

Best Naca Airfoil For Wind Turbine

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

This book presents the select proceedings of the International Conference on Recent Advancements in Mechanical Engineering (ICRAME 2020). It provides a comprehensive overview of the various technical challenges faced, their systematic investigation, contemporary developments, and future perspectives in the domain of mechanical engineering. The book covers a wide array of topics including fluid flow techniques, compressible flows, waste management and waste disposal, bio-fuels, renewable energy, cryogenic applications, computing in applied mechanics, product design, dynamics and control of structures, fracture and failure mechanics, solid mechanics, finite element analysis, tribology, nano-mechanics and MEMS, robotics, supply chain management and logistics, intelligent manufacturing system, rapid prototyping and reverse engineering, quality control and reliability, conventional and non-conventional machining, and ergonomics. This book can be useful for students and researchers interested in mechanical engineering and its allied fields.

Annual Report of the National Advisory Committee for Aeronautics

With Emphasis on Darrieus Concept

And Its Impact on Flying Machines

Principles of Helicopter Aerodynamics with CD Extra

Research Abstracts

Technical Note

"The main objective of this research was to investigate the lift and drag characteristics of a stepped airfoil with backward facing steps; apply active flow control technique to enhance the aerodynamic performance of stepped airfoils and examine the possibility of using such airfoils on Unmanned Aerial Vehicles (UAV's). A step was introduced at mid-chord, with a depth of 50% of the airfoil thickness at mid-chord position extending till the trailing edge of a NACA 4415 airfoil. Computational studies were conducted with the use of passive flow control constituting the activation of step and active flow control with the use of air injecting jets placed in the step cavity of the NACA 4415 airfoil with a goal of enhancing the aerodynamic performance. The jet angle and jet momentum coefficient were varied independently to identify the best setting for optimizing the aerodynamic performance of the stepped airfoil. Experimental studies of the same airfoil were conducted in a wind tunnel for a range of Reynolds numbers to validate some of the numerical results obtained for the cases of base and stepped airfoils. The results produced show that as much as 37% increase in C1 and as much as 12% increase in L/D ratios over conventional airfoil values could be obtained using stepped airfoils and further enhancement could be made with the employment of jets placed in the step cavities. The case study conducted as a part of this research focuses on the UAV RQ-2 Pioneer employing a stepped airfoil configuration by comparing its aerodynamic characteristics with the conventional NACA 4415 airfoil originally used on this aircraft. The primary objective of the case study was to identify and outline a step schedule for the flight envelope of the UAV Pioneer using a stepped airfoil configuration while applying active flow control to obtain enhanced aerodynamic performance over conventional NACA 4415 airfoil originally used and hence improve the flight performance characteristics like Range and Endurance of the aircraft"--Abstract, leaf iii.

Includes the Committee's Reports no. 1-1058, reprinted in v. 1-37.

Model Research

The Wind and Beyond

A History of Aerodynamics

Applied Methods and Procedures

Hearings Before the Committee on Commerce, Science, and Transportation, United States Senate, Ninety-fifth Congress, First Session, on S. 365 ...

Report

Inhaltsangabe:Abstract: Wind energy is an increasingly import source of renewable, clean energy. In spite of this, only the methods and the materials of construction have improved over time, while the basic working principle of the wind turbine is still the same as it was centuries ago. In this thesis we have increased the power of a wind turbine by a factor of 4 in a fluid dynamic simulation, using a very simple external shroud system. We have also extended the theory of wind turbines (limit of Betz), to include this new kind of device and show why past attempts to augment the power of a wind turbine by means of shroud systems have failed. A detailed analysis of the device and its functioning principle is presented in this thesis - optimization studies need to be done in the future. Inhaltsverzeichnis:Table of Contents: AbstractI IndexII List of FiguresIV List of SymbolsVI Introduction1 1.Theory of Wind Turbines5 1.2The Betz Law6 1.3Aerodynamics of the rotor13 1.4Rotor Power Characteristics18 1.5Number of Rotor Blades20 1.6Horizontal Axis Wind Turbines (HAWT)22 1.7Shrouded / Ducted Wind Turbines28 1.7.1Ducted Rotor29 1.7.2Turbine with a Diffuser Duct29 2.Methodology33 2.1Introduction33

