Solution And Estimation Methods For Dsge Models

This dissertation, "Robust Estimation Methods for Image Matching" by Chunlin, Feng, ???, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. Abstract: Abstract of Thesis Entitled Robust Estimation Methods for Image Matching Submitted by FENG Chun Lin for the degree of Master of Philosophy at The University of Hong Kong in August 2004 This study proposes new image matching methods for matching feature points across a pair or triple of views through robust recovery of epipolar geometry or trifocal geometry. The aim of this study was to enable 3D scenes to be automatically reconstructed using projective geometry, assuming corresponding points are matched robustly using the methods proposed in the thesis. Its findings have applications to 3D reconstruction, robust estimation and object recognition. Image matching, i.e. depicting the process of recovering feature correspondences, is a challenging problem in computer vision. The crux of this problem is that putative matches are often poorly or incorrectly extracted by intensity-based cross-correlation methods. Geometry-based methods, inspired by geometric relationships governing point correspondences, are therefore used to examine the correctness of correspondence of putative matches. However, retrieving geometric relationships can be difficult in the presence of a fair proportion of mismatches. For this reason, the fundamental matrix for epipolar geometry or trifocal tensor in the case of trifocal geometry may well be

incorrectly estimated due to misclassification of matches and mismatches. In order to overcome this problem, two methods are proposed in this study for matching two-view and three-view images, both involving intensity-based and geometry-base matching. Intensity-based matching forms putative matches based on image intensity, which involves corner detection and cross-correlation measurement. Geometry-based matching examines the correctness of correspondences of putative matches in a geometric perspective, thus enabling correct matches to be distinguished from mismatches. This method first determines the fundamental matrix or trifocal tensor from random samples, and then evaluates each solution through reprojection error measurement, parameter estimation, dataset classification and scoring, and finally yields the solution with the best score together with associated matches. The matching methods proposed in this study include: (a) incorporation of a maximum likelihood estimator for unknown parameters in the image error model, thus removing complexity arising from manual configuration of these parameters; (b) formulation of an effective cost function to score each solution by considering its consistency with estimated matches and the shape of its residual error distribution, thus enabling a fair measurement of solution error; and (c) determination and evaluation of solutions (the fundamental matrix for two views and the trifocal tensor for three views) by means of the same measure viz. the geometric error. The novelty of the proposed methods mainly lies in the study in part (a) and (b), and in the integration of the characteristics (a)-(c) into a single algorithm. Extensive evaluations are performed for both synthetic and real image sequences to validate the proposed methods. This study also includes a novel investigation of random sampling strategy to determine the optimal size for random sampling in the fundamental matrix estimation, thereby improving the

computational efficiency of linear estimators. DOI: 10.5353/th_b2975269

This book gives a practical, applications-oriented account of the latest techniques for estimating and analyzing large, nonlinear macroeconomic models. Ray Fair demonstrates the application of these techniques in a detailed presentation of several actual models, including his United States model, his multicountry model, Sargent's classical macroeconomic model, autoregressive and vector autoregressive models, and a small (twelve equation) linear structural model. He devotes a good deal of attention to the difficult and often neglected problem of moving from theoretical to econometric models. In addition, he provides an extensive discussion of optimal control techniques and methods for estimating and analyzing rational expectations models. A computer program that handles all the techniques in the book is available from the author, making it possible to use the techniques with little additional programming. The book presents the logic of this program. A smaller program for personal microcomputers for analysis of Fair's United States model is available from Urban Systems Research & Engineering, Inc. Anyone wanting to learn how to use large macroeconomic models, including researchers, graduate students, economic forecasters, and people in business and government both in the United States and abroad, will find this an essential guidebook.

Self-adaptive discretization methods are now an indispensable tool for the numerical solution of partial differential equations that arise from physical and technical applications. The aim is to obtain a numerical solution within a prescribed tolerance using a minimal amount of work. The main tools in achieving this goal are a posteriori error estimates which give global and local information on the error of the numerical solution and which can easily be computed from the

given numerical solution and the data of the differential equation. This book reviews the most frequently used a posteriori error estimation techniques and applies them to a broad class of linear and nonlinear elliptic and parabolic equations. Although there are various approaches to adaptivity and a posteriori error estimation, they are all based on a few common principles. The main aim of the book is to elaborate these basic principles and to give guidelines for developing adaptive schemes for new problems. Chapters 1 and 2 are quite elementary and present various error indicators and their use for mesh adaptation in the framework of a simple model problem. The basic principles are introduced using a minimal amount of notations and techniques providing a complete overview for the non-specialist. Chapters 4-6 on the other hand are more advanced and present a posteriori error estimates within a general framework using the technical tools collected in Chapter 3. Most sections close with a bibliographical remark which indicates the historical development and hints at further results.

