undergraduate and postgraduate medical school graduates of medicine

this book constitutes the refereed proceedings of the international conference on biometrics icb 2006 held in hong kong china in january 2006 the book includes 104 revised full papers covering such areas of biometrics as the face fingerprint iris speech and signature biometric fusion and performance evaluation gait keystrokes and more in addition the results of the face authentication competition fac 2006 are also announced in this volume

the three volume set lncs 5994 lncs 5995 and lncs 5996 constitutes the thoroughly refereed post conference proceedings of the 9th asian conference on computer vision accv 2009 held in xi an china in september 2009 the 35 revised full papers and 130 revised poster papers of the three volumes were carefully reviewed and selected from 670 submissions the papers are organized in topical sections on multiple view and stereo face and pose analysis motion analysis and tracking segmentation feature extraction and object detection image enhancement and visual attention machine learning algorithms for vision object categorization and face recognition biometrics and surveillance stereo motion analysis and tracking segmentation detection color and texture as well as machine learning recognition biometrics and surveillance

rd it is a pleasure and an honour both to organize icb 2009 the 3 iapr ieee international conference on biometrics this will be held 2 5 june in alghero italy hosted by the computer vision laboratory university of sassari the conference series is the

premier forum for presenting research in biometrics and its allied technologies the generation of new ideas new approaches new techniques and new evaluations the icb series originated in 2006 from joining two highly reputed conferences audio and video based personal authentication avbpa and the international conference on biometric authentication icba previous conferences were held in hong kong and in korea this is the first time the icb conference has been held in europe and by programme committee arrangements and by the quality of the papers icb 2009 will continue to maintain the high standards set by its predecessors in total we received around 250 papers for review of these 36 were selected for oral presentation and 93 for poster presentation these papers are accompanied by the invited speakers heinrich h bülhoff max planck institute for biological cybernetics tüb gen germany on what can machine vision learn from human perception daoki furui department of computer science tokyo institute of technology on 40 years of progress in automatic speaker recognition technology and jean christophe fondeur sagem security and morpho usa on large scale deployment of biometrics and border control

iciar 2004 the international conference on image analysis and recognition was the first iciar conference and was held in porto portugal iciar will be organized annually and will alternate between europe and north america iciar 2005 will take place in toronto ontario canada the idea of offering these conferences came as a result of discussion between researchers in portugal and canada to encourage collaboration and exchange mainly between these two countries but also with the open participation of other countries addressing recent advances in theory methodology and applications the response to the call for papers for iciar 2004 was very positive from 316 full papers submitted 210 were accepted 97 oral presentations and 113 posters the review process was carried out by the program committee members and other reviewers all are experts in various image analysis and recognition areas each paper was reviewed by at least two reviewing parties the high quality of the papers in these proceedings is attributed first to the authors and second to the quality of the reviews provided by the experts we would like to thank the authors for responding to our call and we wholeheartedly thank the reviewers for their excellent work in such a short amount of time we are especially indebted to the program committee for their efforts that allowed us to set up this publication we were very pleased to be able to include in the conference prof murat kunt from the swiss federal institute of technology and prof mario figueiredo of the instituto superior tecnico in portugal

the four volume set lncs 8925 8926 8927 and 8928 comprises the refereed post proceedings of the workshops that took place in conjunction with the 13th european conference on computer vision eccv 2014 held in zurich switzerland in september 2014 the 203 workshop papers were carefully reviewed and selected for inclusion in the proceedings they were presented at

workshops with the following themes where computer vision meets art computer vision in vehicle technology spontaneous facial behavior analysis consumer depth cameras for computer vision chlearn looking at people pose recovery action interaction gesture recognition video event categorization tagging and retrieval towards big data computer vision with local binary pattern variants visual object tracking challenge computer vision ontology applies cross disciplinary technologies visual perception of affordance and functional visual primitives for scene analysis graphical models in computer vision light fields for computer vision computer vision for road scene understanding and autonomous driving soft biometrics transferring and adapting source knowledge in computer vision surveillance and re identification color and photometry in computer vision assistive computer vision and robotics computer vision problems in plant phenotyping and non rigid shape analysis and deformable image alignment additionally a panel discussion on video segmentation is included

