

Soccer Prediction For Today Matches

This proceeding discuss the latest solutions, scientific findings and methods for solving intriguing problems in the fields of data mining, computational intelligence, big data analytics, and soft computing. This gathers outstanding papers from the fifth International Conference on “Computational Intelligence in Data Mining” (ICCIDM), and offer a “sneak preview” of the strengths and weaknesses of trending applications, together with exciting advances in computational intelligence, data mining, and related fields.

Match outlook offers revolutionary ways to predict soccer matches and win on soccerbetting, by analyzing the teams and exploiting the tendencies, and probabilities of the outcomes you choose to wager oncorrectly.The book not only arms you with strategies that helps to level the bookies edge over you, but sets out the simple steps to follow to predictsoccer matches correctly, as well as select home win, away win, BTTS, etc.The book also contians predictive models that capture relationshipsamong factors that enable easy assessments of teams and matches.The core of the predictive models relies on probabilistic causation, which has the properties and anticedence, and contiquity that enableyou to predict as much as 89% of matches accurately, out performing the bookmakers predictions whose accuracy is far lower.The book also contains many examples of situations and circumstancesthat give rise to very high probability of specific outcomes, and this makes the information truly cutting edge.consequently, it is a highly recommened book that gurantees a rewarding read for any one wishing to go beyound the tired cliché and flawed convictions that dominates how to win at soccer betting.If you have been losing your money to the bookies this is the book fory

For any organization to be successful, it must operate in such a manner that knowledge and information, human resources, and technology are continually taken into consideration and managed effectively. Business concepts are always present regardless of the field or industry – in education, government, healthcare, not-for-profit, engineering, hospitality/tourism, among others. Maintaining organizational awareness and a strategic frame of mind is critical to meeting goals, gaining competitive advantage, and ultimately ensuring sustainability. The Encyclopedia of Organizational Knowledge, Administration, and Technology is an inaugural five-volume publication that offers 193 completely new and previously unpublished articles authored by leading experts on the latest concepts, issues, challenges, innovations, and opportunities covering all aspects of modern organizations. Moreover, it is comprised of content that highlights major breakthroughs, discoveries, and authoritative research results as they pertain to all aspects of organizational growth and development including methodologies that can help companies thrive and analytical tools that assess an organization’s internal health and performance. Insights are offered in key topics such as organizational structure, strategic leadership, information technology management, and business analytics, among others. The knowledge compiled in this publication is designed for entrepreneurs, managers, executives, investors, economic analysts, computer engineers, software programmers, human resource departments, and other industry professionals seeking to understand the latest tools to emerge from this field and who are looking to incorporate them in their practice. Additionally, academicians, researchers, and students in fields that include but are not limited to business, management science, organizational development, entrepreneurship, sociology, corporate psychology, computer science, and information technology will benefit from the research compiled within this publication.

"Now in a fully revised and updated third edition, Science and Soccer is still the most comprehensive and accessible introduction to the physiology, biomechanics and psychology behind the world's most popular sport. Offering important guidance on how science translates into practice, the book examines every key facet of the sport, with a particular focus on the development of elite performers. The topics covered include: - anatomy, physiology, psychology and biomechanics; - principles of training; - nutrition; - physical and mental preparation; - playing surfaces and equipment; - decision-making and skill acquisition; - coaching and coach education; - performance analysis; - talent identification and youth development. Science and Soccer: Developing Elite Performers is a unique resource for students and academics working in sports science. It is essential reading for all professional support staff working in the game, including coaches at all levels, physiotherapists, conditioning specialists, performance analysts, club doctors and sport psychologists"--

“A beautiful story, expertly told.” —Per Mertesacker, Arsenal defender and member of the German national team, winners of the 2014 World Cup Estádio do Maracanã, July 13, 2014, the last ten minutes of extra time in the World Cup Final: German forward Mario Götze jumps to meet a floated pass from André Schürrle, cushions the ball with his chest, and in one fluid motion volleys the ball past the onrushing Argentine goalkeeper into the far corner of the net. The goal wins Germany the World Cup for the first time in almost thirty years. As the crowd roars, Götze looks dazed, unable to comprehend what he has done. In *Das Reboot*, Raphael Honigstein charts the return of German soccer from the dreary functionality of the late 1990s to Götze's moment of sublime, balletic genius and asks: How did this come about? The answer takes him from California to Stuttgart, from Munich to the Maracanã, via Dortmund and Amsterdam. Packed with exclusive interviews with key figures, including Jürgen Klinsmann, Thomas Müller, Oliver Bierhoff, and many more, Honigstein's book reveals the secrets of German soccer's success.

