An Introduction to Malware

These notes, intended for use in DTU course 02233 on Network Security, give a short introduction to the topic of malware. The most important types of malware are described, together with their basic principles of operation and dissemination, and defenses against malware are discussed.

Introduction to Statistics - eNotes

Online textbook used in the introductory statistics courses at DTU. It provides a basic introduction to applied statistics for engineers. The necessary elements from probability theory are introduced (stochastic variable, density and distribution function, mean and variance, etc.) and thereafter the most basic statistical analysis methods are presented: Confidence band, hypothesis testing, simulation, simple and multiple regression, ANOVA and analysis of contingency tables. Examples with the software R are included for all presented theory and methods.

Differentialligninger og uendelige rækker
Dengang jorden var flad - Dengang jorden var blommen i et æg

Introduction to Medical Image Analysis
This book is a result of a collaboration between DTU Informatics at the Technical University of Denmark and the Laboratory of Computer Vision and Media Technology at Aalborg University. It is partly based on the book "Image and Video Processing", second edition by Thomas Moeslund. The aim of the book is to present the fascinating world of medical image analysis in an easy and interesting way. Compared to many standard books on image analysis, the approach we have chosen is less mathematical and more casual. Some of the key algorithms are exemplified in C-code. Please note that the code is neither optimal nor complete and merely serves as an additional input for comprehending the algorithms. It is no secret that this book is written by two authors. The keen reader will therefore note changes in style and language throughout the text.

Security of Dependable Systems
Security and dependability are crucial for designing trustworthy systems. The approach "security as an add-on" is not satisfactory, yet the integration of security in the development process is still an open problem. Especially, a common framework for specifying dependability and security is very much needed. There are many pressing challenges however; here, we address some of them. Firstly, security for dependable systems is a broad concept and traditional view of security, e.g., in terms of confidentiality, integrity and availability, does not suffice. Secondly, a clear definition of security in the dependability context is not agreed upon. Thirdly, security attacks cannot be modeled as a stochastic process, because the adversary's strategy is often carefully planned. In this chapter, we explore these challenges and provide some directions toward their solutions.

General information
State: Published
Organisations: Image Analysis and Computer Graphics, Department of Informatics and Mathematical Modeling, Aalborg University
Authors: Paulsen, R. R. (Intern), Moeslund, T. B. (Ekstern)
Number of pages: 186
Publication date: 2011

Publication information
Place of publication: Kgs. Lyngby
Edition: 1
ISBN (Print): 978-87-643-0785-6
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 316158
Publication: Education › Book – Annual report year: 2011

Security of Dependable Systems
Security and dependability are crucial for designing trustworthy systems. The approach “security as an add-on” is not satisfactory, yet the integration of security in the development process is still an open problem. Especially, a common framework for specifying dependability and security is very much needed. There are many pressing challenges however; here, we address some of them. Firstly, security for dependable systems is a broad concept and traditional view of security, e.g., in terms of confidentiality, integrity and availability, does not suffice. Secondly, a clear definition of security in the dependability context is not agreed upon. Thirdly, security attacks cannot be modeled as a stochastic process, because the adversary’s strategy is often carefully planned. In this chapter, we explore these challenges and provide some directions toward their solutions.

General information
State: Published
Organisations: Embedded Systems Engineering, Department of Informatics and Mathematical Modeling
Authors: Ahmed, N. (Intern), Jensen, C. D. (Intern)
Pages: 230-264
Publication date: 2011
Integration i flere variable

Lecture Notes on Real-Time Graphics

Numerical Solution of Ordinary Differential Equations: - Analysis and Applications

Pi har fødselsdag
Rundt om uendeligheden: Danskernes Akademi, den 11. januar 2010

Brand!: Præsentation ved lancering af Matematiske Horisonter

Brand!: Simplest elliptical models of forest fire growth are discussed and illustrated.
Da de hemmelige koder blev offentlige

General information
State: Published
Organisations: Discrete mathematics, Department of Mathematics
Authors: Zenner, E. (Intern), Knudsen, L. R. (Intern)
Pages: 104-113
Publication date: 2009

Host publication information
Title of host publication: Matematiske Horisonter
Publisher: Technical University of Denmark (DTU)
ISBN (Print): 978-87-643-0453-4
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 248280
Publication: Education › Book chapter – Annual report year: 2009

Fejlrettende koder

General information
State: Published
Organisations: Discrete mathematics, Department of Mathematics
Authors: Beelen, P. (Intern), Høholdt, T. (Intern)
Number of pages: 288
Pages: 163-173
Publication date: 2009

Host publication information
Title of host publication: Matematiske Horisonter
Place of publication: Kgs. Lyngby
Publisher: Danmarks Tekniske Universitet (DTU)
ISBN (Print): 978-87-643-0453-4
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 258725
Publication: Education › Book chapter – Annual report year: 2009

Geometriske Operationer i Plan og Rum

General information
State: Published
Organisations: Geometry, Department of Mathematics
Authors: Markvorsen, S. (Intern)
Publication date: 2009
Hvorfor eliteuddannelse?

