

AI-ECON Research Center

國立政治大學社會科學學院師生聯誼
暨學術發展論壇

April 19, 2000

Shu-Heng Chen, chchen@nccu.edu.tw

<http://econo.nccu.edu.tw/ai/>

AI-ECON Research Group

Department of Economics
National Chengchi University
Taipei, Taiwan

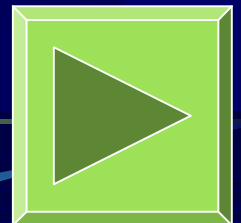
About AI-ECON

- Motivation: Why Artificial Intelligence?
- Could be other terms!
- Recent Research Topics of Interest
- Goals on Research and Education
- Future
- References

Bounded Rationality in Macroeconomics

BOUNDED
RATIONALITY IN
MACROECONOMICS

■ THOMAS J. SARGENT ■



Why Artificial Intelligence?

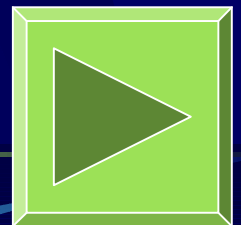
Development of Intelligent Behavior in Economic Models

- Primitive Stage
- Deductive Stage: Rational Expectations
- Inductive Stage (1): Individual Learning
- Inductive Stage (2): Social Learning



Questions from Leinweber and Arnott (1995)

- "If you had unlimited computational power, what would you do with it? (Ibid,p.11)"
- "What would you do differently if you were completely unconstrained by the capacity of your computers? (Ibid, p.9)"



Other Equivalent Terms

- **Computational Economics**
- **Evolutionary Economics**
- **Agent-Based Computational Economics**