2.2Computational Domain34 2.3Computational Code41 2.3.1Conservation Equations42 2.3.2K-Epsilon Turbulence Model43 2.3.3Discretization of the Conservation Equations45 2.4MFR - Multiple Frame of Reference45 2.5Parallel Processing46 2.6Simulations47 3.Results48 3.1Introduction48 3.2Conventional Turbine49 3.2.1Velocity Field52 3.2.2Static Pressure Field52 3.2.3Total Pressure Field53 3.2.4Power of the Conventional Turbine55 3.2.5Energy and Momentum Transfer57 3.3Shrouded Turbine59 3.3.1Velocity Field59 3.3.2Static Pressure Field62 3.3.3Total Pressure Field63 3.3.4Power of the Shrouded Turbine65 3.3.5Energy and Momentum Transfer66 3.3.6The Betz Limit68 3.3.7Cross Check Analysis with Traditional Shrouded Turbines69 Conclusions72 Bibliography73 Acknowledgments

Authoritative, highly readable history of aerodynamics and the major theorists and their contributions.

General Aviation and Community Development

A Documentary Journey Into the History of Aerodynamics in America: Reinventing the Airplane

Recent Developments in Mathematical, Statistical and Computational Sciences

Mustang Designer

Air Force

Engineer in Charge

General Aviation Aircraft Design, Second Edition, continues to be the engineer's best source for answers to realistic aircraft design questions. The book has been expanded to provide design guidance for additional classes of aircraft, including seaplanes, biplanes, UAS, high-speed business jets, and electric airplanes. In addition to conventional powerplants, design guidance for battery systems, electric motors, and complete electric powertrains is offered. The second edition contains Stability and Control Lateral and Directional Stability and Control These new chapters offer multiple practical methods to simplify the estimation of stability derivatives and introduce hinge moments and basic control system design. Furthermore, all chapters have been reorganized and feature updated material with additional analysis methods. This edition also provides an introduction to design optimization using a wing optimization as an example for the beginner. Written by an eng professional engineers, aircraft designers, aerodynamicists, structural analysts, performance analysts, researchers, and aerospace engineering students will value the book as the classic go-to for aircraft design. The printed book is now in color, with 1011 figures and illustrations! Presents the most common methods for conceptual aircraft design Clear presentation splits text into shaded regions, separating engineering topics from mathematical derivations and examples Design top All chapters feature updated material with additional analysis methods. Many chapters have been reorganized for further help. Introduction to design optimization is provided using a wing optimization as an example for the beginner Three new chapters are offered, two of which focus on stability and control. These offer multiple practical methods to simplify the estimation of stability derivatives. The chapters introduce hinge moments and basic control system design Real-world ex Helicopters are highly capable and useful rotating-wing aircraft with roles that encompass a variety of civilian and military applications. Their usefulness lies in their unique ability to take off and land vertically, to hover stationary relative to the ground, and to fly forward, backward, or sideways. These unique flying qualities, however, come at a high cost including complex aerodynamic problems, significant vibrations, high levels of noise, and relatively large power requirements comp Internationally recognized expert, provides a thorough, modern treatment of the aerodynamic principles of helicopters and other rotating-wing vertical lift aircraft. Every chapter is extensively illustrated and concludes with a bibliography and homework problems. Advanced undergraduate and graduate students, practising engineers, and researchers will welcome this thorough and up-to-date text on rotating-wing aerodynamics.

Annual Report - National Advisory Committee for Aeronautics

WarTime Report

The Characteristics of 78 Related Airfoil Section from Tests in the Variable-density Wind Tunnel

LOW SPEED AERODYNAMICS

Informatics and Management Science III

The National Advisory Committee for Aeronautics, 1915-1958

The International Conference on Informatics and Management Science (IMS) 2012 will be held on November 16-19, 2012, in Chongqing, China, which is organized by Chongqing Normal University, Chongqing University, Shanghai Jiao Tong University, Nanyang Technological University, University of Michigan, Chongqing University of Arts and Sciences, and sponsored by National Natural Science Foundation of China (NSFC). The objective of IMS 2012 is to facilitate an exchange of information on best practices for the latest research advances in a range of areas. Informatics and Management Science contains over 600 contributions to suggest and inspire solutions and methods drawing from multiple disciplines including: Computer Science Communications and Electrical Engineering Management Science Service Science Business Intelligence

The results of tests of six airfoils having the N.A.C.A. 230 mean line and varying in thickness from 0.06c to 0.21c are presented. These results agree with previous findings in showing that aerodynamically the best section is one of moderate thickness. The data are of value mainly in connection with the design of tapered wings having sections based on the N.A.C.A. 230 mean line.