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Mathematical Statistics
Authors: Rootzen, H. (Intern), Lassen, J. K. (Intern), Landau, J. (Ekstern)
Publication date: 2009

Kvinder og matematik - vil du være med?

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling, Institute for Product Development
Authors: Rootzen, H. (Intern), Andersen, M. M. (Intern)
Pages: 140-153
Publication date: 2009

Logik, computere og kunstig intelligens

General information
State: Published
Organisations: Algorithms and Logic, Department of Informatics and Mathematical Modeling
Authors: Bolander, T. (Intern), Nilsson, J. F. (Intern), Villadsen, J. (Intern)
Pages: 218-233
Publication date: 2009
Matematik igennem millennier

General information
State: Published
Organisations: Geometry, Department of Mathematics
Authors: Hansen, V. L. (Intern)
Number of pages: 288
Publication date: 2009

Host publication information
Title of host publication: Matematiske Horisonter : Matematik i støbeskeen 1
Volume: 8-21
Place of publication: Kgs. Lyngby
Publisher: DTU Informatik og DTU Matematik
ISBN (Print): 978-87-643-0453-4
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 247221
Publication: Education - peer-review › Book chapter – Annual report year: 2009

Matematikken i computerens verden - computeren i matematikkens tjeneste

General information
State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Authors: Dammann, B. (Intern), Hansen, P. C. (Intern)
Number of pages: 288
Pages: 189-201
Publication date: 2009

Host publication information
Title of host publication: Matematiske horisonter
Publisher: Technical University of Denmark (DTU)
Editors: Hansen, C. B., Hansen, P. C., Hansen, V. L., Andersen, M. M.
ISBN (Print): 978-87-643-0453-4
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 246000
Publication: Education › Book chapter – Annual report year: 2009

Matematiske horisonter

General information
State: Published
Organisations: Institute for Product Development, Scientific Computing, Department of Informatics and Mathematical Modeling, Geometry, Department of Mathematics
Number of pages: 288
Publication date: 2009

Publication information
Place of publication: Kgs. Lyngby, Denmark
Publisher: Technical University of Denmark (DTU)
ISBN (Print): 978-87-643-0453-4
Original language: Danish
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 245996
Publication: Education › Book – Annual report year: 2009

Matematisk modellering af klima og energi

General information
The Spectral/$hp$-Finite Element Method for Partial Differential Equations

This set of lecture notes provides an elementary introduction to both the classical Finite Element Method (FEM) and the extended Spectral/$hp$-Finite Element Method for solving Partial Differential Equations (PDEs). Many problems in science and engineering can be formulated mathematically and involves one or more PDEs. The FEM is nowadays an important numerical discretization technique for approximately solving such mathematical equations on a computer. The set of lecture notes has been written for engineering students for use in the short three-week course \cite{BarkerReffstrup1998}, which is to describe the FEM in a way that supports the reader in implementing the method independently. The original set of course notes has been modified and updated and additional chapters describing the high-order extensions to form the Spectral/$hp$-Finite Element Method have been included. Thus the significant contributions of Chapters 1, 2 and 5 covering the classical Finite Element Method are in large parts due to V. A. Barker and J. Reffstrup. With this set of lecture notes it should be possible for the reader to make a Spectral/$hp$-FEM toolbox in successive steps with the support given in the text. Emphasis is on the practical details supported with basic and sufficient theory to build the foundation in a three weeks period where the tools are developed and applied immediately. Furthermore, the aim of Spectral/$hp$-FEM toolbox is to provide a simple and generic framework for developing small prototype applications rather than directly approaching large-scale models. With this in mind, the goal is to let the reader encounter the typical problems involved in the practical implementation of these models and thereby gain a fundamental understanding of the algorithms and their practical implementation. For the practical work, a number of templates described using pseudo programming code, should be understood and converted by the reader to a programming language in a concrete implementation. A number of exercises is given which in a step-by-step manner guides the reader toward developing the necessary subroutines which can be used to solve typical and fairly general PDEs in one or two spatial dimensions. In the course the chosen programming environment is Matlab, however, this is by no means a necessary requirement. The mathematical level needed to grasp the details of this set of notes requires an elementary background in mathematical analysis and linear algebra. Each chapter is supplemented with hands-on exercises and the amount of material covered is intended to be balanced in such a way that each subject amounts to approximately one weeks work including producing a small report to document and communicate the work effort. This set of lecture notes is currently a working draft and may contain some (hopefully) minor errors. Any suggestions for improving the notes or feedback on errors and the content and its structure will be highly appreciated. Please report to the email apek@imm.dtu.dk. \lsAllan P. Engsig-Karup, \today.
General information
State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Authors: Engsig-Karup, A. P. (Intern)
Publication date: 2009

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Spectral/hp-Finite Element Method
Source: orbit
Source-ID: 253758
Publication: Education › Compendium/lecture notes – Annual report year: 2009

Transition systems: Hvordan virker en colaautomat?