A 195-page monograph by a top-1% Netflix Prize contestant. Learn about the famous machine learning competition. Improve your machine learning skills. Learn how to build recommender systems. What's inside:introduction to predictive modeling,a comprehensive summary of the Netflix Prize, the most known machine learning competition, with a \$1M prize,detailed description of a top-50 Netflix Prize solution predicting movie ratings,summary of the most important methods published - RMSE's from different papers listed and grouped in one place,detailed analysis of matrix factorizations / regularized SVD,how to interpret the factorization results - new, most informative movie genres,how to adapt the algorithms developed for the Netflix Prize to calculate good quality personalized recommendations,dealing with the cold-start: simple content-based augmentation,description of two rating-based recommender systems,commentary on everything: novel and unique insights, know-how from over 9 years of practicing and analysing predictive modeling.

A very simple introduction to the sport of soccer and how it is played.

'Football looked at in a very different way' Pat Nevin, former Chelsea and Everton star and football media analyst Football – the most mathematical of sports. From shot statistics and league tables to the geometry of passing and managerial strategy, the modern game is filled with numbers, patterns and shapes. How do we make sense of them? The answer lies in the mathematical models applied in biology, physics and economics. Soccermatics brings football and mathematics together in a mind-bending synthesis, using numbers to help reveal the inner workings of the beautiful game. This new and expanded edition analyses the current big-name players and teams using mathematics, and meets the professionals working inside football who use numbers and statistics to boost performance. Welcome to the world of mathematical modelling, expressed brilliantly by David Sumpter through the prism of football. No matter who you follow – from your local non-league side to the big boys of the Premiership, La Liga, the Bundesliga, Serie A or the MLS – you'll be amazed at what mathematics has to teach us about the world's favourite sport.

The three-volume set LNCS 10860, 10861 and 10862 constitutes the proceedings of the 18th International Conference on Computational Science, ICCS 2018, held in Wuxi, China, in June 2018. The total of 155 full and 66 short papers presented in this book set was carefully reviewed and selected from 404 submissions. The papers were organized in topical sections named:

Part I: ICCS Main Track Part II: Track of Advances in High-Performance Computational Earth Sciences: Applications and Frameworks; Track of Agent-Based Simulations, Adaptive Algorithms and Solvers; Track of Applications of Matrix Methods in Artificial Intelligence and Machine Learning; Track of Architecture, Languages, Compilation and Hardware Support for Emerging ManYcore Systems; Track of Biomedical and Bioinformatics Challenges for Computer Science; Track of Computational Finance and Business Intelligence; Track of Computational Optimization, Modelling and Simulation; Track of Data, Modeling, and Computation in IoT and Smart Systems; Track of Data-Driven Computational Sciences; Track of Mathematical-Methods-and-Algorithms for Extreme Scale; Track of Multiscale Modelling and Simulation Part III: Track of Simulations of Flow and Transport: Modeling, Algorithms and Computation; Track of Solving Problems with Uncertainties; Track of Teaching Computational Science; Poster Papers

This book offers a collection of high-quality peer-reviewed research papers presented at the Second International Conference on Communication and Computational Technologies (ICCCT 2019), held at Rajasthan Institute of Engineering and Technology, Jaipur, Rajasthan, India, on 30–31 August 2019. In contributions prepared by researchers from academia and industry alike, the book discusses a wide variety of industrial, engineering and scientific applications of emerging techniques.

