

1. Record Nr.	UNINA9910830969203321
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Titolo	Engineering design via surrogate modelling : a practical guide / / Alexander I.J. Forrester, Andras Sobester, and Andy J. Keane, University of Southampton, UK
Pubbl/distr/stampa	Chichester, West Sussex, England : , : Wiley, , 2008 ©2008
ISBN	0-470-77080-5 1-281-84101-3 9786611841010 1-61583-477-X 0-470-77079-1
Descrizione fisica	1 online resource (xviii, 210 pages) : illustrations (some colour)
Disciplina	620.0044 620/.0042015118
Soggetti	Engineering design - Mathematical models Engineering design - Statistical methods
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Engineering Design via Surrogate Modelling; Contents; Preface; About the Authors; Foreword; Prologue; Part I Fundamentals; 1 Sampling Plans; 1.1 The 'Curse of Dimensionality' and How to Avoid It; 1.2 Physical versus Computational Experiments; 1.3 Designing Preliminary Experiments (Screening); 1.3.1 Estimating the Distribution of Elementary Effects; 1.4 Designing a Sampling Plan; 1.4.1 Stratification; 1.4.2 Latin Squares and Random Latin Hypercubes; 1.4.3 Space-filling Latin Hypercubes; 1.4.4 Space-filling Subsets; 1.5 A Note on Harmonic Responses; 1.6 Some Pointers for Further Reading References 2 Constructing a Surrogate; 2.1 The Modelling Process; 2.1.1 Stage One: Preparing the Data and Choosing a Modelling Approach; 2.1.2 Stage Two: Parameter Estimation and Training; 2.1.3 Stage Three: Model Testing; 2.2 Polynomial Models; 2.2.1 Example One: Aerofoil Drag; 2.2.2 Example Two: a Multimodal Testcase; 2.2.3 What About the k-variable Case?; 2.3 Radial Basis Function Models; 2.3.1 Fitting Noise-

Free Data; 2.3.2 Radial Basis Function Models of Noisy Data; 2.4 Kriging; 2.4.1 Building the Kriging Model; 2.4.2 Kriging Prediction; 2.5 Support Vector Regression
2.5.1 The Support Vector Predictor; 2.5.2 The Kernel Trick; 2.5.3 Finding the Support Vectors; 2.5.4 Finding ; 2.5.5 Choosing C and ; 2.5.6 Computing : -SVR; 2.6 The Big(ger) Picture; References; 3 Exploring and Exploiting a Surrogate; 3.1 Searching the Surrogate; 3.2 Infill Criteria; 3.2.1 Prediction Based Exploitation; 3.2.2 Error Based Exploration; 3.2.3 Balanced Exploitation and Exploration; 3.2.4 Conditional Likelihood Approaches; 3.2.5 Other Methods; 3.3 Managing a Surrogate Based Optimization Process; 3.3.1 Which Surrogate for What Use?
3.3.2 How Many Sample Plan and Infill Points?; 3.3.3 Convergence Criteria; 3.4 Search of the Vibration Isolator Geometry Feasibility Using Kriging Goal Seeking; References; Part II Advanced Concepts; 4 Visualization; 4.1 Matrices of Contour Plots; 4.2 Nested Dimensions; Reference; 5 Constraints; 5.1 Satisfaction of Constraints by Construction; 5.2 Penalty Functions; 5.3 Example Constrained Problem; 5.3.1 Using a Kriging Model of the Constraint Function; 5.3.2 Using a Kriging Model of the Objective Function; 5.4 Expected Improvement Based Approaches
5.4.1 Expected Improvement With Simple Penalty Function; 5.4.2 Constrained Expected Improvement; 5.5 Missing Data; 5.5.1 Imputing Data for Infeasible Designs; 5.6 Design of a Helical Compression Spring Using Constrained Expected Improvement; 5.7 Summary; References; 6 Infill Criteria with Noisy Data; 6.1 Regressing Kriging; 6.2 Searching the Regression Model; 6.2.1 Re-Interpolation; 6.2.2 Re-Interpolation With Conditional Likelihood Approaches; 6.3 A Note on Matrix Ill-Conditioning; 6.4 Summary; References; 7 Exploiting Gradient Information; 7.1 Obtaining Gradients; 7.1.1 Finite Differencing
7.1.2 Complex Step Approximation

Sommario/riassunto

Surrogate models expedite the search for promising designs by standing in for expensive design evaluations or simulations. They provide a global model of some metric of a design (such as weight, aerodynamic drag, cost, etc.), which can then be optimized efficiently. Engineering Design via Surrogate Modelling is a self-contained guide to surrogate models and their use in engineering design. The fundamentals of building, selecting, validating, searching and refining a surrogate are presented in a manner accessible to novices in the field. Figures are used liberally to explain the key