General information
State: Published
Organisations: Language-Based Technology, Department of Informatics and Mathematical Modeling
Authors: Pilegaard, H. (Intern), Nanz, S. (Intern), Nielson, F. (Intern), Nielson, H. R. (Intern)
Pages: 63-79
Publication date: 2009

Host publication information
Title of host publication: Matematiske Horisonter
ISBN (Print): 9788764304534
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 257276
Publication: Education - peer-review › Book chapter – Annual report year: 2009

Wavelets - forbrydernes skræk

General information
State: Published
Organisations: Applied functional analysis, Department of Mathematics
Authors: Christensen, O. (Intern)
Number of pages: 288
Pages: 81-87
Publication date: 2009

Host publication information
Title of host publication: Matematiske conditioner
Publisher: Polyteknisk Boghandel og Forlag
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 253663
Publication: Education › Book chapter – Annual report year: 2009

Active Math Learning: Presentation at CDIO Regional Nordic meeting, DTU October 21. 2008
The presentation is concerned with general course planning philosophy and a specific case study (boomerang flight geometro-dynamics) for active learning of mathematics via computer assisted and hands-on unfolding of first principles - in this case the understanding of rotations and Eulers equations for the motion of rigid bodies under controlled torques.

General information
State: Published
Organisations: Geometry, Department of Mathematics
Authors: Markvorsen, S. (Intern)
Publication date: 2008

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Curriculum research
An Introduction to Programming using MATLAB
Basic introduction to computing programming using MATLAB as first programming language.

General information
State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Authors: Rojas Larrazabal, M. D. L. C. (Intern), Dammann, B. (Intern)
Publication date: 2008

Entrance to Advanced Mathematics: The metric foundations of modern analysis

General information
State: Published
Organisations: Geometry, Department of Mathematics
Authors: Hansen, V. L. (Intern)
Number of pages: 150
Publication date: 2008

Frames and bases: An Introductory Course

General information
State: Published
Organisations: Applied functional analysis, Department of Mathematics
Authors: Christensen, O. (Intern)
Number of pages: 313
Publication date: 2008

Introduction to Optimization and Data Fitting

General information
Linear Algebra for IT & Health

General information
State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Authors: Nielsen, H. B. (Intern)
Publication date: 2008

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 224319
Publication: Education › Compendium/lecture notes – Annual report year: 2008

An Introduction to Malware
These notes intended for use in DTU course 02233 on Network Security give a short introduction to the topic of malware. The most important types of malware are described, together with their basic principles of operation and dissemination, and defences against malware are discussed.

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Computer Science and Engineering, Embedded Systems Engineering
Authors: Sharp, R. (Intern)
Publication date: 2007

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Malware, Network security
Electronic versions: malware.pdf
Design Rules and Electrical Parameters for a 90nm CMOS process
A set of fictitious simplified geometrical design rules and tables of electrical parameters are presented describing a 90nm CMOS process for educational purposes only.

Dynamics of Railway Vehicles and Rail/Wheel Contact
In these notes the fundamentals of the mechanics of rail/wheel contact and deterministic vehicle dynamics is explained. Chapter 1 describes the kinematics and dynamics of rail/wheel contact. Chapter 2 explains why vehicle dynamics must be treated as a nonlinear dynamic problem and how the model problem must be formulated. Chapters 3 and 4 deal with the theory of nonlinear parameter dependent dynamic systems in general, and chapter 5 yields the proof that the theory also applies to the high-dimensional vehicle dynamic problems. In chapter 6 the concept of non-smooth systems is introduced and some of the most important dynamic effects on vehicle dynamic problems are described. In chapter 7 characteristic features of railway vehicle dynamics are described, and in chapter 8 recommendations are presented for the numerical handling that is necessary for the investigation of vehicle dynamic problems. The notes end with a guide to vehicle system dynamics and 47 literature references.