this book constitutes the refereed proceedings of the third international workshop on analysis and modelling of faces and gestures amfg 2007 held within the scope of iccv 2007 the international conference on computer vision the papers review the status of recognition analysis and modeling of face gesture activity and behavior topics addressed include feature representation 3d face video based face recognition facial motion analysis and sign recognition

this book focuses on the observability of hybrid systems it enables the reader to determine whether and how a hybrid system's state can be reconstructed from sometimes necessarily partial information by explaining how available measurements can be used to deduce past and future behaviours of a system the authors extend this study of observability to embrace the properties of diagnosability and predictability h systems shows how continuous and discrete dynamics and their interaction affect the observability of this general class of hybrid systems and demonstrates that hybrid characteristics are not simply generalizations of well known aspects of traditional dynamics the authors identify conditions for state reconstruction prediction and diagnosis of the occurrence of possibly faulty states the formal approach to proving those properties for hybrid systems is accompanied by simple illustrative examples for readers who are interested in the use of state estimation for controller design the book also provides design methods for hybrid state observers and covers their application in some industrial cases the book's tutorial approach to the various forms of observability of hybrid systems helps to make h systems of interest to academic researchers and graduate students working in control and to practitioners using control in an industrial environment

biometric recognition is one of the most widely studied problems in computer science the use of biometrics techniques such as face fingerprints iris and ears is a solution for obtaining a secure personal identification however the old biometrics identification techniques are out of date this goal of this book is to provide the reader with the most up to date research performed in biometric recognition and descript some novel methods of biometrics emphasis on the state of the art skills the book consists of 15 chapters each focusing on a most up to date issue the chapters are divided into five sections fingerprint recognition face recognition iris recognition other biometrics and biometrics security the book was reviewed by editors dr jucheng yang and dr loris nanni we deeply appreciate the efforts of our guest editors dr girija chetty dr norman poh dr jianjiang feng dr dongsun park and dr sook yoon as well as a number of anonymous reviewers

this book constitutes the refereed proceedings of the 11th international conference on hybrid systems computation and control hsc 2008 held in st louis mo usa in april 2008 the 42 revised full papers and 20 revised short papers presented were carefully reviewed and selected from numerous submissions for inclusion in the book the papers focus on research in embedded reactive systems involving the interplay between symbolic switching and continuous dynamical behaviors and feature the latest developments of applications and theoretical advancements in the design analysis control optimization and implementation of hybrid systems with particular attention to embedded and networked control systems

this book provides a broad overview of the current problems challenges and solutions in the field of control theory communication theory and computational resources management recent results on dynamical systems which open new opportunities for research and challenges to be addressed in the future are proposed in the context of computational and communication constraints in order to take into the account complex phenomena such as nonlinearities time varying parameters and limited availability of information the book proposes new approaches for open problems with both theoretical and practical significance the contributors research is centred on robust stability and performance of control loops that are subject to computational and communication constraints a particular focus is placed on the presence of constraints in communication and computation which is a critical issue in networked control systems and cyber physical systems the contributions which rely on the development of novel paradigms are provided are by leading experts in the field from all over the world thus providing readers with the most accurate solutions for the constraints control subject to computational and communication constraints highlights many problems encountered by control researchers while also informing graduate students of the many interesting ideas at the frontier between control theory information theory and

computational theory the book is also a useful point of reference for engineers and practitioners and the survey chapters will assist instructors in lecture preparation

classical vehicle dynamics which is the basis for manned ground vehicle design has exhausted its potential for providing novel design concepts to a large degree at the same time unmanned ground vehicle ugv dynamics is still in its infancy and is currently being developed using general analytical dynamics principles with very little input from actual vehicle dynamics theory this technical book presents outcomes from the nato advanced study institute asi advanced autonomous vehicle design for severe environments held in coventry uk in july 2014 the asi provided a platform for world class professionals to meet and discuss leading edge research engineering accomplishments and future trends in manned and unmanned ground vehicle dynamics terrain mobility and energy efficiency the outcomes of this collective effort serve as an analytical foundation for autonomous vehicle design topics covered include historical aspects pivotal accomplishments and the analysis of future trends in on and off road manned and unmanned vehicle dynamics terramechanics soil dynamic characteristics uncertainties and stochastic characteristics of vehicle environment interaction for agile vehicle dynamics modeling new methods and techniques in on line control and learning for vehicle autonomy fundamentals of agility and severe environments mechatronics and cyber physics issues of agile vehicle dynamics to design for control energy harvesting and cyber security and case studies of agile and inverse vehicle dynamics and vehicle systems design including optimisation of suspension and driveline systems the book targets graduate students who desire to advance further in leading edge vehicle dynamics topics in manned and unmanned ground vehicles phd students continuing their research work and building advanced curricula in academia and industry and researchers in government agencies and private companies

