Recursive Methods and Simulations in Macroeconomics

Recursive methods and their numerical application have become the most important solution methods in modern macroeconomics. The areas of their application today encompass almost all areas of macroeconomics, for example growth theory, monetary economics, social insurance, fiscal policy. Despite their widespread use in research, they have not yet become part of the standard curriculum at European economic faculties. The course aims at closing this gap. It introduces both theory and numerical application of recursive methods. The programmes are implemented in MATLAB.

Required Knowledge

Basic macro- and microeconomic theory, calculus

Target Group

Ph. D. students and postgraduates in macroeconomics as well as researchers in the financial sector

Seminar Benefits

Researchers broaden their methodological expertise and improve programming skills in MATLAB

Seminar Date and Location

March 31 to April 2, 2008, Centre for European Economic Research (ZEW) in Mannheim, Germany

Seminar Fee

The seminar fee is EUR 850,– (plus VAT).
The number of participants is limited.

Advanced Course

Simulating Tax Reforms in Dynamic Heterogeneous Agent Models

May 26-28, 2008, ZEW in Mannheim

For more information please visit our website: www.zew.de ‹‹professional training››

Seminar Organisation

In case of questions concerning the organisation of the seminar or an accommodation please contact Vera Pauli,
Telephone: 0621/1235-240, Fax 0621/1235-244, E-Mail pauli@zew.de

Programme

March 31 to April 2, 2008

Numerical Optimization

- Mathematical foundation
- Optimization algorithms in one and higher dimensions
- Newton- and Quasi-Newton algorithms
- Economic applications

Programming Workshop: Optimization

Solving Non-Linear Equations

- Mathematical foundation
- Linear equation solvers
- Newton-Algorithm
- Gauss-Jacobi and Gauss-Seidel algorithms
- Economic applications

Programming Workshop: Non-Linear Equations

Approximation

- Mathematical foundation
- Log-linearization
- Polynomial interpolation
- Approximation with orthogonal polynomials
- Spline-interpolation
- Multidimensional approximation

Programming Workshop: Approximation

Theory of Dynamics

- Deterministic and stochastic sequence problems
- Functional equations
- Contraction mapping theorem
- Bellman equation
- Envelop theorem
- Euler equation
- Economic applications

Theory Workshop: Theory of Dynamics

Simulation with the Bellman equation

- Numerical fix-point iteration
- Discrete version of Bellman equation
- Polynomial approximation of value and policy functions
- Linear regulator problem
- Economic applications

Programming Workshop: Bellman equation

Simulation with the Euler equation

- Explicit formulation of the dynamics
- Theory of projection methods
- Least square, collocation and Galerkin method
- Parameterized expectation approach
- Economic applications

Programming Workshop: Euler equation

Tutors

Dr. Alexander Ludwig

Dr. Alexander Ludwig, Mannheim Research Institute for the Economics of Aging (MEA)
Alexander Ludwig studied Economics at the Universities of Mannheim and California at Berkeley. In 2001 he began his graduate studies at the University of Mannheim, the Mannheim Research Institute for the Economics of Aging and the University Pompeu Fabra, Barcelona.
Since November 2005 he works as head of the research unit “Macroeconomis” at the MEA. He works in the following research areas: Dynamic macroeconomics, public finance, computational economics, growth and decision theoretic applications to macro questions.

Dr. Tim Mennel

Dr. Tim Mennel, Centre for European Economic Research (ZEW)
Tim Mennel studied Mathematics at the Universities Bonn and Paris VII, graduating in December 1998. After an internship he began his graduate studies of economics in October 1999 at the Bonn Graduate School of Economics (BGSE). In 2001 he visited the Graduate Program of Economics and Management of the University Pompeu Fabra (UPF), Barcelona, as a European Doctoral Programme (EDP) exchange student. At UPF and after his return to Bonn he worked in the area of dynamic principal-agent models.
In 2004 he received his PhD from BGSE with a thesis on optimal unemployment insurance. Since October 2005 he is employed at the ZEW in the research department „Environmental and Resource Economics, Environmental Management“. He works on quantitative modelling of environmental and energy policy.