This book includes the proceedings of the Intelligent and Fuzzy Techniques INFUS 2019 Conference, held in Istanbul, Turkey, on July 23–25, 2019. Big data analytics refers to the strategy of analyzing large volumes of data, or big data, gathered from a wide variety of sources, including social networks, videos, digital images, sensors, and sales transaction records. Big data analytics allows data scientists and various other users to evaluate large volumes of transaction data and other data sources that traditional business systems would be unable to tackle. Data-driven and knowledge-driven approaches and techniques have been widely used in intelligent decision-making, and they are increasingly attracting attention due to their importance and effectiveness in addressing uncertainty and incompleteness. INFUS 2019 focused on intelligent and fuzzy systems with applications in big data analytics and decision-making, providing an international forum that brought together those actively involved in areas of interest to data science and knowledge engineering. These proceeding feature about 150 peer-reviewed papers from countries such as China, Iran, Turkey, Malaysia, India, USA, Spain, France, Poland, Mexico, Bulgaria, Algeria, Pakistan, Australia, Lebanon, and Czech Republic.

Information technologies have evolved to an enabling science for natural resource management and conservation, environmental engineering, scientific simulation and integrated assessment studies. Computing plays a significant role in every day practices of environmental engineers, natural scientists, economists, and social scientists. The complexity of natural phenomena requires interdisciplinary approaches, where computing science offers the infrastructure for environmental data collection and management, scientific simulations, decision support documentation and reporting. Ecology, environmental engineering and natural resource management comprise an excellent real-world testbed for IT system demonstration, while raising new challenges for computer science. Complexity, uncertainty and scaling issues of natural systems form a demanding application domain for sensor networks and earth observation systems; modelling, simulation and scientific workflows, data management and reporting, decision support and intelligent systems, distributed computing environments, geographical information systems, heterogeneous systems integration, software engineering, accounting systems and control systems. This books offers a collection of papers presented at the 4th International Symposium on Environmental Engineering, held in May 2009, in Thessaloniki, Greece. Recent success stories in ecoinformatics, promising ideas and new challenges are discussed among computer scientists, environmental engineers, economists and social scientists, demonstrating new paradigms for problem solving and decision making.

Appealing to a wide audience, this ground-breaking handbook takes an in-depth look at soccer match analysis, highlighting the latest in match analysis research and the innovative technologies now being used by professional soccer clubs around the world. Bridging the gap between research, theory and practice, these methods can be used by coaches, sport scientists and fitness coaches to assess and improve: styles of play, technical ability and physical fitness objective performance feedback to players the development of specific training routines use of available notation software, video analysis and manual systems understanding of current academic research in soccer notational analysis. This is the first book to focus exclusively on football, and is based on the authors' extensive experience in academic and professional match analysis.

There are many methods of predicting sports results with astrology. Here are some that work. Journey with a student as he makes his voyage towards knowledge at the feet of a Master Astrologer. With the assistance of his pet raven and a bad-tempered yak, the Master leads him - and you - step by step through the analysis of over 60 charts, covering a wide range of sports. This detailed engagement with the practice of chart judgement is unique in astrological writing, making this book invaluable not only to sports fans, but to anyone with an interest in predictive astrology.

Accurate predictions are essential in many areas such as corporate decision making, weather forecasting and technology forecasting. Prediction markets help to aggregate information and gain a better understanding of the future by leveraging the wisdom of the crowds. Trading prices in prediction markets thus reflect the traders' aggregated expectations on the outcome of uncertain future events and can be used to predict the likelihood of these events. This book demonstrates that markets are accurate predictors. Results from several empirical studies reported in this work show the importance of designing such markets properly in order to derive valuable predictions. Therefore, the findings are valuable for designing future prediction markets.

"An elegant and amusing account" of how gambling has been reshaped by the application of science and revealed the truth behind a lucky bet (Wall Street Journal). For the past 500 years, gamblers-led by mathematicians and scientists-have been trying to figure out how to pull the rug out from under Lady Luck. In *The Perfect Bet*, mathematician and award-winning writer Adam Kucharski tells the astonishing story of how the experts have succeeded, revolutionizing mathematics and science in the process. The house can seem unbeatable. Kucharski shows us just why it isn't. Even better, he demonstrates how the search for the perfect bet has been crucial for the scientific pursuit of a better world.