A focused presentation of how sparse optimization methods can be used to solve optimal control and estimation problems.

Recent decades have seen a very rapid success in developing numerical methods based on explicit control over approximation errors. It may be said that nowadays a new direction is forming in numerical analysis, the main goal of which is to develop methods ofreliable computations. In general, a reliable numerical method must solve two basic problems: (a) generate a sequence of approximations that converges to a solution and (b) verify the accuracy of these approximations. A computer code for such a method must consist of two respective blocks: solver and checker. In this book, we are chiefly concerned with the problem (b) and try to present the main approaches developed for a posteriori error estimation in

various problems. The authors try to retain a rigorous mathematical style, however, proofs are constructive whenever possible and additional mathematical knowledge is presented when necessary. The book contains a number of new mathematical results and lists a posteriori error estimation methods that have been developed in the very recent time. · computable bounds of approximation errors · checking algorithms · iteration processes · finite element methods · elliptic type problems · nonlinear variational problems · variational inequalities

This book introduces the fundamental concepts of inverse heat transfer solutions and their application for solving problems in convective, conductive, radiative, and multi-physics problems. Inverse Heat Transfer: Fundamentals and Applications, Second Edition includes techniques within the Bayesian framework of statistics for solution of inverse problems. By modernizing the classic work of the late Professor M. Necat Ozisik and adding new examples and problems, this new edition provides a powerful tool for instructors, researchers, and graduate students studying thermal-fluid systems and heat transfer. FEATURES Introduces the fundamental concepts of inverse heat transfer Presents in systematic fashion the basic steps of powerful inverse solution techniques Develops inverse techniques of parameter estimation, function estimation, and state estimation Applies these inverse techniques to the solution of practical inverse heat transfer problems Shows inverse techniques for conduction,

convection, radiation, and multi-physics phenomena Helcio R. B. Orlande is a Professor of Mechanical Engineering at the Federal University of Rio de Janeiro (UFRJ), where he was the Department Head from 2006 to 2007.

A solution method and an estimation method for nonlinear rational expectations models are presented in this paper. The solution method can be used in forecasting and policy applications and can handle models with serial correlation and multiple viewpoint dates. When applied to linear models, the solution method yields the same results as those obtained from currently available methods that are designed specifically for linear models. It is, however, more flexible and general than these methods. For large nonlinear models the results in this paper indicate that the method works quite well. The estimation method is based on the maximum likelihood principal. It is, as far as we know, the only method available for obtaining maximum likelihood estimates for nonlinear rational expectations models. The method has the advantage of being applicable to a wide range of models, including, as a special case, linear , models. The method can also handle different assumptions about the expectations of the exogenous variables, something which is not true of currently available approaches to linear models.

"Estimating the integer parameter vector in a linear model with additive Gaussian noisearises from many applications, including communications, control, and

global navigationsatellite systems. For an overdetermined integer linear model, the optimal method is tosolve an integer least squares (ILS) problem, which is unfortunately NP-hard; and a suboptimalmethod often used in applications which needs a fast solution is Babai's method.Unfortunately the performance of the Babai estimator can be much worse than that of the ILSestimator. This thesis proposes two new estimation methods and analyzes the performanceof the two estimators. The two proposed methods are between the ILS method and Babai'smethod in terms of time complexity and estimation quality. Simulation results show thatthese two methods can be much more efficient than the ILS method, while the quality ofthe two estimators can be much better than that of the Babai estimator. In addition, thethesis analyzes the performance of the randomized Babai estimator and some interesting anduseful theoretical results are obtained"--

In a conversational tone, Regression & Linear Modeling provides conceptual, user-friendly coverage of the generalized linear model (GLM). Readers will become familiar with applications of ordinary least squares (OLS) regression, binary and multinomial logistic regression, ordinal regression, Poisson regression, and loglinear models. The author returns to certain themes throughout the text, such as testing assumptions, examining data quality, and,

where appropriate, nonlinear and non-additive effects modeled within different types of linear models. Available with Perusall—an eBook that makes it easier to prepare for class Perusall is an award-winning eBook platform featuring social annotation tools that allow students and instructors to collaboratively mark up and discuss their SAGE textbook. Backed by research and supported by technological innovations developed at Harvard University, this process of learning through collaborative annotation keeps your students engaged and makes teaching easier and more effective. Learn more.