AI-ECON Research Center: Research Topics of Interest

- Agent-Based Social Sciences
- Foundations: Evolutionary Computation



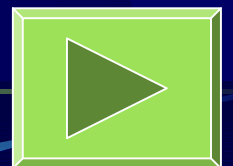
Agent-Based Social Sciences

- Books
- Websites
- Journals
- Conferences

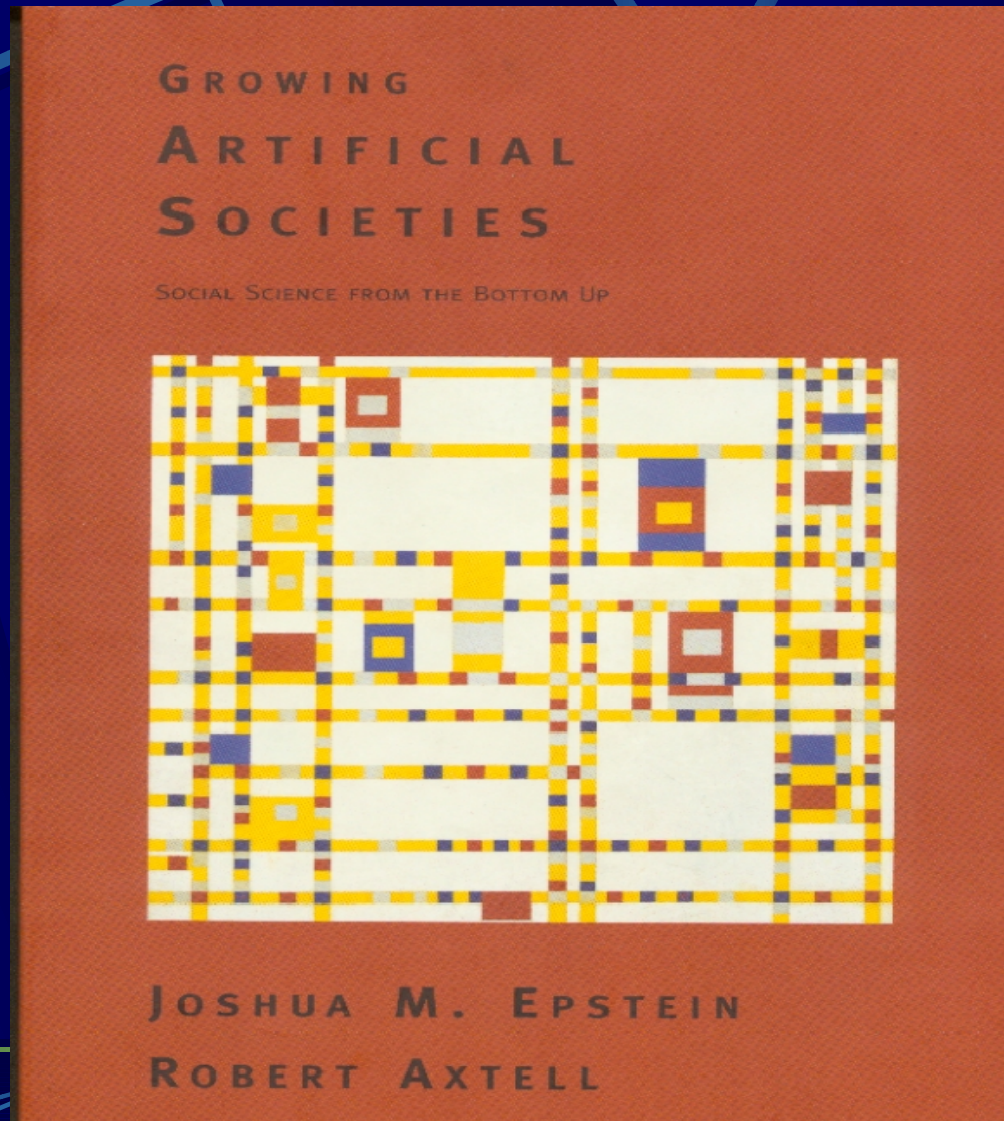


Agent-Based Social Sciences: A Starting Point

- Epstein, J. M. and R. Axtell (1996), **Growing Artificial Societies: Social Science from the Bottom Up**, The MIT Press.



Agent-Based Social Sciences: A Textbook



Agent-Based Computational Economics: The Website

Agent-Based Computational Economics (ACE)



Last Updated: 15 March 2000

Site maintained by:

[Leigh Tesfatsion](mailto:tesfatsi@iastate.edu)