Investigation of the Variation of Maximum Lift for a Pitching Airplane Model and Comparison with Flight Results

Tests of N.A.C.A. Airfoils in the Variable-density Wind Tunnel

Correlation of Cylinder-head Temperatures and Coolant Heat Rejections of a Multicylinder, Liquid-cooled Engine of 1710-cubic-inch Displacement

Recent Advances in Mechanical Engineering

Design of Unmanned Aerial Systems

Scientific and Technical Aerospace Reports

Mustang Designer tells the story of American wartime fighter development, including engines and armaments, as part of a nationwide program of aircraft builders and filers, focusing on Edgar Schmued, the designer of the Mustang. The P-51 Mustang is widely regarded as the best propeller-driven fighter that ever flew. What many might not realize is that the plane's developer was a German migrant. This book tells of how Schmued created a weapon that would ultimately prove lethal to the aspirations of those who had seized control over his native land.

The depletion of global fossil fuel reserves combined with mounting environmental concerns has served to focus attention on the development of ecologically compatible and renewable alternative sources of energy. Wind energy, with its impressive growth rate of 40% over the last five years, is the fastest growing alternate source of energy in the world since its purely economic potential is complemented by its great positive environmental impact. The wind turbine, whether it may be a Horizontal Axis Wind Turbine (HAWT) or a Vertical Axis Wind Turbine (VAWT), has become an important source of energy.

Journal of Energy

Official Service Journal of the U.S. Army Air Forces

Verti-Flite

Wind Turbine Design

Progress In Sustainable Energy Technologies: Generating Renewable Energy

Solar Energy Update

Apparatus was developed which utilized a pitching airplane model to determine maximum wing loads as a function of the rate of change of angle of attack. In order to evaluate the pitching-model technique, the maximum lift coefficient was determined as a function of the rate of change of angle of attack over a Mach number range from approximately 0.2 to 0.6 in wind-tunnel tests of a 1/20-scale model of a conventional single-engine fighter airplane and was compared with existing flight data of this airplane. The wind-tunnel and flight results were found to be in good agreement.

The book aims at explaining the fundamental principles of aerodynamics from an engineer's point of view. Right from the beginning, it conveys a basic understanding of the behaviour of the real viscous fluid. Later, through appropriate approximations, the ideal inviscid fluid is introduced. It gives a clear exposition of the fundamentals of fluid dynamics, both viscous and inviscid, including the topic of boundary layer. The text provides introductory concepts of wind tunnel and measurements to give a balanced overview of the subject so that the students are exposed to experiments and laboratory practices at the outset. It emphasises the physics of various aspects of the fluid flow phenomenon so that the reader develops a "physical feel" of the subject. This book is primarily intended for the undergraduate students of aeronautical engineering and aerospace engineering. KEY FEATURES • Use of a large number of flow visualisation photographs for illustration • Use of a large number of innovative diagrams • Adequate number of worked-out examples at the end of almost all the chapters • A set of exercise problems at the end of every chapter

Series 20

Report - National Advisory Committee for Aeronautics

NASA Authorization for Fiscal Year 1978

Select Proceedings of ICRAME 2020

I. 1-787

General Aviation Aircraft Design

This multi-disciplinary volume presents information on the state-of-the-art in sustainable energy technologies key to tackling the world's energy challenges and achieving environmentally benign solutions. Its unique amalgamation of the latest technical information, research findings and examples of successfully applied new developments in the area of sustainable energy will be of keen interest to engineers, students, practitioners, scientists and researchers working with sustainable energy technologies. Problem statements, projections, new concepts, models, experiments, measurements and simulations from not only engineering and science, but disciplines as diverse as ecology, education, economics and information technology are included, in order to create a truly holistic vision of the sustainable energy field. The contributions feature coverage of topics including solar and wind energy, biomass and biofuels, waste-to-energy, renewable fuels, geothermal and hydrogen power, efficiency gains in fossil fuels and energy storage technologies including batteries and fuel cells.