Extracting meaning from audio signals - a machine learning approach
* Machine learning framework for sound search * Genre classification * Music and audio separation * Wind noise suppression
audio, search, sound, machine learning, signal processing

Geometri: Form og Funktion i Aktion

General information
State: Published
Organisations: Geometry, Department of Mathematics
Authors: Markvorsen, S. (Intern)
Publication date: 2007

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Boomerang geometry
Source: orbit
Source-ID: 208762
Publication: Education › Sound/Visual production (digital) – Annual report year: 2007

Geostatistics and Analysis of Spatial Data

General information
State: Published
Organisations: Image Analysis and Computer Graphics, Department of Informatics and Mathematical Modeling
Authors: Nielsen, A. A. (Intern)
Publication date: 2007

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions:
imm5177.pdf
Links:
http://www2.imm.dtu.dk/pubdb/p.php?5177
Source: orbit
Source-ID: 201123
Publication: Education › Compendium/lecture notes – Annual report year: 2007

How to keep warm by a campfire in a curved space

General information
State: Published
Organisations: Geometry, Department of Mathematics
Authors: Markvorsen, S. (Intern)
Publication date: 2007

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www.georgmohr.dk/vinderseminar.html#vins07
Source: orbit
Source-ID: 208959
Publication: Education › Sound/Visual production (digital) – Annual report year: 2007

Least Squares Adjustment: Linear and Nonlinear Weighted Regression Analysis
An Introduction to Generalized Linear Models.

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Mathematical Statistics
Authors: Thyregod, P. (Intern), Madsen, H. (Intern)
Number of pages: 239
Publication date: 2006

Publication information
Place of publication: DTU
Publisher: Informatics and Mathematical Modelling, Technical University of Denmark, DTU
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 224568
Publication: Education › Book – Annual report year: 2006

Computing the Alexander Polynomial Numerically
Explains how to construct the Alexander Matrix and how this can be used to compute the Alexander polynomial numerically.

General information
State: Published
Organisations: Department of Mathematics
Authors: Hansen, M. S. (Intern)
Publication date: 2006

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 185284
Publication: Education › Compendium/lecture notes – Annual report year: 2006

Correlation Functions and Power Spectra
The present lecture note is a supplement to the textbook Digital Signal Processing by J. Proakis and D.G. Manolakis used in the IMM/DTU course 02451 Digital Signal Processing and provides an extended discussion of correlation functions and power spectra. The definitions of correlation functions and spectra for discrete-time and continuous-time (analog) signals are pretty similar. Consequently, we confine the discussion mainly to real discrete-time signals. The Appendix contains detailed definitions and properties of correlation functions and spectra for analog as well as discrete-time signals. It is possible to define correlation functions and associated spectra for aperiodic, periodic and random signals although the interpretation is different. Moreover, we will discuss correlation functions when mixing these basic signal types. In addition, the note include several examples for the purpose of illustrating the discussed methods.

General information
State: Published
Organisations: Cognitive Systems, Department of Informatics and Mathematical Modeling
Authors: Larsen, J. (Intern)
Publication date: 2006

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions: imm4932.pdf
Links:
http://www2.imm.dtu.dk/pubdb/p.php?4932
Introduction to SPIN
In this note we introduce the SPIN model checker for verification of concurrent programs.

General information
State: Published
Organisations: Computer Science and Engineering, Department of Informatics and Mathematical Modeling
Authors: Løvengreen, H. H. (Intern)
Publication date: 2006

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 193344
Publication: Education › Compendium/lecture notes – Annual report year: 2006

ITRF, ETRS, EUREF89 og WGS84 - hvad er det nu lige det er?

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Jensen, A. B. O. (Intern)
Publication date: 2006

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 222341
Publication: Education › Compendium/lecture notes – Annual report year: 2006

Self-Avoiding Walks (SAWs), Entanglement and Biomolecules
The Self-Avoiding Walk (SAW) on a lattice are often used to study properties of polymers in good solvents such as entanglement, knotting (ring polymers), and statistical mechanical properties of polymers. Recently it has been used to explain the increased probability of phage DNA being knotted when compared to DNA in found in unconstrained environments. We propose to examine different aspects of SAWs on the square (2D) and cubic (3D) lattice using a dynamical Monte Carlo (MC) method known as the pivot algorithm. Initially we only consider linear (or open) polymers and look at the entangledness of a (lattice) polymer using the writhe of a curve. A first goal is to study the relationship between the writhe and extension of a polymer/SAW. Several questions arise naturally in the course of this project including (but not restricted to): the statistical quality of data obtained by MC sampling (autocorrelation times), how to implement geometrical (writhe) and topological (alexander polynomial) numerically, closing the curve we can start to ask questions about random (lattice) knots, optimizing the implementation e.g. using hash-coding ...