Department of Economics

Iowa State University

Ames, Iowa 50011-1070

<http://www.econ.iastate.edu/tesfatsi/>



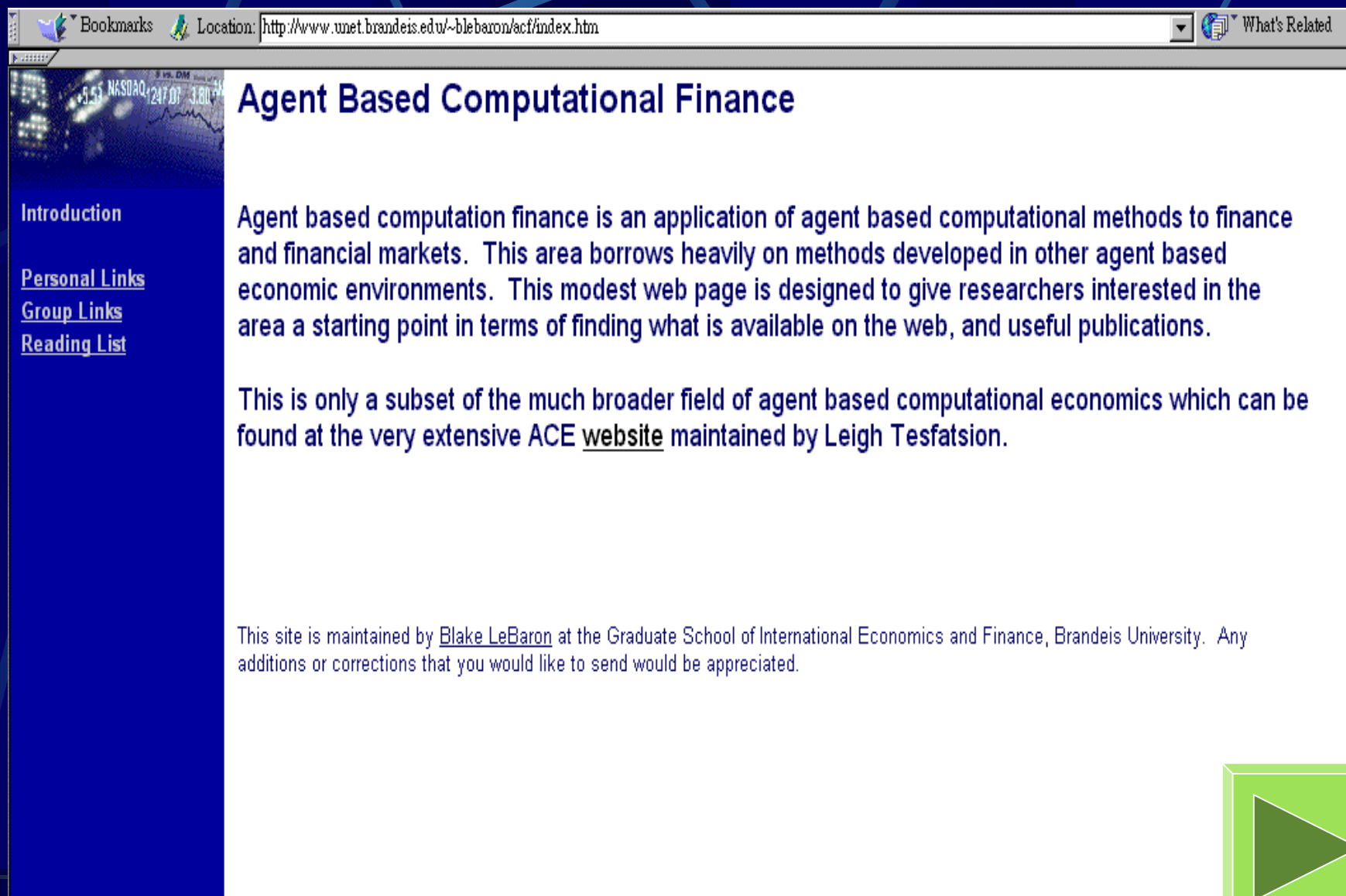
tesfatsi@iastate.edu



(Graphic by T. Eymann)



Agent-Based Computational Finance: Website (1)



Bookmarks Location: <http://www.unet.brandeis.edu/~blebaron/act/index.htm> What's Related

Agent Based Computational Finance

Introduction

[Personal Links](#)
[Group Links](#)
[Reading List](#)

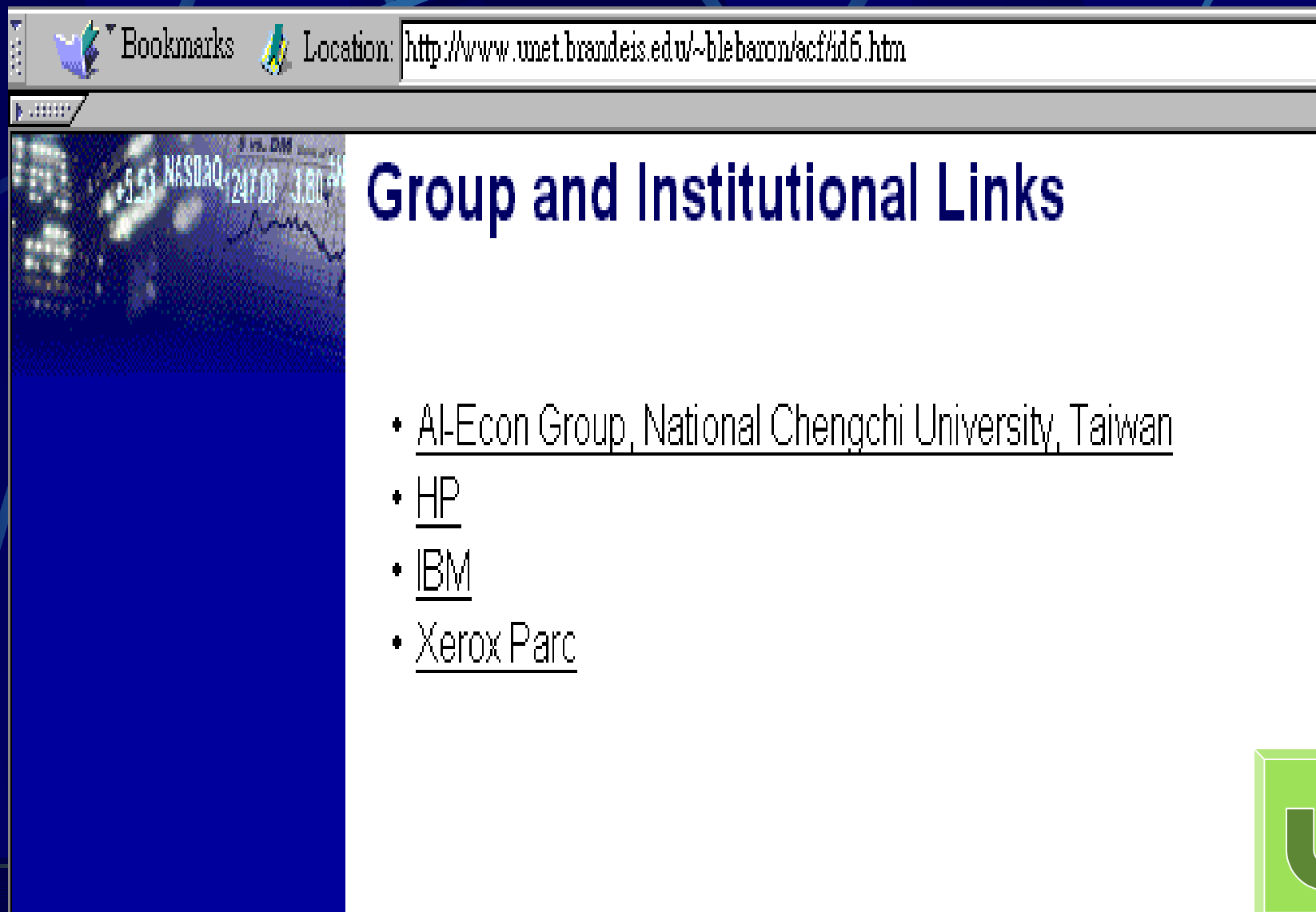
Agent based computation finance is an application of agent based computational methods to finance and financial markets. This area borrows heavily on methods developed in other agent based economic environments. This modest web page is designed to give researchers interested in the area a starting point in terms of finding what is available on the web, and useful publications.