This estimation reference text thoroughly describes matrix factorization methods successfully employed by numerical analysts, familiarizing readers with the techniques that lead to efficient, economical, reliable, and flexible estimation algorithms. Topics include a review of least squares data processing and the Kalman filter algorithm; positive definite matrices, the Cholesky decomposition, and some of their applications; Householder orthogonal transformations; sequential square root data processing; mapping effects and process noise; biases and correlated process noise; and covariance analysis of effects due to mismodeled variables and incorrect filter a priori statistics. The concluding chapters explore SRIF error analysis of effects due to mismodeled variables and incorrect filter a priori statistics as well as square root information smoothing.

Geared toward advanced undergraduates and graduate students, this pragmatically oriented and detailed presentation is also a useful reference, featuring numerous helpful appendixes throughout the text.

It was R. Frisch, who in his publications 'Correlation and Scatter Analysis in Statistical Variables' (1929) and 'Statistical Confluence Analysis by means of Complete Regression Systems' (1934) first pointed out the complications that arise if one applies regression analysis to variables among which several independent linear relations exist. Should these relationships be exact, then there exist two closely related solutions for this problem, viz. 1. The estimation of 'stable' linear combinations of coefficients, the so-called estimable functions. 2. The dropping of the wen-known condition of unbiasedness of the estimators. This leads to minimum variance minimum bias estimators. This last solution is generalised in this book for the case of a model consisting of several equations. In econometrics however, the relations among variables are nearly always approximately linear so that one cannot apply one of the solutions mentioned above, because in that case the matrices used in these methods are, although ill-conditioned, always of full rank. Approximating these matrices by good-conditioned ones of the desired rank, it is possible to apply these estimation methods. In order to get an insight in the consequences of this approximation a simulation study has been carried out for a two-equation model. Two Stage Least Squares estimators and estimators found with the aid of the above mentioned estimation method have been compared. The results of this study seem to be favourable for this new method.

"Provides a step-by-step introduction to the need for cost estimation, the various applications,

and the available resources for obtaining relevant data"--
Solution and Estimation Methods for DSGE ModelsSolution and Estimation Methods for DSGE ModelsSolution and Estimation Methods for DSGE ModelsNonlinear EstimationMethods and Applications with Deterministic Sample PointsCRC Press
Nonlinear Estimation: Methods and Applications with Deterministic Sample Points focusses on a comprehensive treatment of deterministic sample point filters (also called Gaussian filters) and their variants for nonlinear estimation problems, for which no closed-form solution is available in general. Gaussian filters are becoming popular with the designers due to their ease of implementation and real time execution even on inexpensive or legacy hardware. The main purpose of the book is to educate the reader about a variety of available nonlinear estimation methods so that the reader can choose the right method for a real life problem, adapt or modify it where necessary and implement it. The book can also serve as a core graduate text for a course on state estimation. The book starts from the basic conceptual solution of a nonlinear estimation problem and provides an in depth coverage of (i) various Gaussian filters such as the unscented Kalman filter, cubature and quadrature based filters, Gauss-Hermite filter and their variants and (ii) Gaussian sum filter, in both discrete and continuous-discrete domain. Further, a brief description of filters for randomly delayed measurement and two case-studies are also included. Features: The book covers all the important Gaussian filters, including filters with randomly delayed measurements. Numerical simulation examples with detailed matlab code are provided for most algorithms so that beginners can verify their understanding. Two real world case studies are included: (i) underwater passive target tracking, (ii) ballistic target tracking. The style of writing is suitable

for engineers and scientists. The material of the book is presented with the emphasis on key ideas, underlying assumptions, algorithms, and properties. The book combines rigorous mathematical treatment with matlab code, algorithm listings, flow charts and detailed case studies to deepen understanding.

The thesis examines three methods for calculating the 100(1-alpha)% lower confidence limits for the reliability of a K-sized series system. Assuming that each component reliability has a Beta distribution, identical posterior parameters A and B are assigned for each component. (Author).

The central focus of this book is the control of continuous-time/continuous-space nonlinear systems. Using new techniques that employ the max-plus algebra, the author addresses several classes of nonlinear control problems, including nonlinear optimal control problems and nonlinear robust/H-infinity control and estimation problems. Several numerical techniques are employed, including a max-plus eigenvector approach and an approach that avoids the curse-of-dimensionality. The max-plus-based methods examined in this work belong to an entirely new class of numerical methods for the solution of nonlinear control problems and their associated Hamilton–Jacobi–Bellman (HJB) PDEs; these methods are not equivalent to either of the more commonly used finite element or characteristic approaches. Max-Plus Methods for Nonlinear Control and Estimation will be of interest to applied mathematicians, engineers, and graduate students interested in the control of nonlinear systems through the implementation of recently developed numerical methods.