General information
State: Published
Organisations: Department of Mathematics
Authors: Hansen, M. S. (Intern)
Publication date: 2006

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 185283
Publication: Education › Compendium/lecture notes – Annual report year: 2006
Tippetoppen

General information
State: Published
Organisations: Department of Mathematics
Authors: Nordkvist, N. (Intern), Hansen, M. S. (Intern)
Publication date: 2006

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Electronic versions: tippetop.pdf
Links:
http://www.formidling.dk/sw4362.asp
Source: orbit
Source-ID: 193840
Publication: Education › Compendium/lecture notes – Annual report year: 2006

A Course in Error Correcting Codes

General information
State: Published
Organisations: Department of Photonics Engineering, Department of Mathematics
Authors: Justesen, J. (Intern), Høholdt, T. (Intern)
Number of pages: 205
Publication date: 2005

Publication information
Place of publication: Tokyo
Publisher: UNI Agency, Inc.
ISBN (Print): 4-627-81711-8
Original language: Japanese
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 182878
Publication: Education › Book – Annual report year: 2005

Classical Mechanics and Symplectic Integration

General information
State: Published
Organisations: Department of Mathematics
Authors: Nordkvist, N. (Intern), Hjorth, P. G. (Intern)
Publication date: 2005

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions: lecture_notes-1.pdf
Source: orbit
Source-ID: 193171
Publication: Education › Compendium/lecture notes – Annual report year: 2005

Integration i flere Variable

General information
State: Published
Stochastic Control - External Models
This note is devoted to control of stochastic systems described in discrete time. We are concerned with external
descriptions or transfer function model, where we have a dynamic model for the input output relation only (i.e., no direct
internal information). The methods are based on LTI systems and quadratic costs. We will start with the basic minimal
variance problem and then move on to more complex and applicable strategies such as GMV, GPC and LQG control.
These methods can be regarded as extension to the basic minimal variance strategy and have all a close relation to
prediction. Consequently a section on that topic can be found in appendix.

Test of Object-oriented Software

Electronic versions:
imm3646.pdf

Links:
http://www2.imm.dtu.dk/pubdb/p.php?3646
Source: orbit
Source-ID: 201113
Publication: Education › Compendium/lecture notes – Annual report year: 2005
Ulineære Differentialligninger

General information
State: Published
Organisations: Department of Mathematics
Authors: Hjorth, P. G. (Intern)
Pages: 57-63
Publication date: 2005

Host publication information
Title of host publication: Differentialligninger of Uendelige Rækker
Publisher: Institut for Matematik, DTU
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 186290
Publication: Education › Book chapter – Annual report year: 2005

A Course in Error-Correcting Codes

General information
State: Published
Organisations: Coding, Department of Photonics Engineering, Department of Mathematics
Authors: Justesen, J. (Intern), Høholdt, T. (Intern)
Number of pages: 194
Publication date: 2004

Publication information
Publisher: European Mathematical Society Publishing House
Edition: first
ISBN (Print): 3-03719-001-9
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 182075
Publication: Education › Book – Annual report year: 2004

Approximation Theory: From Taylor polynomials to wavelets

General information
State: Published
Organisations: Applied functional analysis, Department of Mathematics
Authors: Christensen, O. (Intern), Christensen, K. L. (Intern)
Number of pages: 156
Publication date: 2004

Publication information
Place of publication: Boston
Publisher: Birkhäuser Verlag GmbH
Edition: 3rd
ISBN (Print): 978-0-8176-3600-5, 0-8176-3600-5
Original language: English
Series: Applied Numerical Harmonic Analysis
Main Research Area: Technical/natural sciences
Source: orbit
Dynamic Optimization

Geostatistik og analyse af spatielle data

Kriging

Methods for Non-Linear Least Squares Problems (2nd ed.)
**General information**

State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Authors: Madsen, K. (Intern), Nielsen, H. B. (Intern), Tingleff, O. (Ekstern)
Publication date: 2004

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions:
imm3215.pdf
Links:
http://f
Source: orbit
Source-ID: 201120
Publication: Education › Compendium/lecture notes – Annual report year: 2004

**Optimization with Constraints, 2nd ed.**

**General information**

State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Authors: Madsen, K. (Intern), Nielsen, H. B. (Intern), Tingleff, O. (Ekstern)
Publication date: 2004

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions:
imm4213.pdf
Links:
http://www2.imm.dtu.dk/pubdb/p.php?4213
Source: orbit
Source-ID: 201119
Publication: Education › Compendium/lecture notes – Annual report year: 2004

**Statistics in Finance**

**General information**

State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling, Lund University
Authors: Madsen, H. (Intern), Nielsen, J. N. (Intern), Lindström, E. (Ekstern), Baadsgaard, M. (Intern), Holst, J. (Intern)
Number of pages: 300
Publication date: 2004

Publication information
Place of publication: Lund University
Publisher: Centre for Mathematical Sciences
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 224566
Publication: Education › Book – Annual report year: 2004

**Test of Object-oriented Software**

**General information**

State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Haxthausen, A. E. (Intern)
Publication date: 2004

Publication information
Unconstrained Optimization, 3rd edition

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Frandsen, P. E. (Ekstern), Jonasson, K. (Ekstern), Nielsen, H. B. (Intern), Tingleff, O. (Intern)
Publication date: 2004