This is only a subset of the much broader field of agent based computational economics which can be found at the very extensive [ACE website](#) maintained by Leigh Tesfatsion.

This site is maintained by [Blake LeBaron](#) at the Graduate School of International Economics and Finance, Brandeis University. Any additions or corrections that you would like to send would be appreciated.



Agent-Based Computational Finance: Website(2)



The image shows a screenshot of a web browser window. The address bar contains the URL <http://www.unet.brandeis.edu/~blebaron/acf/id6.htm>. The page content features a blue header with the title "Group and Institutional Links" and a list of links:

- [AI-Econ Group, National Chengchi University, Taiwan](#)
- [HP](#)
- [IBM](#)
- [Xerox Parc](#)

The left side of the browser window shows a sidebar with a blue background and a small image of a city at night with financial data overlays.



AI-ECON Research Group: The Goal on Research and Education

- AI-ECON Research Group is devoted to the study on Growing Economies from the Bottom Up with Simulating Evolution and Learning .
- AI-ECON Research Group is also devoted to the Development of Software for Teaching Agent-Based Computational Economics.



AI-ECON Research Group: Contribution to Research

- **Publications**
- **Organizing International Conferences**
- **Constructing a Website**
- **Editing Special Issues for Journals and International Publishers**
- **Invited to Give Plenary Speech or Keynote Speech on International Conferences**
- **Giving Tutorial on Advanced Topics on International Conferences**



AI-ECON Research Group Hosted Conference: CIEF'2000

The First International Workshop on Computational Intelligence in Economics and Finance (CIEF'2000)

February 27-March 3, 2000

<http://www.ecn.duke.edu/ACIS/>

<http://econm.nccu.edu.tw/conferences/CIEF00.htm>

Keynote Speech:

Agent-Based Computational Economics: Growing Economies from the Bottom Up

Leigh Tesfatsion

Department of Economics
Iowa State University

Call for Papers

The First International Workshop on Computational Intelligence in Economics and Finance (CIEF'2000) will be held as a part of the 19th Asia Conference on Information Science. Computational intelligence, usually known as a collection of techniques, including artificial neural networks, fuzzy logic, evolutionary algorithms, etc., is one of the most important tools in contemporary economics and finance. Over the last decade, computational intelligence has been widely used in various economical and financial modeling, prediction, and analysis. The most noticeable application of computational intelligence is in financial data mining.

