

Simulating Bird Strike On Aircraft Composite Wing Leading Edge

These volumes comprise papers, on the topic of "Materials Processing Technology", selected from the second International Conference on Advances in Materials and Manufacturing (ICAMMP 2011) held on the 16-18th December 2011 in Guilin, China. The 469 peer-reviewed papers are grouped into the chapters: 1: Advanced Engineering Materials, 2: Surface Engineering/Coatings, 3: Materials Forming, Machining and Joining, 4: Laser Processing, 5: Powder Metallurgy and Plastic Deformation, 6: Friction and Wear, 7: Waste-to-Energy, Waste Management and Waste Disposal, 8: CAD/CAE/CAM, 9: Product Design and Development, 10: Other Related Topics.

Americans have become resigned to seeing Congress vote money for porkbarrel projects of all kinds-roads, dams, post offices, military installations-in the districts of influential legislators. In recent years Congress has, almost without public notice, extended this form of vote-buying and pandering into a new domain: science. Where formerly scientific funding proposals were evaluated by outside experts on the basis of merit, there is now an increasing consideration of congressional districts and "fair" geographical distribution. In this ground-breaking volume, Joseph P. Martino offers a critical examination of special-interest funding and the danger it poses to the integrity of American society as a whole, as well as to its scientific component. Science Funding is distinguished by its comprehensive approach to the structural and historical background of the current situation. It examines the history of science funding from the early twentieth century through present, public vs. to taxpayers, instances of fraud, and the effects of government funding for research in universities. Martino's survey demonstrates conclusively that government has been inefficient in its funding capacity and that the shortcomings are inherent: political criteria for the support of science, congressional micromanagement, freezing out of innovative ideas, and the favoring of massive projects-Big Science-over small, but significant experimental programs. In his concluding chapter Martino provides an agenda for new thinking on the funding of science. He proposes alternatives that suggest a plurality of approaches is preferable to the current monolithic model, and shows how industrial support, philanthropy, and contributions from the public can be made more effective. Science Funding is a major work on the interaction of science, politics, and society. It will be of interest to sociologists, policymakers, and political scientist, and the research science community.

Terrorism: Commentary on Security Documents is a series that provides primary source documents and expert commentary on various topics relating to the worldwide effort to combat terrorism, as well as efforts by the United States and other nations to protect their national security interests. Volume 144, Autonomous and Semiautonomous Weapons Systems, examines the impact of robots and autonomous and semiautonomous weapons systems on the waging of modern warfare. It considers the likely effects of emerging technological innovations in this area from both a political and strategic standpoint, in addition to considering the implications of such technologies within the context of the law of armed conflict and international humanitarian law. This volume is divided into three sections: (1) U.S. policy and approaches to the use of autonomous and semiautonomous weapons systems; (2) U.S. armed forces use of such weapons systems; and (3) potential terrorist use of such weapons systems. Official policy documents from the DoD and the U.S. Army and Air Force are complemented by reports from the Strategic Studies Institute/Army War College Press and other U.S. military sources.

Groundbreaking Handbook Offers Detailed Research and Valuable Methodology to Address Dangerous and Costly Aviation Hazard Though annual damages from bird and bat collisions with aircraft have been estimated at \$400 million in the United States and up to \$1.2 billion in commercial aviation worldwide and despite numerous conferences and councils dedicated to the issue, very little has been published on this expensive and sometimes-lethal flying risk. Bird Strike in Aviation seeks to fill this gap, providing a comprehensive guide to preventing and minimizing damage caused by bird strike on aircraft. Based on a thorough and comprehensive examination of the subject, Dr. El-Sayed offers different approaches to reducing bird strikes, including detailed coverage of the three categories necessary for such reduction, namely, awareness/education, bird management (active and passive control), and aircraft design. In addition, the text discusses the importance of cooperation between airplanes, airports and air traffic authorities as well as testing methods necessary for certification of both aircraft frame and engine. Other notable features include: Statistics and analyses for bird strikes with both civil and military helicopters as well as military fixed wing aircrafts, including annual costs, critical flight altitudes, critical parts of aircraft, distance from air base and specifics of date and timing Thorough review and analysis all fatal bird strike accidents and most non-fatal accidents since 1905, the first book to provide such a reference The use of numerical methods in analyzing historic data (ex. probability functions, finite element methods for analyzing impact on aircraft structure, experimental measurement technique for displacement, vibration, component distortion, etc.) Instruction on identification of bird species (using visual, microscopic, and DNA evidence) and details of bird migration to aid air traffic control in avoiding scenarios likely to result in collision With its wealth of statistical data, innovative research, and practical suggestions, Bird Strike in Aviation will prove a vital resource for researchers, engineers and graduate students in aerospace engineering/manufacturing or ornithology, as well as for military and civilian pilots and flight crew or professionals in aviation authorities and air traffic control.