2. Record Nr.	UNINA9910830655303321
Autore	Schwarz Tobias
Titolo	Veterinary Computed Tomography [[electronic resource]]
Pubbl/distr/stampa	Hoboken, : Wiley, 2011
ISBN	1-118-78567-3 1-283-27289-X 0-470-96012-4 9786613272898
Descrizione fisica	1 online resource (1359 p.)
Altri autori (Persone)	SaundersJimmy
Disciplina	636.089/60757 636.08960757
Soggetti	Veterinary tomography Veterinary tomography - Digital techniques Radiography, Medical Tomography, X-Ray Image Interpretation, Computer-Assisted Radiographic Image Enhancement Guideline Image Enhancement Publication Formats Radiography Tomography Diagnostic Imaging Publication Characteristics Diagnostic Techniques and Procedures Photography Diagnosis Analytical, Diagnostic and Therapeutic Techniques and Equipment Practice Guideline Tomography, X-Ray Computed Health & Biological Sciences Veterinary Medicine
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

Note generali

Description based upon print version of record.

Nota di contenuto

Cover; Title page; Copyright page; Contributors; Preface; Acknowledgements; Basic CT Unit Anatomy; X-Ray Tube; Collimators and Filtration; Detector Systems; Gantry Anatomy; Scanning Modes; Table Design; Proprietary CT Terminology; CHAPTER ONE: CT Physics and Instrumentation - Mechanical Design; Image Parameter Selection; Patient Set-Up; Patient Restraint; CHAPTER TWO: CT Acquisition Principles; Basic CT Descriptive Terminology; Image Labels; Tomographic Reconstruction: CT Numbers or Hounsfield Units; Digital Image Display: Windowing Techniques
CHAPTER THREE: Principles of CT Image Interpretation Introduction; Geometrical Errors; Algorithm Distortions; Attenuation Measurement-Induced Artifacts; Energy Spectrum Effects; Conclusions; CHAPTER FOUR: Artifacts in CT; Intravenous Contrast Medium Administration; Equine Intra-Arterial Contrast Administration; Contrast Administration Method: Manual Versus Power Injector; Other Contrast Media Applications; CHAPTER FIVE: CT Contrast Media and Applications; Densitometry; Automated Bolus Tracking; CT Perfusion Imaging; Multiplanar Reconstruction; Curvilinear Reconstruction
Paddle Wheel Reconstruction 3D Reconstruction; CHAPTER SIX: Special Software Applications; Picture Archive and Communication Systems; DICOM; RIS/HIS; Transfer Speed; Non-Proprietary Workstations; CHAPTER SEVEN: Digital Environment; Introduction; Principles of External Beam Radiotherapy; Principles of Radiotherapy Treatment Planning; Reducing Set-Up Errors; Summary; CHAPTER EIGHT: CT Planning for Radiotherapy; Introduction; CT for Biopsy Procedures; CT Monitoring of Stents and Other Devices; CT Assisted Embolization Techniques; CT-Monitored Cryoablation of Tumors; Interventional CT in Equines
CHAPTER NINE: Interventional CT Business Plan: Income versus Expenses, i.e. Profit or Loss; Service Contract: All, Some or Nothing at All; Caseload Considerations: Fixed and Variable Costs of Doing Business; CHAPTER TEN: Purchase Considerations; Imaging Protocol; CT: Anatomy and Normal Variants; Disease Features; CHAPTER ELEVEN: Nasal Cavities and Frontal Sinuses; Imaging Protocol; CT: Anatomy and Normal Variants; Non-Dental Diseases; Dental Diseases; CHAPTER TWELVE: Oral Cavity, Mandible, Maxilla and Dental Apparatus; Imaging Protocol; CT: Anatomy and Normal Variants; Disease Features
CHAPTER THIRTEEN: Temporomandibular Joint and Masticatory Apparatus Imaging Protocol; The Orbita; The Salivary Glands; Lacrimal System; CHAPTER FOURTEEN: Orbita, Salivary Glands and Lacrimal System; Imaging Protocol; CT: Anatomy and Normal Variants; CT Disease Features; CHAPTER FIFTEEN: External, Middle and Inner Ear; Imaging Protocol; CT: Anatomy and Normal Variants; CT Disease Features; CHAPTER SIXTEEN: Calvarium and Zygomatic Arch; Imaging Protocol; CT: Anatomy and Normal Variants; Disease Features; CHAPTER SEVENTEEN: Lymph Nodes of Head and Neck; Imaging Protocol
CT: Anatomy and Normal Variants

Sommario/riassunto

This practical and highly illustrated guide is an essential resource for veterinarians seeking to improve their understanding and use of computed tomography (CT) in practice. It provides a thorough grounding in CT technology, describing the underlying physical principles as well as the different types of scanners. The book also includes principles of CT examination such as guidance on positioning and how to achieve a good image quality. Written by specialists from

twelve countries, this book offers a broad range of expertise in
veterinary computed tomography, and is the first book to des