This unique volume introduces and discusses the methods of validating computer simulations in scientific research. The core concepts, strategies, and techniques of validation are explained

by an international team of pre-eminent authorities, drawing on expertise from various fields ranging from engineering and the physical sciences to the social sciences and history. The work also offers new and original philosophical perspectives on the validation of simulations. Topics and features: introduces the fundamental concepts and principles related to the validation of computer simulations, and examines philosophical frameworks for thinking about validation; provides an overview of the various strategies and techniques available for validating simulations, as well as the preparatory steps that have to be taken prior to validation; describes commonly used reference points and mathematical frameworks applicable to simulation validation; reviews the legal prescriptions, and the administrative and procedural activities related to simulation validation; presents examples of best practice that demonstrate how methods of validation are applied in various disciplines and with different types of simulation models; covers important practical challenges faced by simulation scientists when applying validation methods and techniques; offers a selection of general philosophical reflections that explore the significance of validation from a broader perspective. This truly interdisciplinary handbook will appeal to a broad audience, from professional scientists spanning all natural and social sciences, to young scholars new to research with computer simulations. Philosophers of science, and methodologists seeking to increase their understanding of simulation validation, will also find much to benefit from in the text.
Software effort estimation is one of the oldest and most important problems in software project management, and thus today there are a large number of models, each with its own unique strengths and weaknesses in general, and even more importantly, in relation to the environment and context in which it is to be applied. Trendowicz and Jeffery present a

comprehensive look at the principles of software effort estimation and support software practitioners in systematically selecting and applying the most suitable effort estimation approach. Their book not only presents what approach to take and how to apply and improve it, but also explains why certain approaches should be used in specific project situations. Moreover, it explains popular estimation methods, summarizes estimation best-practices, and provides guidelines for continuously improving estimation capability. Additionally, the book offers invaluable insights into project management in general, discussing issues including project trade-offs, risk assessment, and organizational learning. Overall, the authors deliver an essential reference work for software practitioners responsible for software effort estimation and planning in their daily work and who want to improve their estimation skills. At the same time, for lecturers and students the book can serve as the basis of a course in software processes, software estimation, or project management.

This 1994 two-volume set of articles reflects the state of research in theoretical and applied econometrics. The topics covered include time series methods, semiparametric methods, seasonality, financial economics, model solution techniques, economic development and labour economics.

The Oxford Handbook of Quantitative Methods in Psychology provides an accessible and comprehensive review of the current state-of-the-science and a one-stop source for learning and reviewing current best-practices in a quantitative methods across the social, behavioral, and educational sciences.

As computational fluid dynamics (CFD) is applied to ever more demanding fluid flow problems, the ability to compute numerical fluid flow solutions to a user specified tolerance as well as the

ability to quantify the accuracy of an existing numerical solution are seen as essential ingredients in robust numerical simulation. Although the task of accurate error estimation for the nonlinear equations of CFD seems a daunting problem, considerable effort has centered on this challenge in recent years with notable progress being made by the use of advanced error estimation techniques and adaptive discretization methods. To address this important topic, a special course wasjointly organized by the NATO Research and Technology Office (RTO), the von Karman Insti tute for Fluid Dynamics, and the NASA Ames Research Center. The NATO RTO sponsored course entitled "Error Estimation and Solution Adaptive Discretization in CFD" was held September 10-14, 2002 at the NASA Ames Research Center and October 15-19, 2002 at the von Karman Institute in Belgium. During the special course, a series of comprehensive lectures by leading experts discussed recent advances and technical progress in the area of numerical error estimation and adaptive discretization methods with spe cific emphasis on computational fluid dynamics. The lecture notes provided in this volume are derived from the special course material. The volume con sists of 6 articles prepared by the special course lecturers.

Over the last decade, the usage of unmanned systems such as Unmanned Aerial Vehicles (UAVs), Unmanned Surface Vessels (USVs) and Unmanned Ground Vehicles (UGVs) has increased drastically, and there is still a rapid growth. Today, unmanned systems are being deployed in many daily operations, e.g. for deliveries in remote areas, to increase efficiency of agriculture, and for environmental monitoring at sea. For safety reasons, unmanned systems are often the preferred choice for surveillance missions in hazardous environments, e.g. for detection of nuclear radiation, and in disaster areas after earthquakes, hurricanes, or during