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions: imm3217.pdf
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3217
Source: orbit
Source-ID: 201104
Publication: Education › Compendium/lecture notes – Annual report year: 2004

Dealing with Problematic Situations

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 2003

Publication information
Original language: English
Main Research Area: Technical/natural sciences
strategy, problem solving, systems thinking
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3119
Source: orbit
Source-ID: 201145
Publication: Education › Compendium/lecture notes – Annual report year: 2003

Noter (til 02701 Introduktion til Operationsanalyse)

General information
State: Published
Organisations: Operations Research, Department of Informatics and Mathematical Modeling
Authors: Juel, H. (Intern)
Publication date: 2003

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2991
Source: orbit
Source-ID: 201111
Publication: Education › Compendium/lecture notes – Annual report year: 2003
Basic Concurrency Theory
In this set of notes, we present some of the basic theory underlying the discipline of programming with concurrent processes/threads. The notes are intended to supplement a standard textbook on concurrent programming.

Creativity and Problem Solving
This note gives an introduction to the themes related to creativity, methods and applications.

Introduction to Interval Analysis

A short introduction to image analysis - Matlab exercises
This document contain a short introduction to Image analysis. In addition small exercises has been prepared in order to support the theoretical understanding.

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Hansen, M. A. E. (Intern)
Publication date: 2000

Publication information
Original language: English
Main Research Area: Technical/natural sciences
matlab, image analysis, introduction
Electronic versions:
imm626.ps
Links:
http://www2.imm.dtu.dk/pubdb/p.php?626
Source: orbit
Source-ID: 201106
Publication: Education › Compendium/lecture notes – Annual report year: 2000

Grundlæggende matematik

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science
Authors: Jensen, H. E. (Intern), Høholdt, T. (Intern)
Number of pages: 181
Publication date: 2000

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Publication: Education › Book – Annual report year: 2000

Algorithms for Linear Optimization - an Introduction

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Nielsen, H. B. (Intern)
Number of pages: 122
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions:
imm654.ps
Links:
Source: orbit
Source-ID: 170836
Publication: Education › Compendium/lecture notes – Annual report year: 1999

Introduction to Artificial Neural Networks

General information
State: Published
Organisations: Cognitive Systems, Department of Informatics and Mathematical Modeling
Authors: Larsen, J. (Intern)
Publication date: 1999
Methods for Non-Linear Least Squares Problems

General information
State: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Authors: Madsen, K. (Intern), Nielsen, H. B. (Intern), Tingleff, O. (Ekstern)
Number of pages: 56
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links: http://www2.imm.dtu.dk/pubdb/p.php?2443
Source: orbit
Source-ID: 201118
Publication: Education › Compendium/lecture notes – Annual report year: 1999

Noter (til 04030 Introduktion til Operationsanalyse)

General information
State: Published
Organisations: Operations Research, Department of Informatics and Mathematical Modeling
Authors: Juel, H. (Intern)
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 201122
Publication: Education › Compendium/lecture notes – Annual report year: 1999

Orthogonal Transformations: Lecture note

General information
State: Published
Organisations: Image Analysis and Computer Graphics, Department of Informatics and Mathematical Modeling
Authors: Nielsen, A. A. (Intern)
Number of pages: 8
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions: imm3088.pdf
The strategic process in organisations - the contribution of soft approaches

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern), Sørensen, L. (Ekstern)
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3844
Source: orbit
Source-ID: 201147
Publication: Education › Compendium/lecture notes – Annual report year: 1999

Unconstrained Optimization
This lecture note is intended for use in the course 04212 Optimization and Data Fitting at the Technical University of Denmark. It covers about 25% of the curriculum. Hopefully, the note may be useful also to interested persons not participating in that course. The aim of the note is to give an introduction to algorithms for unconstrained optimization. We present Conjugate Gradient, Damped Newton and Quasi Newton methods together with the relevant theoretical background. The reader is assumed to be familiar with algorithms for solving linear and nonlinear system of equations, at a level corresponding to an introductory course in numerical analysis. The algorithms presented in the note appear in any good program library, and implementations can be found via GAMS (Guide to Available Mathematical Software) at the Internet address http://gams.nist.gov The examples in the note were computed in Matlab. The programs are available via http://www.imm.dtu.dk/hbn/software.html

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Frandsen, P. E. (Ekstern), Jonasson, K. (Ekstern), Nielsen, H. B. (Intern), Tingleff, O. (Intern)
Publication date: 1999

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:

Bibliographical note
Available in ps or in pdf format.
Source: orbit
Source-ID: 201105
Publication: Education › Compendium/lecture notes – Annual report year: 1999

Cubic Splines

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Nielsen, H. B. (Intern)
Number of pages: 80
Publication date: 1998

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions:
imm655.ps
Noter (til 04030 Introduktion til Operationsanalyse)

