

Post-Conference Workshop on Applied Computational Economics

Tentative Program

Location: Suffolk/Marriott Copley Place

Date: Wednesday, August 3, 2016

Presenters: Dmitry V. Vedenov, Texas A&M University (vedenov@tamu.edu)
Mario J. Miranda, The Ohio State University (miranda.4@osu.edu)

Workshop Schedule

7:45am	-	8:00am	Welcome/Registration	
8:00am	-	9:45am	Session 1	Linear and nonlinear equations, numerical integration and simulation
9:45am	-	10:00am	Break	Morning coffee break
10:00am	-	12:00	Session 2	Function approximation methods and intro to collocation
12:00	-	1:00pm	Break	Lunch (on your own)
1:00pm	-	2:45pm	Session 3	Dynamic programming theory, economic applications 1 (practical session)
2:45pm	-	3:00pm	Break	Coffee, tea, soft-drinks, and light snack
3:00pm	-	5:00pm	Session 4	Economic applications 2 (practical session)

Workshop Objectives

The workshop will provide an overview of the rapidly developing field of computational economics. We will focus on practical applications of numerical methods to the formulation, solution, and analysis of stochastic dynamic models in economics and finance, with emphasis on nonlinear dynamic optimization models. The workshop is based on the award-winning graduate course currently taught by Professor Miranda at The Ohio State University and will cover material presented in his textbook with Paul W. Fackler, "Applied Computational Economics and Finance", MIT Press, 2002

Workshop Outline

1. **Linear Equations**
 - L-U Factorization
 - Rounding Error
 - Ill Conditioning
2. **Nonlinear Equations**
 - Function Iteration
 - Newton's Method
 - Quasi-Newton Methods
3. **Numerical Integration and Differentiation**
 - Newton-Cotes Methods
 - Gaussian Quadrature
 - Monte Carlo Integration
 - Quasi-Monte Carlo Integration
 - Numerical Differentiation (time permitting)
4. **Function Approximation**
 - Chebychev Polynomial Interpolation
 - Cubic Spline Interpolation
 - The Collocation Method
5. **Discrete Time Dynamic Models**
 - Continuous State, Discrete Choice Models
 - Continuous State, Continuous Choice Models
 - Bellman Equation Collocation Methods
 - Implementation of Collocation Methods
 - Post-optimality Analysis