This volume presents selected papers presented during the National Aerospace Propulsion Conference (NAPC) held at Indian Institute of Technology Kharagpur. It brings together contributions from the entire propulsion community, spanning air-breathing and non-air-breathing propulsion. The papers cover aerospace propulsion-related topics, and discuss relevant research advances made in this field. It will be of interest to researchers in industry and academia working on gas turbine, rocket, and jet engines.

Dynamic Behavior of Materials, Volume 1: Proceedings of the 2012 Annual Conference on Experimental and Applied Mechanics represents one of seven volumes of technical papers presented at the Society for Experimental Mechanics SEM 12th International Congress & Exposition on Experimental and Applied Mechanics, held at Costa Mesa, California, June 11-14, 2012. The full set of proceedings also includes volumes on Challenges in Mechanics of Time -Dependent Materials and Processes in Conventional and Multifunctional Materials, Imaging Methods for Novel Materials and Challenging Applications, Experimental and Applied Mechanics, 2nd International Symposium on the Mechanics of Biological Systems and Materials 13th International Symposium on MEMS and Nanotechnology and, Composite Materials and the 1st International Symposium on Joining Technologies for Composites.

This book gathers outstanding papers on numerical modeling in Mechanical Engineering (Volume 2) as part of the proceedings of the 1st International Conference on Numerical Modeling in Engineering (NME 2018), which was held in Ghent, Belgium. The overall objective of the conference was to bring together international scientists and engineers in academia and industry from fields related to advanced numerical techniques, such as the finite element method (FEM), boundary element method (BEM), isogeometric analysis (IGA), etc., and their applications to a wide range of engineering disciplines. This book addresses various industrial engineering applications of numerical simulations to Mechanical and Materials Engineering, including: Aerospace applications, Acoustic analysis, Biomechanical applications, Contact problems and wear, Heat transfer analysis, Vibration and dynamics, Transient analysis, Nonlinear analysis, Composite materials, Polymers, Metal alloys, Fracture mechanics, Fatigue of materials, Creep behavior, Phase transformation, and Crystal plasticity.

This book presents the proceedings of the 2019 International Scientific and Technical Conference "Integrated Computer Technologies in Mechanical Engineering" – Synergetic Engineering (ICTM' 2019). The ICTM was established by the National Aerospace University "Kharkiv Aviation Institute" to bring together outstanding researchers and practitioners in the fields of information technology in the design and manufacture of engines, creation of rocket space systems, and aerospace engineering from around the globe all to share their knowledge and expertise. The ICTM'2019 conference was held in Kharkiv, Ukraine, on November 28–30, 2019. During the event, technical exchanges between the research communities took place in the form of

keynote speeches, panel discussions, and special sessions. In addition, participants had the opportunity to forge new collaborations with their fellow researchers. ICTM'2019 received 172 submissions from various countries. This book features selected papers offering insights into the following topics: Information technology in the design and manufacture of engines; Information technology in the creation of rocket space systems; Aerospace engineering; Transport systems and logistics; Big data and data science; Nano-modeling; Artificial intelligence and smart systems; Networks and communication; Cyber-physical system and IoE; Software Engineering and IT-infrastructure. The organizers of ICTM 2019 made great efforts to ensure the success of this conference. The authors would like to thank all the members of the ICTM'2019 Advisory Committee for their guidance and advice, the members of Program Committee and Organizing Committee, the referees for their time and effort in reviewing and soliciting the papers, and the authors for their contributions to the formation of a common intellectual environment for solving relevant scientific problems. Also, the authors are grateful to Springer, especially Janusz Kacprzyk and Thomas Ditzinger as the editors responsible for the series "Advances in Intelligent System and Computing" for their valuable support in publishing these selected papers.