forest fires. For safe navigation of the unmanned systems during their missions, continuous and accurate global localization and attitude estimation is mandatory. Over the years, many vision-based methods for position estimation have been developed, primarily for urban areas. In contrast, this thesis is mainly focused on vision-based methods for accurate position and attitude estimates in natural environments, i.e. beyond the urban areas. Vision-based methods possess several characteristics that make them appealing as global position and attitude sensors. First, vision sensors can be realized and tailored for most unmanned vehicle applications. Second, geo-referenced terrain models can be generated worldwide from satellite imagery and can be stored onboard the vehicles. In natural environments, where the availability of geo-referenced images in general is low, registration of image information with terrain models is the natural choice for position and attitude estimation. This is the problem area that I addressed in the contributions of this thesis. The first contribution is a method for full 6DoF (degrees of freedom) pose estimation from aerial images. A dense local height map is computed using structure from motion. The global pose is inferred from the 3D similarity transform between the local height map and a digital elevation model. Aligning height information is assumed to be more robust to season variations than feature-based matching. The second contribution is a method for accurate attitude (pitch and roll angle) estimation via horizon detection. It is one of only a few methods that use an omnidirectional (fisheye) camera for horizon detection in aerial images. The method is based on edge detection and a probabilistic Hough voting scheme. The method allows prior knowledge of the attitude angles to be exploited to make the initial attitude estimates more robust. The estimates are then refined through registration with the geometrically expected horizon line from a digital elevation

model. To the best of our knowledge, it is the first method where the ray refraction in the atmosphere is taken into account, which enables the highly accurate attitude estimates. The third contribution is a method for position estimation based on horizon detection in an omnidirectional panoramic image around a surface vessel. Two convolutional neural networks (CNNs) are designed and trained to estimate the camera orientation and to segment the horizon line in the image. The MOSSE correlation filter, normally used in visual object tracking, is adapted to horizon line registration with geometric data from a digital elevation model. Comprehensive field trials conducted in the archipelago demonstrate the GPS-level accuracy of the method, and that the method can be trained on images from one region and then applied to images from a previously unvisited test area. The CNNs in the third contribution apply the typical scheme of convolutions, activations, and pooling. The fourth contribution focuses on the activations and suggests a new formulation to tune and optimize a piecewise linear activation function during training of CNNs. Improved classification results from experiments when tuning the activation function led to the introduction of a new activation function, the Shifted Exponential Linear Unit (ShELU).

A complete restructuring and updating of the classic 1982 Handbook of Chemical Property Estimation Methods (commonly known as "Lyman's Handbook"), the Handbook of Property Estimation Methods for Chemicals: Environmental and Health Sciences reviews and recommends practical methods for estimating environmentally important properties of organic chemicals. One of the most eagerly anticipated revisions in scientific publishing, the new Handbook includes both a foreword and a chapter by Dr. Lyman. Written for convenient and frequent use, each chapter integrates recent developments while retaining the elements that

made the first version a classic. As a reference tool, the New Edition is indispensable. It comprehensively reviews recent developments in chemical property estimation methods and focuses on the properties most critical to environmental fate assessment.

This is a short introduction to Maximum Likelihood (ML) Estimation. It provides a general modeling framework that utilizes the tools of ML methods to outline a flexible modeling strategy that accommodates cases from the simplest linear models (such as the normal error regression model) to the most complex nonlinear models linking endogenous and exogenous variables with non-normal distributions. Using examples to illustrate the techniques of finding ML estimators and estimates, the author discusses what properties are desirable in an estimator, basic techniques for finding maximum likelihood solutions, the general form of the covariance matrix for ML estimates, the sampling distribution of ML estimators; the use of ML in the normal as well as other distributions, and some useful illustrations of likelihoods.

Our world is widely contaminated with damaging chemicals, and companies create thousands of new, potentially dangerous chemicals each year. Due to the difficulty and expense of obtaining accurate measurements and the unreliability of reported values, we know surprisingly little about the properties of these contaminants. Determining the properties of chemicals is critical to judging their impact on environmental quality and in making decisions about emission rates, clean-up, and other important public health issues. Chemical Property Estimation describes modern methods of estimating chemical properties, methods which cost much less than traditional laboratory techniques and are sufficiently accurate for most environmental applications. Estimation methods are used to screen chemicals for testing, design monitoring and analysis methods, design clean-up procedures, and verify experimental measurements.

The book discusses key methods for estimating chemical properties and considers their relative strengths and weaknesses. Several chapters are devoted to the partitioning of chemicals between air, water, soil, and biota; and properties such as solubility, vapor pressure, and chemical transport. Each chapter begins with a review of relevant theory and background information explaining the applications and limitations of each method. Sample calculations and practical advice on how and when to use each method are included as well. Each method is evaluated for accuracy and reliability. Computer software, databases, and internet resources are evaluated, as well as other supplementary material, such as fundamental constants, units of measure, and more.