the six volume set comprising lncs volumes 6311 until 6313 constitutes the refereed proceedings of the 11th european conference on computer vision eccv 2010 held in heraklion crete greece in september 2010 the 325 revised papers presented were carefully reviewed and selected from 1174 submissions the papers are organized in topical sections on object and scene recognition segmentation and grouping face gesture biometrics motion and tracking statistical models and visual learning matching registration alignment computational imaging multi view geometry image features video and event characterization shape representation and recognition stereo reflectance illumination color medical image analysis

this encyclopedia of control systems robotics and automation is a component of the global encyclopedia of life support

systems eolss which is an integrated compendium of twenty one encyclopedias this 22 volume set contains 240 chapters each of size 5000 30000 words with perspectives applications and extensive illustrations it is the only publication of its kind carrying state of the art knowledge in the fields of control systems robotics and automation and is aimed by virtue of the several applications at the following five major target audiences university and college students educators professional practitioners research personnel and policy analysts managers and decision makers and ngos

this book constitutes the refereed proceedings of the 5th international conference on articulated motion and deformable objects amdo 2008 held in port d andratx mallorca spain in july 2008 the 36 revised full papers and 7 poster papers presented were carefully reviewed and selected from 64 submissions the papers are organized in topical section on computer graphics human modelling and animation human motion analysis tracking 3d reconstruction and recognition multimodal user interaction vr and ar speech biometrics and advanced multimedia systems standards indexed video contents

this accessible textbook demonstrates how to recognize simplify model and solve optimization problems and apply these principles to new projects

this book focuses on the fault diagnosis observer design for the switched system model based fault diagnosis and fault tolerant control are one of the most popular research directions in recent decades it contains eight chapters every chapter is independent in the method of observer design but all chapters are around the same topic besides in each chapter the model description and theoretical results are firstly provided then some practical application examples are illustrated to prove the obtained results the advanced theoretical methodologies will benefit researchers or engineers in the area of safety engineering and the arrangement of the structure will help the readers to understand the content easily

in diesem werk werden erstmals zeitdiskrete und zeitkontinuierliche methoden präsentiert und analysiert um flexible solltrajektorien darstellungen in adaptive dynamic programming ansätze zu integrieren zudem werden theoretische bedingungen an den systemzustand hergeleitet die eine zentrale anregungseigenschaft für die konvergenz der adaption sicherstellen reale anwendungen der vorgestellten adaptiven optimalen trajektorienfolgeregelungsmethoden offenbaren das potenzial dieser ansätze in this work discrete time and continuous time methods that integrate flexible reference trajectory representations into adaptive dynamic programming approaches are presented and analyzed for the first time moreover

theoretical conditions on the system state are derived that ensure the persistent excitation property which is crucial for the convergence of the adaptation real world applications of the presented adaptive optimal trajectory tracking control methods reveal their potential

this book constitutes the refereed proceedings of the 6th international conference on intelligent computing icic 2010 held in changsha china in august 2010 the 85 revised full papers presented were carefully reviewed and selected from a numerous submissions the papers are organized in topical sections on neural networks evolutionary learning genetic algorithms fuzzy theory and models fuzzy systems and soft computing particle swarm optimization and niche technology supervised semi supervised learning unsupervised reinforcement learning combinatorial numerical optimization systems biology and computational biology neural computing and optimization nature inspired computing and optimization knowledge discovery and data mining artificial life and artificial immune systems intelligent computing in image processing special session on new hand based biometric methods special session on recent advances in image segmentation special session on theories and applications in advanced intelligent computing special session on search based software engineering special session on bio inspired computing and applications special session on advance in dimensionality reduction methods and its applications special session on protein and gene bioinformatics methods and applications

provides an introduction to recent techniques in multimedia semantic mining necessary to researchers new to the field