"One of the major threats to Aviation industry is the in-flight impact of birds. Aircraft windshields are intensively vulnerable to damage and hence need a certification requirement for a proven level of impact resistance. Bird strike experiments are very expensive and henceforth explicit numerical modeling techniques have grown importance. This compilation mainly relies on the theory of hydrodynamic impact and addresses basic shockwave equations. A smooth particle hydrodynamics based approach is chosen and the numerical simulation is carried out using contact-impact coupling algorithm. The simulation is run using the nonlinear explicit finite element code LSDYNA ver.971, developed by Lawrence Livermore National Laboratories. A traditional design of experiments approach, factorial design, has been utilized to facilitate the economical prediction of factors significantly affecting the pressure response in the bird strike analysis. Impact velocity, bird mass, bird aspect ratio, porosity and obliquity of impact are the various parameters investigated in the present work. The results show that main effects velocity and obliquity of impact, and 'porosity x obliquity' interaction effect, are the factors significantly affecting the pressure response in a bird strike analysis"--Abstract, leaf iii.

How many rivets and bolts hold the wings of a Boeing 777 plane together? Why does an astronaut's spacesuit have a layer of liquid-cooled underwear? Who puts the jam in doughnuts? Find out the answers to these questions and much, much more in Stephen Biesty's Incredible Cross-Sections of Everything. His intricate artwork will have children and adults alike poring over every detail, whether it's following the production line of a factory making newspapers or exploring the insides of the Saturn V rocket. Taking you through every stage of each process is Chester the Tester, a character who helps explain how things are made, along with his sidekick Hector the Inspector. Written with humor and fascinating facts to guide you through the illustrations, this book is a glorious way to learn about the world around you. First published 25 years ago, Stephen Biesty's Incredible Cross-Sections series has been updated for the silver anniversary, bringing delight to a whole new generation of curious young readers.

This book functions as a practical guide for the use of simulation in anesthesiology. Divided into five parts, it begins with the history of simulation in anesthesiology, its relevant pedagogical principles, and the modes of its employment. Readers are then provided with a comprehensive review of simulation technologies as employed in anesthesiology and are guided on the use of simulation for a variety of learners: undergraduate and graduate medical trainees, practicing anesthesiologists, and allied health providers. Subsequent chapters provide a 'how-to' guide for the employment of simulation across wide range of anesthesiology subspecialties before concluding with a proposed roadmap for the future of translational simulation in healthcare. The Comprehensive Textbook of Healthcare Simulation: Anesthesiology is written and edited by leaders in the field and includes hundreds of high-quality color surgical illustrations and photographs.

This current book comprises state-of-the-art research results in the field of mechatronics and reliable systems engineering, gathering papers from almost all continents. Since the chapters represent contributions of research scholars who work in both governmental financed institutions and in the business environment, one could infer that they certainly reflect a clear picture of the developments in these cutting-edge sciences. Moreover, the contributions are not limited to mechatronics, as nowadays it has grown to embed all smart technical sciences. Medical applications based on nano-technologies seemingly the most promising of all newly developed branches could not be left out of this work. It is our belief that the book is useful to both students, who want to learn from the best scholars (as most of the authors hold a Ph.D. degree and are well-known professors), and to researchers in all areas of smart engineering, who will definitely find here hot topics meant to inspire them in their line of work.