Gambling is a significant global industry, which is worth around 0.6% of world trade, that is, around US\$ 384 billion; and gambling on the outcome of sports events is a very popular pastime for millions of people around the world, who combine a bet with watching and enjoying their favourite sports. But, like any other human activity, sports betting is open to corruption and improper influence from unscrupulous sports persons, bookmakers and others. Sports betting in the last ten years or so has developed and changed quite fundamentally with the advent of modern technology – not least the omnipresence of the Internet and the rise of on-line sports betting. This book covers the law and policy on

sports betting in more than forty countries around the world whose economic and social development, history and culture are quite different. Several chapters deal with the United States of America. This book also includes a review of sports betting under European Union (EU) Law. The book appears in the ASSER International Sports Law Series, under the editorship of Dr. Robert Siekmann, Dr. Janwillem Soek and Marco van der Harst LL.M.

The essence of any sports contest is competition. The very unpredictability of a sporting outcome distinguishes it from, say, an opera performance. This volume presents a state of the art overview of the economics of competitive sport along two main th

The Expected Goals method is football's best-kept secret. The metric gives unparalleled insight into which teams and players are performing at the highest level. Professional gamblers have used Expected Goals to make millions through football betting. Club scouts have used Expected Goals to identify hidden gems in the transfer market. And the media have recently started using Expected Goals to offer more profound insight in their broadcasts. Despite this, most ordinary fans still don't understand what the Expected Goals method is - or appreciate the significant impact that it is set to have on the sport in coming years. Expected Goals (otherwise known as xG) was originally conjured up by a small corner of the online football analytics community. It didn't take long for professional gamblers to begin using xG to predict match outcomes. These bettors utilised the Expected Goals method to turn over hundreds of millions of pounds from the bookmakers. Before long, football clubs had caught on to the ground-breaking insight given by xG. Brentford FC were leaders in this field, managing to assemble a Play-Off-reaching squad on a shoe-string budget. In the last five years, the small West London side have turned over more than £100m in transfer revenue from their use of the Expected Goals method in player recruitment. More recently, the Expected Goals method has been adopted by the media as a form of insight. Fans are finally catching on to the pioneering means of football analysis. Soon enough, anyone who doesn't understand the Expected Goals philosophy will be left behind. "This book will make you watch football differently" - Tobias Pedersen "Possibly the most ground-breaking football book ever written" - Football Impact "A brilliant account of the history and future of Expected Goals" - StatShot

What is performance analysis and how does its use benefit sports performance? How can you use performance analysis in your sport? The Essentials of Performance Analysis answers your questions, providing a complete guide to the foundational elements of match and performance analysis for new students and beginners. As well as a basic introduction to the sport science and theory that underlies performance analysis, the book contains many practical examples to show performance analysis in its applied context. It includes discussion of: approaches to analyzing sport performance the use of feedback technologies the use of video and biomechanical analysis interpreting data coaching with notational analysis. The Essentials of Performance Analysis is a straightforward, concise and authoritative guide for students of sport science and sports coaching, as well as for coaches and athletes looking to develop their insight into sports performance analysis.

Match OutlookThe Ultimate Guide on how to Predict Soccer Matches and Win on Soccer Betting

This book constitutes the proceedings of the 25th International Symposium on Foundations of Intelligent Systems, ISMIS 2020, held in Graz, Austria, in October 2020. The conference was held virtually due to the COVID-19 pandemic. The 35 full and 8 short papers presented in this volume were carefully reviewed and selected from 79 submissions. Included is also one invited talk. The papers deal with topics such as natural language processing; deep learning and embeddings; digital signal processing; modelling and reasoning; and machine learning applications.

Issues in Psychology and Psychiatry Research and Practice: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Psychology and Psychiatry Research and Practice. The editors have built Issues in Psychology and Psychiatry Research and Practice: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Psychology and Psychiatry Research and Practice in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Psychology and Psychiatry Research and Practice: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

This two-volume set LNCS 12789 and 12790 constitutes the refereed proceedings of the Third International Conference on HCI in Games, HCI-Games 2021, held as part of the 23rd International Conference, HCI International 2021, which took place in July 2021. Due to COVID-19 pandemic the conference was held virtually. The total of 1276 papers and 241 posters included in the 39 HCII 2021 proceedings volumes was carefully reviewed and selected from 5222 submissions. The papers of HCI-Games 2021, Part I, are organized in topical sections named: Experience Design in Games; User Engagement and Game Impact; Game Mechanics.