this volume collects recent advances in nonlinear delay systems with an emphasis on constructive generalized lyapunov and predictive approaches that certify stability properties the book is written by experts in the field and includes two chapters by miroslav krstic to whom this volume is dedicated this volume is suitable for all researchers in mathematics and engineering who deal with nonlinear delay control problems and students who would like to understand the current state of the art in the control of nonlinear delay systems

graph embedding for pattern recognition covers theory methods computation and applications widely used in statistics machine learning image processing and computer vision this book presents the latest advances in graph embedding theories such as nonlinear manifold graph linearization method graph based subspace analysis l1 graph hypergraph undirected graph and graph in vector spaces real world applications of these theories are spanned broadly in dimensionality reduction

subspace learning manifold learning clustering classification and feature selection a selective group of experts contribute to different chapters of this book which provides a comprehensive perspective of this field

there are plenty of challenging and interesting problems open for investigation in the field of switched systems stability issues help to generate many complex nonlinear dynamic behaviors within switched systems the authors present a thorough investigation of stability effects on three broad classes of switching mechanism arbitrary switching where stability represents robustness to unpredictable and undesirable perturbation constrained switching including random within a known stochastic distribution dwell time with a known minimum duration for each subsystem and autonomously generated with a pre assigned mechanism switching and designed switching in which a measurable and freely assigned switching mechanism contributes to stability by acting as a control input for each of these classes this book propounds detailed stability analysis and or design related robustness and performance issues connections to other control problems and many motivating and illustrative examples

dimensionality reduction also known as manifold learning is an area of machine learning used for extracting informative features from data for better representation of data or separation between classes this book presents a cohesive review of linear and nonlinear dimensionality reduction and manifold learning three main aspects of dimensionality reduction are covered spectral dimensionality reduction probabilistic dimensionality reduction and neural network based dimensionality reduction which have geometric probabilistic and information theoretic points of view to dimensionality reduction respectively the necessary background and preliminaries on linear algebra optimization and kernels are also explained to ensure a comprehensive understanding of the algorithms the tools introduced in this book can be applied to various applications involving feature extraction image processing computer vision and signal processing this book is applicable to a wide audience who would like to acquire a deep understanding of the various ways to extract transform and understand the structure of data the intended audiences are academics students and industry professionals academic researchers and students can use this book as a textbook for machine learning and dimensionality reduction data scientists machine learning scientists computer vision scientists and computer scientists can use this book as a reference it can also be helpful to statisticians in the field of statistical learning and applied mathematicians in the fields of manifolds and subspace analysis industry professionals including applied engineers data engineers and engineers in various fields of science dealing with machine learning can use this as a guidebook for feature extraction from their data as the raw data in industry often require

preprocessing the book is grounded in theory but provides thorough explanations and diverse examples to improve the reader's comprehension of the advanced topics advanced methods are explained in a step by step manner so that readers of all levels can follow the reasoning and come to a deep understanding of the concepts this book does not assume advanced theoretical background in machine learning and provides necessary background although an undergraduate level background in linear algebra and calculus is recommended

this proceedings contains the papers presented at the 9th ifac airtc 2000 symposium on artificial intelligence in real time control 2000 held at budapest polytechnic hungary on 2 4 october airtc 2000 builds on the excellent reputation of previous meetings in the series for providing top quality papers in this important research field a positive development illustrated by this proceedings is a new trend towards pragmatism in the research field examples of this trend are an increase in the number of actual industrial applications support for more widespread use of new sophisticated technologies e g materials design further intertwining of artificial intelligence and control theory methods that reduces the reliance on blind faith still too often associated with ai methods many things have changed since the first airtc event in 1988 two examples illustrate the change in the general attitude of the ifac family in 1990 one of the major closing presentations of the ifac world congress warned the control community about the coming hordes of ai people in 1999 one of the plenary papers at the ifac world congress pointed out that the ai based methods form a natural extension of control theory to the class of non linear systems with incomplete information at least as far as the optimisation is concerned this contrast in attitudes shows how during the past decade many ai people have embraced control theory and many control people have learned the basics of ai this proceedings serves to continue this excellent dialogue by providing many quality papers which link both fields

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| Do Chickens Have Large Talons? A Closer Look at Avian Feet

Chickens, ubiquitous backyard birds and a cornerstone of the poultry industry, are often perceived as docile and somewhat clumsy creatures. This perception, however, often overlooks the fascinating adaptations present in their feet, specifically their talons. This article aims to delve into the anatomy of a chicken's foot, clarifying the size and function of their talons and dispelling any misconceptions surrounding their supposed lack of sharpness or size. We will explore their various uses, from scratching for food to defense mechanisms.