General information
State: Published
Organisations: Operations Research, Department of Informatics and Mathematical Modeling
Authors: Juel, H. (Intern)
Publication date: 1998

Publication information
Original language: English
Links:
http://www2.imm.dtu.dk/pubdb/p.php?369
Source: orbit
Source-ID: 201115
Publication: Education › Compendium/lecture notes – Annual report year: 1998

Statistics in Finance

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Madsen, H. (Intern), Nielsen, J. N. (Intern), Baadsgaard, M. (Intern)
Number of pages: 336
Publication date: 1998

Publication information
Place of publication: DTU
Publisher: Informatics and Mathematical Modelling, Technical University of Denmark, DTU
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 224565
Publication: Education › Book – Annual report year: 1998

Compilation of lecture notes for "Summer School on Asynchronous Circuit Design", DTU, August 18-22

General information
State: Published
Organisations: Computer Science and Engineering, Department of Informatics and Mathematical Modeling
Authors: Sparsø, J. (Intern)
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?4537
Source: orbit
Source-ID: 201143
Publication: Education › Compendium/lecture notes – Annual report year: 1997

Direct Methods for Sparse Matrices: An Introduction

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Planlægning og OR

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Number of pages: 210
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3788
Source: orbit
Source-ID: 175664
Publication: Education › Compendium/lecture notes – Annual report year: 1997

Stokastisk adaptiv regulering - Adaptive Systemer

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Poulsen, N. K. (Intern)
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2719
Source: orbit
Source-ID: 201138
Publication: Education › Compendium/lecture notes – Annual report year: 1997

Stokastisk adaptiv regulering - Appendix

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Poulsen, N. K. (Intern)
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2720
Stokastisk adaptiv regulering - Basis

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Poulsen, N. K. (Intern)
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2716
Source: orbit
Source-ID: 201139
Publication: Education › Compendium/lecture notes – Annual report year: 1997

Stokastisk adaptiv regulering - Stokastiske Systemer, filtrering og regulering

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Poulsen, N. K. (Intern)
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2717
Source: orbit
Source-ID: 201135
Publication: Education › Compendium/lecture notes – Annual report year: 1997

Stokastisk adaptiv regulering - System identifikation

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Poulsen, N. K. (Intern)
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2718
Source: orbit
Source-ID: 201136
Publication: Education › Compendium/lecture notes – Annual report year: 1997

Introduktion til MATLAB ved IMM's kurser

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Hansen, L. H. (Intern), Nielsen, H. B. (Intern)
Publication date: 1996

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2719
Source: orbit
Source-ID: 201140
Publication: Education › Compendium/lecture notes – Annual report year: 1997
Temporale forhold i synkrone integrerede kredsløb med 2-fase klok

General information
State: Published
Organisations: Computer Science and Engineering, Department of Informatics and Mathematical Modeling
Authors: Sparsø, J. (Intern)
Publication date: 1994

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?4544
Source: orbit
Source-ID: 201144
Publication: Education › Compendium/lecture notes – Annual report year: 1994

A short introduction to Matlab

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Poulsen, N. K. (Intern)
Publication date: 1993

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2770
Source: orbit
Source-ID: 201140
Publication: Education › Compendium/lecture notes – Annual report year: 1993

LaTeX noter

General information
State: Published
Organisations: Operations Research, Department of Informatics and Mathematical Modeling
Authors: Juel, H. (Intern)
Publication date: 1993

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 202514
Publication: Education › Compendium/lecture notes – Annual report year: 1993

Numeriske Metoder for Sædvanlige Differentialligninger

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Nielsen, H. B. (Intern), Thomsen, P. G. (Intern)
Publication date: 1993

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?675
Numerisk Integration

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Busk, T. (Ekstern), Nielsen, H. B. (Ekstern)
Publication date: 1993

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?674
Source: orbit
Source-ID: 201101
Publication: Education › Compendium/lecture notes – Annual report year: 1993

Planlægning og OR

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1993

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3785
Source: orbit
Source-ID: 201151
Publication: Education › Compendium/lecture notes – Annual report year: 1993

Introduktion til LaTeX på IMSOR

General information
State: Published
Organisations: Operations Research, Department of Informatics and Mathematical Modeling
Authors: Juel, H. (Intern)
Publication date: 1992

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 202516
Publication: Education › Compendium/lecture notes – Annual report year: 1992

Practice problems (for 0403 Introduction to Operations Research)

General information
State: Published
Organisations: Operations Research, Department of Informatics and Mathematical Modeling
Authors: Juel, H. (Intern)
Publication date: 1992

Publication information
Original language: English
Introduktion til simulationssystemet (ACSL)

General information
State: Published
Organisations: Mathematical Statistics, Department of Informatics and Mathematical Modeling
Authors: Poulsen, N. K. (Intern)
Publication date: 1991