Polymer matrix composites are increasingly replacing traditional materials, such as metals, for applications in the aerospace, automotive and marine industries. Because of the relatively recent development of these composites there is extensive on-going research to improve the understanding and modelling of their behaviour – particularly their failure processes. As a consequence there is a strong demand among design engineers for the latest information on this behaviour in order to fully exploit the potential of these materials for a wide range of weight-sensitive applications. Failure mechanisms in polymer matrix composites explores the main types of composite failure and examines their implications in specific applications. Part one discusses various failure mechanisms, including a consideration of manufacturing defects and addressing a variety of loading forms such as impact and the implications for structural integrity. This part also reviews testing techniques and modelling methods for predicting potential failure in composites. Part two investigates the effects of polymer-matrix composite failure in a range of industries including aerospace, automotive and other transport, defence, marine and off-shore applications. Recycling issues and environmental factors affecting the use of composite materials are also considered. With its distinguished editors and international team of expert contributors Failure mechanisms in polymer matrix composites is a valuable reference for designers, scientists and research and development managers working in the increasing range of industries in which composite materials are extensively used. The book will also be a useful guide for academics studying in the composites field. Discusses various failure mechanisms, including manufacturing defects Reviews testing techniques and modelling methods for predicting potential failure Investigates failure in aerospace, automotive, defence, marine and off-shore applications

One of the most important and exciting areas of composites research is the development of modelling techniques to predict the response of composite materials to different types of stress. Predictive modelling provides the opportunity both to understand better how composites behave in different conditions and to develop materials with enhanced performance for particular industrial applications. Multi-scale modelling of composite material systems summarises the key research in this area and its implications for industry. The book covers modelling approaches ranging from the micron to the metre in scale, and from the single fibre to

complete composite structures. Individual chapters discuss a variety of material types from laminates and fibre-reinforced composites to monolithic and sandwich composites. They also analyse a range of types of stress and stress response from fracture and impact to wear and fatigue. Authors also discuss the strengths and weaknesses of particular models. With its distinguished editors and international team of contributors, *Multi-scale modelling of composite material systems* is a standard reference for both academics and manufacturers in such areas as aerospace, automotive and civil engineering. Extensive coverage of this important and exciting area of composites research. Understand how composites behave in different circumstances. Compiled by an expert panel of authors and editors.

Advances in computer, visual display, motion and force cueing and other technologies in the past two decades have had a dramatic effect on the design and use of simulation technology in aviation and other fields. The effective use of technology in training, safety investigation, engineering and scientific research requires an understanding of its capabilities and limitations. As the technology has as its primary goal the creation of virtual environments for human users, knowledge of human sensory, perceptual, and cognitive functioning is also needed. This book provides a review and analysis of the relevant engineering and science supporting the design and use of advanced flight simulation technologies. It includes chapters reviewing key simulation areas such as visual scene, motion, and sound simulation and a chapter analyzing the role of recreating the pilot's task environment in the overall effectiveness of simulators. The design and use of flight simulation are addressed in chapters on the effectiveness of flight simulators in training and on the role of physical and psychological fidelity in simulator design. The problems inherent in the ground-based simulation of flight are also reviewed as are promising developments in flight simulation technology and the important role flight simulators play in advanced aviation research. The readership includes: flight simulation engineers and designers, human factors researchers and practitioners, aviation safety investigators, flight training management and instructors, training and instructional technologists, virtual environment design community, and regulatory authorities.

This book explores topics at the interface between mechanical and chemical engineering, with a focus on design, simulation, and manufacturing. Covering recent developments in the mechanics of solids and structures; numerical simulation of coupled problems, including wearing, compression, detonation and collision; and chemical process technologies, including ultrasonic technology, capillary rising process, pneumatic classification, membrane electrolysis and absorption processes, it reports on developments in the field of heat and mass transfer, energy-efficient technologies, and industrial ecology. Part of a two-volume set based on the 3rd International Conference on Design, Simulation, Manufacturing: The Innovation Exchange (DSMIE-2020), held on June 9-12, 2020, in Kharkiv, Ukraine, this book provides academics and professionals with extensive information on the latest trends, technologies and challenges in the field as well as practical lessons learned.