| The Anatomy of a Chicken's Foot: More Than Meets the Eye

A chicken's foot, scientifically termed a pes, is a remarkably well-engineered structure. It consists of four toes: three pointing forward and one pointing backward. This arrangement provides exceptional grip and stability, crucial for perching, walking, and scratching. Each toe terminates in a claw, often mistakenly referred to as a talon. While not as dramatically curved or large as those found on raptors like eagles or hawks, a chicken's claw is still a significant feature, possessing notable sharpness and strength. The claws themselves are composed of keratin, the same protein that makes up human fingernails and hair. They grow continuously throughout the chicken's life, much like our nails, requiring periodic trimming to prevent overgrown claws that can hinder mobility and cause discomfort. The size and sharpness of these claws vary based on several factors, including breed, age, and the type of surface the chicken regularly interacts with.

Size and Shape Variations: Breed and Lifestyle Influence

The size of a chicken's claws isn't uniform across all breeds. Heavier breeds, such as Orpingtons or Cochins, often have thicker, slightly larger claws compared to lighter breeds like Leghorns or Anconas. This difference is likely due to the increased weight bearing on their feet. Furthermore, chickens raised in free-range environments, constantly scratching the ground for insects and seeds, tend to have more worn-down and shorter claws than those kept in confined spaces with softer flooring. For instance, a free-range Rhode Island Red will likely have shorter, blunter claws than a similarly aged Rhode Island Red kept in a coop with concrete flooring. The shape also plays a role. While not technically "talons" in the sense of raptorial birds, a chicken's claws are still curved, allowing for effective gripping and digging. The curvature, however, is less pronounced than that of a predatory bird, reflecting their different ecological niches.

The Function of Chicken Claws: More Than Just Scratching

The primary function of a chicken's claws is undoubtedly scratching. They use their strong legs and sharp claws to efficiently dig through soil and leaf litter, uncovering seeds, insects, and other food sources. This behavior is essential for their survival and is observed throughout their daily routine. Observe a chicken foraging – the rhythmic scratching action is a testament to the power and precision of their claws. Beyond foraging, the claws also provide crucial traction, especially when perching or navigating uneven terrain. The backward-facing toe offers additional support, preventing slips and falls. Finally, while not their primary defense mechanism, chickens can use their claws defensively, especially when threatened or protecting their young. They can inflict painful scratches, a deterrent to potential predators or aggressive conspecifics.

Dispelling the Myth of "Small" Claws

The perception that chickens have small or insignificant claws is largely a matter of comparison. Compared to the formidable talons of an eagle or hawk, a chicken's claws might seem less impressive. However, this comparison is inherently flawed.

Chicken claws are perfectly adapted to their specific needs and lifestyle, serving their purpose effectively. Their size and sharpness are sufficient for their foraging, locomotion, and defensive requirements. Calling them "small" is misleading; they are appropriately sized for their function within their ecological niche.

Conclusion: Understanding Chicken Claws

In conclusion, while chickens do not possess the dramatically large and curved talons of predatory birds, their claws are far from insignificant. They are functional, appropriately sized tools crucial for survival, playing vital roles in foraging, locomotion, and defense. Understanding the anatomy and function of a chicken's feet provides insight into the intricate adaptations that allow these seemingly simple birds to thrive.

FAQs

1. Do chickens need their claws trimmed? Yes, particularly if they are kept in confined spaces with limited opportunity to naturally wear down their claws. Overgrown claws can cause discomfort and hinder mobility. 2. How often should I trim my chicken's claws? This depends on the breed and environment. Regular inspection (every few weeks) is recommended, with trimming necessary when the claws appear excessively long or start to curl. 3. How can I safely trim my chicken's claws? Use sharp, avian-specific clippers. Be careful not to cut into the quick (the pink part of the claw containing blood vessels and nerves), which can cause bleeding and pain. 4. Can I use human nail clippers on chickens? While possible, avian clippers are designed for the unique curvature and thickness of chicken claws, making the process safer and more efficient. 5. What are signs of an infection in a chicken's claw? Swelling, redness, discharge, or limping are all potential indicators requiring veterinary attention.

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