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?370
Source: orbit
Source-ID: 201116
Publication: Education › Compendium/lecture notes – Annual report year: 1992

Øvelser i Statistisk Billedbehandling

General information
State: Published
Organisations: Image Analysis and Computer Graphics, Department of Informatics and Mathematical Modeling
Authors: Carstensen, J. M. (Intern)
Number of pages: 28
Publication date: 1991

Publication information
Publisher: Institute of Mathematical Statistics and Operations Research, Technical University of Denmark
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?2768
Source: orbit
Source-ID: 201141
Publication: Education › Compendium/lecture notes – Annual report year: 1991

Struktureret konstruktion af digitale ASIC’s

General information
State: Published
Organisations: Computer Science and Engineering, Department of Informatics and Mathematical Modeling
Authors: Pedersen, S. (Intern), Sparsø, J. (Intern)
Publication date: 1991

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?991
Source: orbit
Source-ID: 200562
Publication: Education › Compendium/lecture notes – Annual report year: 1991

Konstruktion af indlæseprogrammer
General information
State: Published
Organisations: Software Engineering, Department of Informatics and Mathematical Modeling
Authors: Kristensen, J. T. (Intern)
Number of pages: 119
Publication date: 1990

Publication information
Place of publication: København
Publisher: Teknisk Forlag A/S
ISBN (Print): 87-571-1245-2
Original language: Danish
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235585
Publication: Education › Book – Annual report year: 1990

Statisk Optimering

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern), Ravn, H. (Ekstern)
Publication date: 1990

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3784
Source: orbit
Source-ID: 201152
Publication: Education › Compendium/lecture notes – Annual report year: 1990

Lagrange multiplicatorer - en introduktion

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1989

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3829
Source: orbit
Source-ID: 201153
Publication: Education › Compendium/lecture notes – Annual report year: 1989

Production scheduling in a steel mill

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1989

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3832
Notes on Static and Dynamic Optimization

This book pretends to be a unified presentation of the main theoretical and numerical results on optimization, and at the same time it provides an outlook to the many areas of application. It contains what I believe is the minimum knowledge required for a serious use of normative mathematical models. Most of the results presented here are available in the current literature although they are not well-known to most users of optimization methods, - what is different is the way they are presented: stepwise from general to particular results placing emphasis on the geometrical rather than the mathematical abstract approach.

General information
En introduktion til offentlig planlægning

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern), Lyngvig, J. (Ekstern)
Publication date: 1979

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3782
Source: orbit
Source-ID: 201159
Publication: Education › Compendium/lecture notes – Annual report year: 1979

Om tværfaglig undervisning i planlægning

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern), Lyngvig, J. (Ekstern)
Publication date: 1979

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3781
Source: orbit
Source-ID: 201158
Publication: Education › Compendium/lecture notes – Annual report year: 1979

Operationaanalyse - en kritik

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern), Lyngvig, J. (Ekstern)
Publication date: 1978

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3802
Source: orbit
Source-ID: 201161
Rapporter fra et undervisnings experiment i planlægning

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1978

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3780
Source: orbit
Source-ID: 201160
Publication: Education › Compendium/lecture notes – Annual report year: 1978

En introduktion til Everett's teori og dens anvendelser

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern), Ravn, H. V. (Intern)
Publication date: 1977

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3779
Source: orbit
Source-ID: 201162
Publication: Education › Compendium/lecture notes – Annual report year: 1977

A tutorial on planning

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1975

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3778
Source: orbit
Source-ID: 201163
Publication: Education › Compendium/lecture notes – Annual report year: 1975

Nonlinear Programming

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1974

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3776
Source: orbit
Source-ID: 201164
Publication: Education › Compendium/lecture notes – Annual report year: 1974

**Principles of OR**

**General information**
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1974

**Publication information**
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3794
Source: orbit
Source-ID: 201165
Publication: Education › Compendium/lecture notes – Annual report year: 1974

**Relaxation and Bender's partitioning algorithm**

**General information**
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Authors: Vidal, R. V. V. (Intern)
Publication date: 1973

**Publication information**
Original language: English
Main Research Area: Technical/natural sciences
Links:
http://www2.imm.dtu.dk/pubdb/p.php?3775
Source: orbit
Source-ID: 201166
Publication: Education › Compendium/lecture notes – Annual report year: 1974

**Algol W Fejlmeldinger: Med 113 programeksempler**

**General information**
State: Published
Organisations: Software Engineering, Department of Informatics and Mathematical Modeling
Authors: Kristensen, J. T. (Intern)
Number of pages: 90
Publication date: 1971

**Publication information**
Place of publication: København
Publisher: Akademisk Forlag
ISBN (Print): 87 500 1197 9
Original language: Danish
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 235532
Publication: Education › Book – Annual report year: 1971

**Algol W Programmering**

**General information**