Written by an internationally recognized teacher and researcher, this book provides a thorough, modern treatment of the aerodynamic principles of helicopters and other rotating-wing vertical lift aircraft such as tilt rotors and autogiros. The text begins with a unique technical history of helicopter flight, and then covers basic methods of rotor aerodynamic analysis, and related issues associated with the performance of the helicopter and its aerodynamic design. It goes on to cover more advanced topics in helicopter aerodynamics, including airfoil flows, unsteady aerodynamics, dynamic stall, and rotor wakes, and rotor-airframe aerodynamic interactions, with final chapters on autogiros and advanced methods of helicopter aerodynamic analysis. Extensively illustrated throughout, each chapter includes a set of homework problems. Advanced undergraduate and graduate students, practising engineers, and researchers will welcome this thoroughly revised and updated text on rotating-wing aerodynamics.

Edgar Schmued and the P-51

Principles of Helicopter Aerodynamics

Technical Note - National Advisory Committee for Aeronautics

Technical Aerodynamics

A History of the Langley Aeronautical Laboratory, 1917-1958

Enhancing the Aerodynamic Performance of Stepped Airfoils

The airplane ranks as one of history's most ingenious and phenomenal inventions. It has surely been one of the most world changing. How ideas about aerodynamics first came together and how the science and technology evolved to forge the airplane into the revolutionary machine that it became is the epic story told in this six-volume series, The Wind and Beyond: A Documentary Journey through the History of Aerodynamics in America. Following up on Volume I's account of the invention of the airplane and the creation of the original aeronautical research establishment in the United States, Volume II explores the airplane design revolution of the 1920s and 1930s and the quest for improved airfoils. Subsequent volumes cover the aerodynamics of airships, flying boats, rotary-wing aircraft, breaking the sound barrier, and more.

This book constitutes an up-to-date account of principles, methods, and tools for mathematical and statistical modelling in a wide range of research fields, including medicine, health sciences, biology, environmental science, engineering, physics, chemistry, computation, finance, economics, and social sciences. It presents original solutions to real-world problems, emphasizes the coordinated development of theories and applications, and promotes interdisciplinary collaboration among mathematicians, statisticians, and researchers in other disciplines. Based on a highly successful

meeting, the International Conference on Applied Mathematics, Modeling and Computational Science, AMMCS 2019, held from August 18 to 23, 2019, on the main campus of Wilfrid Laurier University, Waterloo, Canada, the contributions are the results of submissions from the conference participants. They provide readers with a broader view of the methods, ideas and tools used in mathematical, statistical and computational sciences.

CFD Analysis of the Characteristics of a Shrouded Turbine

Energy Research Abstracts

The V AMMCS International Conference, Waterloo, Canada, August 18-23, 2019

The High-speed Frontier. Case Histories of Four NACA Programs, 1920 - 1950

Provides a comprehensive introduction to the design and analysis of unmanned aircraft systems with a systems perspective Written for students and engineers who are new to the field of unmanned aerial vehicle design, this book teaches the many UAV design techniques being used today and demonstrates how to apply aeronautical science concepts to their design. Design of Unmanned Aerial Systems covers the design of UAVs in three sections—vehicle design, autopilot design, and ground systems design—in a way that allows readers to fully comprehend the science behind the subject so that they can then demonstrate creativity in the application of these concepts on their own. It teaches students and engineers all about: UAV classifications, design groups, design requirements, mission planning, conceptual design, detail design, and design procedures. It provides them with in-depth knowledge of ground stations, power systems, propulsion systems, automatic flight control systems, guidance systems, navigation systems, and launch and recovery systems. Students will also learn about payloads, manufacturing considerations, design challenges, flight software, microcontroller, and design examples. In addition, the book places major emphasis on the automatic flight control systems and autopilots. Provides design steps and procedures for each major component Presents several fully solved, step-by-step examples at component level Includes numerous UAV figures/images to emphasize the application of the concepts Describes real stories that stress the significance of safety in UAV design Offers various UAV configurations, geometries, and weight data to demonstrate the real-world applications and examples Covers a variety of design techniques/processes such that the designer has freedom and flexibility to satisfy the design requirements in several ways Features many end-of-chapter problems for readers to practice Design of Unmanned Aerial Systems is an excellent text for courses in the design of unmanned aerial vehicles at both the upper division undergraduate and beginning graduate levels.