Forensic Engineering: The Art and Craft of a Failure Detective synthesizes the current academic knowledge, with advances in process and techniques developed in the last several years, to bring forensic materials and engineering analysis into the 21st century. The techniques covered in the book are applied to the myriad types of cases the forensic engineer and investigator may face, serving as a working manual for practitioners. Analytical techniques and practical, applied engineering principles are illustrated in such cases as patent and intellectual property disputes, building and product failures, faulty design, air and rail disasters, automobile recalls, and civil and criminal cases. Both private and criminal cases are covered as well as the legal obligation, requirements, and responsibilities under the law, particularly in cases of serious injury or even death. *Forensic Engineering* will appeal to professionals working in failure analysis, loss adjustment, occupational health and safety as well as professionals working in a legal capacity in cases of produce failure and liability—including criminal cases, fraud investigation, and private consultants in engineering and forensic engineering.

This book gathers the latest advances, innovations, and applications in the field of mechanical engineering, as presented by leading international researchers and engineers at the 2020 International Conference on Mechanical Engineering and Materials (ICMEM), held in Beijing, China on October 16-17, 2020. ICMEM covers all aspects of mechanical engineering and material sciences, such as computer-aided design, virtual design and design visualization, intelligent design, usability design, automobile structure, human-machine interface design, manufacturing engineering, aerospace engineering, automation and robotics, micro-machining, MEMS/ NEMS, composite materials, biomaterials, smart materials, superconducting materials, materials properties and applications, materials manufacturing, nanotechnology, nano-materials and nano-composites, etc. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations.

Bird strikes are a major risk to an aircraft especially during the take-off and landing stages. It may result in significant loss of human life and property damages worth millions annually in the US alone. This research is aimed at development of a computer-based modelling and analysis of a large 8-lb bird on an aircraft engine, and comparing the results with those from impact analysis of a smaller 4-lb bird. As the current Federal Aviation Regulation (FAR) are based on the utilization of smaller 4-lb bird only, this research helps in examining whether the use of a small bird is appropriate, or consideration should also be given to larger bird impact testing. In this study, the Smooth Particle Hydrodynamics (SPH) technique is used to model the 4-lb bird. This model is validated by simulating its impact it on different aluminium plates. Various parameters such as deformation, Von Mises stresses, forces and impulse are recorded and compared with the experimental values. Similarly, the large 8-lb bird model is created, and it is numerically impacted on the same metal plate, and the results are compared with the ones from small 4-lb bird impact model. Detailed geometry on an aircraft jet engine is then modelled in CATIA V5, while meshing is done in the Hypermesh. The bird models (4-lb and 8-lb) are impacted on the rotor blades of an aircraft engine using the LS-Dyna, according to the FAR 33.76 regulation. Results obtained in these simulations are compared, and failure damage of the engine is quantified. The study shows that damage caused by a large 8-lb bird model could be significantly larger than that of a smaller 4-lb bird model. Thus, this study proposes that the use of large 8-lb should be considered in FAR regulations for aircraft components including engine certifications.

Composites materials have aroused a great interest over the last few decades. Several applications of fibrous composites, functionally graded materials, laminated composites, nano-structured reinforcements, morphing structures, can be found in many engineering fields, such as aerospace, mechanical, naval and civil engineering. The necessity of lightweight structures, smart and adaptive systems, high-level strength, have led both the academic research and the manufacturing development to a recurring employment of these materials. Many journal papers and technical notes have been published extensively over the last seventy years in international scientific journals of different engineering fields. For this reason, the establishment of this second edition of *Mechanics of Composites International Conference* has appeared appropriate to continue what has been begun during the first edition occurred in 2014 at Stony Brook University (USA). MECHCOMP wants to be an occasion for many researchers from each part of the globe to meet and discuss about the recent advancements regarding the use of composite structures. As a proof of this event, which has taken place in Porto (Portugal), selected plenary and key-note lectures have been collected in the present book.

Long-Term Durability of Polymeric Matrix Composites presents a comprehensive knowledge-set of matrix, fiber and interphase behavior under long-term aging conditions, theoretical modeling and experimental methods. This book covers long-term constituent behavior, predictive methodologies, experimental validation and design practice. Readers will also find a discussion of various applications, including aging air craft structures, aging civil infrastructure, in addition to engines and high temperature applications.