The book presents the proceedings of two conferences: the 16th International Conference on Data Science (ICDATA 2020) and the 19th International Conference on Information & Knowledge Engineering (IKE 2020), which took place in Las Vegas, NV, USA, July 27-30, 2020. The conferences are part of the larger 2020 World Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE'20), which features 20 major tracks. Papers cover all aspects of Data Science, Data Mining, Machine Learning, Artificial and Computational Intelligence (ICDATA) and Information Retrieval Systems, Information & Knowledge Engineering, Management and Cyber-Learning (IKE). Authors include academics, researchers, professionals, and students.

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Includes papers on topics from data mining to machine learning to informational retrieval systems; Authors include academics, researchers, professionals and students.

How does one effectively aggregate disparate pieces of information that are spread among many different individuals? In other words, how does one best access the 'wisdom of the crowd'? Prediction markets, which are essentially speculative markets created for the purpose of aggregating information and making predictions, offer the answer to this question. The effective use of these markets has the potential not only to help forecast future events on a national and international level, but also to assist companies, for example, in providing improved estimates of the potential market size for a new product idea or the launch date of new products and services. The markets have already been used to forecast uncertain outcomes ranging from influenza to the spread of infectious diseases, to the demand for hospital services, to the box office success of movies, climate change, vote shares and election outcomes, to the probability of meeting project deadlines. The insights gained also have many potentially valuable applications for public policy more generally. These markets offer substantial promise as a tool of information aggregation as well as forecasting, whether alone or as a supplement to other mechanisms like opinion surveys, group deliberations, panels of experts and focus groups. Moreover, they can be applied at a macroeconomic and microeconomic level to yield information that is valuable for government and commercial policy-makers and which can be used for a number of social purposes. This volume of original readings, contributed by many of the leading experts in the field, marks a significant addition to the base of knowledge about this fascinating subject area. The book should be of interest to anyone looking at monetary economics, economic forecasting and microeconomics.

This brief highlights the application of performance analysis tools in data acquisition, and various machine learning algorithms for evaluating team performance as well as talent identification in beach soccer and sepak takraw. Numerous performance indicators and human performance parameters are considered based on their relevance to each sport. The findings presented here demonstrate that the key performance indicators as well as human performance parameters can be used in the future evaluation of team performance as well as talent identification in these sports. Accordingly, they offer a valuable resource for coaches, club managers, talent identification experts, performance analysts and other relevant stakeholders involved in performance assessments.

This book constitutes the proceedings of the 11th RoboCup International Symposium, held in Atlanta, GA, USA, in July 2007, immediately after the 2007 RoboCup Soccer, RoboCup Rescue and RoboCup Junior competitions. Papers presented at the symposium focused on topics related to these three events and to artificial intelligence and robotics in general. The 18 revised full papers and 42 revised poster papers included in the book were selected from 133 submissions. Each paper was reviewed by at least three program committee members. The program committee also nominated two papers for the Best Paper and Best Student Paper awards, respectively. The book provides a valuable source of reference and inspiration for R&D professionals and educationalists active or interested in robotics and artificial intelligence.

Now in a fully revised and updated second edition, *Essentials of Performance Analysis in Sport* is a comprehensive and authoritative guide to this core discipline of contemporary sport science. It introduces the fundamental theory of match and performance analysis, using real-world illustrative examples and data throughout, and explores the applied contexts in which analysis can have a significant influence on performance. This second edition includes three completely new chapters covering the key emerging topics of dynamic systems, momentum and performance profiling, as well as updated coverage of core topics in the performance analysis curriculum such as: designing notation systems analysing performance data qualitative analysis of technique time-motion analysis probability using feedback technologies performance analysis and coaching. With extended coverage of contemporary issues in performance analysis and contributions from leading performance analysis researchers and practitioners, *Essentials of Performance Analysis in Sport* is a complete textbook for any performance analysis course, as well as an invaluable reference for sport science or sport coaching students and researchers, and any coach, analyst or athlete looking to develop their professional insight.

Puzzles.