The Comprehensive Textbook of Healthcare Simulation is a cohesive, single-source reference on all aspects of

simulation in medical education and evaluation. It covers the use of simulation in training in each specialty and is aimed at healthcare educators and administrators who are developing their own simulation centers or programs and professional organizations looking to incorporate the technology into their credentialing process. For those already involved in simulation, the book will serve as a state-of-the-art reference that helps them increase their knowledge base, expand their simulation program's capabilities, and attract new, additional target learners. Features:

- Written and edited by pioneers and experts in healthcare simulation
- Personal memoirs from simulation pioneers
- Each medical specialty covered
- Guidance on teaching in the simulated environment
- Up-to-date information on current techniques and technologies
- Tips from "insiders" on funding, development, accreditation, and marketing of simulation centers
- Floor plans of simulation centers from across the United States
- Comprehensive glossary of terminology

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in Scientific and technical aerospace reports (STAR) and International aerospace abstracts (IAA)

Bird Strike An Experimental, Theoretical and Numerical Investigation Woodhead Publishing

This volume presents original research contributed to the 3rd Annual International Conference on Computational Mathematics and Computational Geometry (CMCGS 2014), organized and administered by Global Science and Technology Forum (GSTF). Computational Mathematics and Computational Geometry are closely related subjects, but are often studied by separate communities and published in different venues. This volume is unique in its combination of these topics. After the conference, which took place in Singapore, selected contributions chosen for this volume and peer-reviewed. The section on Computational Mathematics contains papers that are concerned with developing new and efficient numerical algorithms for mathematical sciences or scientific computing. They also cover analysis of such algorithms to assess accuracy and reliability. The parts of this project that are related to Computational Geometry aim to develop effective and efficient algorithms for geometrical applications such as representation and computation of surfaces. Other sections in the volume cover Pure Mathematics and Statistics ranging from partial differential equations to matrix analysis, finite difference or finite element methods and function approximation. This volume will appeal to advanced students and researchers in these areas.

The Three-Volume-Set CCIS 323, 324, 325 (AsiaSim 2012) together with the Two-Volume-Set CCIS 326, 327 (ICSC 2012) constitutes the refereed proceedings of the Asia Simulation Conference, AsiaSim 2012, and the International Conference on System Simulation, ICSC 2012, held in Shanghai, China, in October 2012. The 267 revised full papers presented were carefully reviewed and selected from 906 submissions. The papers are organized in topical sections on modeling theory and technology; modeling and simulation technology on synthesized environment and virtual reality environment; pervasive computing and simulation technology; embedded computing and simulation technology; verification, validation and accreditation technology; networked modeling and simulation technology; modeling and simulation technology of continuous system, discrete system, hybrid system, and intelligent system; high performance computing and simulation technology; cloud simulation technology; modeling and simulation technology of complex system and open, complex, huge system; simulation based acquisition and virtual prototyping engineering technology; simulator; simulation language and intelligent simulation system; parallel and distributed software; CAD, CAE, CAM, CIMS, VP, VM, and VR; visualization; computing and simulation applications in science and engineering; computing and simulation applications in management, society and economics; computing and simulation applications in life and biomedical engineering; computing and simulation applications in energy and environment; computing and simulation applications in education; computing and simulation applications in military field; computing and simulation applications in medical field.

This book addresses conference topics such as information technology in the design and manufacture of engines; information technology in the creation of rocket space systems; aerospace engineering; transport systems and logistics; big data and data science; nano-modeling; artificial intelligence and smart systems; networks and communication; cyber-physical systems and IoE; and software engineering and IT infrastructure. The International Scientific and Technical Conference "Integrated Computer Technologies in Mechanical Engineering" - Synergetic Engineering (ICTM) was formed to bring together outstanding researchers and practitioners in the field of information technology, and whose work involves the design and manufacture of engines, creation of rocket space systems, and aerospace engineering, from all over the world to share their experiences and expertise. It was established by the National Aerospace University "Kharkiv Aviation Institute." The ICTM'2020 conference was held in Kharkiv, Ukraine on October 28-30, 2020. .

The papers in this book were the object of strict peer-review, and cover the latest advances in, and applications of, advanced design technology, CAD/CAM/CAE, mechanical dynamics, friction and wear and advanced manufacturing technologies.

The book presents high-quality research papers presented at the first international conference, ICICCD 2016, organised by the Department of Electronics, Instrumentation and Control Engineering of University of Petroleum and Energy Studies, Dehradun on 2nd and 3rd April, 2016. The book is broadly divided into three sections: Intelligent Communication, Intelligent Control and Intelligent Devices. The areas covered under these sections are wireless communication and radio technologies, optical communication, communication hardware evolution, machine-to-machine communication networks, routing techniques, network analytics, network applications and services, satellite and space communications, technologies for e-communication, wireless Ad-Hoc and sensor networks, communications and information security, signal processing for communications, communication software, microwave informatics, robotics and automation, optimization techniques and algorithms, intelligent transport, mechatronics system, guidance and navigation, algorithms, linear/non-linear control, home automation, sensors, smart cities, control systems, high

performance computing, cognition control, adaptive control, distributed control, prediction models, hybrid control system, control applications, power system, manufacturing, agriculture cyber physical system, network control system, genetic control based, wearable devices, nano devices, MEMS, bio-inspired computing, embedded and real-time software, VLSI and embedded systems, FPGA, digital system and logic design, image and video processing, machine vision, medical imaging, and reconfigurable computing systems.

Issues in Engineering Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Engineering Research and Application. The editors have built Issues in Engineering Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Engineering Research and Application 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 Engineering Research and Application: 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 book gathers the proceedings of the 4th International Conference on Mechanical Engineering and Applied Composite Materials (MEACM), held in Beijing, China on October 24-25, 2020. The conference brought together researchers from several countries and covered all major areas of mechanical engineering and applied composite materials, new applications and current trends. The topics covered include: structure and design, mechanical manufacturing and automation, robotics and mechatronics, mechanical behavior of nanomaterials, nanocomposites, and composite mechanics. Given its scope, the book offers a source of information and inspiration for researchers seeking to improve their work and gather new ideas for future developments.

Bird strikes represent a serious economic and safety risk to aircraft operations, especially near airports where aircraft are in critical stages of flight with little room for error. The United States Federal Aviation Administration (FAA) continues to research ways of mitigating the risk to aircraft posed by bird targets which include surveillance of birds with specialized radar systems. This thesis presents an algorithm that can utilize data from an avian radar, Automatic Dependent Surveillance - Broadcast (ADS-B) aircraft positioning data, and other sources to determine which birds constitute a significant risk to aircraft. It is envisioned that this algorithm could be added into a system which then alerts air traffic control (ATC) and/or pilots through communication protocols such as ADS-B and the ATC ground network. For this thesis, avian radar and ADS-B data was analyzed and tested through the prototype algorithm with a simulated aircraft track to illustrate example scenarios of this algorithm working. Additionally, multiple scenarios with a single simulated bird and simulated aircraft track were tested to verify operation of the algorithm when a known collision occurs.

Bird strikes are one of the most dangerous threats to civil and military flight safety: between 1960 and 2014, they were responsible for the destruction of approximately 150 civil aircraft and the deaths of 271 people. Bird Strike presents a summary of the damage imposed on the aviation industries by their avian counterparts. This book first presents and analyzes the statistics obtained from bird strike databases and offers various methods for minimizing the overall probability of bird-strike events. The next chapters explore how to analyze the ability of aero-engine critical structures to withstand bird-strike events by implementing reliable experimental, theoretical, and numerical methods. Finally, the book investigates the impact of bird strikes on different components of aircrafts, such as the metal fuselage, composite fuselage, engines, wings, and tail, and proposes two new bird models, with explanations of their use. Provides up-to-date information for aviation staff and researchers working on aircraft safety Offers comprehensive investigations on all the statistical, theoretical, experimental, and numerical aspects of bird strike Includes studies carried out on bird strike and provides the reader with the important findings of each paper

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