This book features selected research papers presented at the Second International Conference on Computing, Communications, and Cyber-Security (IC4S 2020), organized in Krishna Engineering College (KEC), Ghaziabad, India, along with Academic Associates; Southern Federal University, Russia; IAC Educational, India; and ITS Mohan Nagar, Ghaziabad, India during 3 October 2020. It includes innovative work from researchers, leading innovators, and professionals in the area of communication and network technologies, advanced computing technologies, data analytics and intelligent learning, the latest electrical and electronics trends, and security and privacy issues.

Drawing on ten years of ethnographic data collected from multi-sited field research, Ling's book traces the journeys of dozens of second-generation migrants from middle school to the labor market in Shanghai and reveals the ongoing process of inclusion and exclusion that shapes the politics of citizenship in urban China.

This book constitutes the refereed post-conference proceedings of the 5th International Workshop on Machine Learning and Data Mining for Sports Analytics, MLSA 2018, colocated with ECML/PKDD 2018, in Dublin, Ireland, in September 2018. The 12 full papers presented together with 4 challenge papers were carefully reviewed and selected from 24 submissions. The papers present a variety of topics, covering the team sports American football, basketball, ice hockey, and soccer, as well as the individual sports cycling and martial arts. In addition, four challenge papers are included, reporting on how to predict pass receivers in soccer.

This book constitutes the proceedings of the 22nd International Conference on Discovery Science, DS 2019, held in Split, Croatia, in October 2019. The 21 full and 19 short papers presented together with 3 abstracts of invited talks in this volume were carefully reviewed and selected from 63 submissions. The scope of the conference includes the development and analysis of methods for discovering scientific knowledge, coming from machine learning, data mining, intelligent data analysis, big data analysis as well as their application in various scientific domains. The papers are organized in the following topical sections: Advanced Machine Learning; Applications; Data and Knowledge Representation; Feature Importance; Interpretable Machine Learning; Networks; Pattern Discovery; and Time Series.

Statistics for Sport and Exercise Studies guides the student through the full research process, from selecting the most appropriate statistical procedure, to analysing data, to the presentation of results, illustrating every key step in the process with clear examples, case-studies and data taken from real sport and exercise settings. Every chapter includes a range of features designed to help the student grasp the underlying concepts and relate each statistical procedure to their own research project, including definitions of key terms, practical exercises, worked examples and clear summaries. The book also offers an in-depth and practical guide to using SPSS in sport and exercise research, the most commonly used data analysis software in sport and exercise departments. In addition, a companion website includes

more than 100 downloadable data sets and work sheets for use in or out of the classroom, full solutions to exercises contained in the book, plus over 1,300 PowerPoint slides for use by tutors and lecturers. Statistics for Sport and Exercise Studies is a complete, user-friendly introduction to the use of statistical tests, techniques and procedures in sport, exercise and related subjects. Visit the companion website at: www.routledge.com/cw/odonoghue

This book constitutes the refereed proceedings of the 16th International Conference on Knowledge-Based and Intelligent Information and Engineering Systems, KES 2012, held in San Sebastian, Spain, in September 2012. The 20 revised full papers presented were carefully reviewed and selected from 130 submissions. The papers are organized in topical sections on bioinspired and machine learning methods, machine learning applications, semantics and ontology based techniques, and lattice computing and games.

Predicting the outcomes of soccer matches is curious to numerous; from fans to supporters. Prediction about the outcomes of soccer matches is also very exciting and enticing as a research problem, especially due to its complications, exertion, unexpected inferences etc. Consequently, a soccer match is relying upon various factors, actors and unpredictable situations. Therefore, it is very agonizing and uphill task to predict the meticulous and close to truth-based results of soccer matches. Such a research demands a multi-criteria decision-making approach, i.e. TOPSIS, to foresee accurate ranking and applied to the fallouts of FIFA 2018 world cup soccer matches explicitly.

This book constitutes revised selected papers from the 6th International Conference on Robot Intelligence Technology and Applications, RiTA 2018, held in Putrajaya, Malaysia, in December 2018. The 20 full papers presented in this volume were carefully reviewed and selected from 80 submissions. The papers present studies on machine learning; optimization; modelling and simulation; path planning; neural networks; landmark recognition; and reinforcement learning.

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