In addition to financial data mining, computational intelligence has also been intensively used in the research area known as agent-based computational economics where global regularities arise from the bottom up, through repeated local interactions of numerous agents. Computational intelligence provides a tool to model these autonomous agents and their interactions. Issues addressed include the replication of laboratory results with human subjects, equilibrium selection, the emergence of the representative agent, rational expectations, markets and money, simulations of artificial stock markets and other social processes.

We see a need to bring together people with diverse backgrounds who share the same interests in their closely related studies. This conference serves this purpose.

Topics of Interest:

Application Areas:

Application areas may include, but are not limited to:

- Agent-Based Computational Economics
- Artificial Stock Markets
- Simulation of Social Processes
- Evolutionary Game and Industrial Organization
- Financial Engineering
- Financial Decision Making
- Trading Strategies
- Hedging Strategies
- Portfolio Management
- Derivative Pricing
- Term Structure Models
- Financial Time Series Forecasting and Analysis

Paper Submission

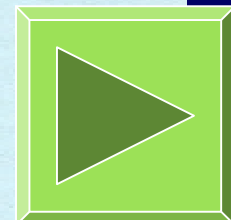
Papers describing new techniques and/or novel applications are welcome. All papers should be no more than 4 pages of 10-point font, double column, single-spaced text, with figures and tables included. Papers should be sent to:

Shu-Hung Chen
AI-ECON Research Group
Department of Economics
National Chengchi University
Taipei, Taiwan 11523
Email: chchen@nccu.edu.tw

Techniques:

- Artificial Neural Networks
- Fuzzy Logic
- Evolutionary Strategies
- Evolutionary Programming
- Genetic Algorithms
- Genetic Programming
- Statistical Classifiers
- Cluster Analysis
- Decision Trees
- Inductive Logic Programming
- Self-Organizing Maps
- Reinforcement Learning
- Wavelets
- Rough Sets
- Support Vector Machine
- Hybrid Systems

While hard copies are acceptable, electronic submissions via IPS or PDF files are highly encouraged. Authors who use electronic submissions should send a separate email in plain text to indicate this.



International Program Committee



CEF 2000

Barcelona, July 6-8

Computing in Economics and Finance ' 2000

Program Committee

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- [Bill Goffe](#), University of Southern Mississippi, USA



[Conference Poster](#)

[Call for papers](#)

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AI-ECON Research Group: The Website

Bookmarks Location: <http://econo.nccu.edu.tw/ai/www.html> What's Related

人工智慧經濟學研究群
AI-ECON Research Group

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Taipei, Taiwan 116

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	Graduate Study		Job Opportunity
	Discussions for Papers		Useful Web Sites

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Editing the Book "Evolutionary Computation in Economics and Finance"

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Professor Shu-Heng Chen
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Taiwan

Dear Professor Chen,

Thank you very much for returning the signed copies of the publishing agreement for your proposed edited book **Evolutionary Computation in Economics and Finance**, to appear in our series **Studies in Fuzziness and Soft Computing**. Please find enclosed a countersigned copy of the contract for your file.

We fully agree with the intended size of about 550 pages as well as with the delivery of the manuscript in March 2000.

Looking forward to our collaboration I remain with my best wishes for a happy New Year

yours sincerely,

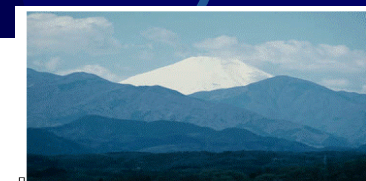
Dr. Martina Bihn
Economics Editor

Enclosure



AI-ECON Research Group: Plenary Speech

JAFEE2000 25-26th March 2000 at Ochanomizu, Tokyo



DMt. Fuji, as watched from Tama Campus, Chuo University

March 26th

	Rm.1	Rm.2	Rm.3	Rm.4	Rm.5
9:10-9:55	Plenary Talk Shu-Heng Chen (National Chengchi University, Taipei, Taiwan)				
10:00-12:00	Session 1-4 Nonlinear Dynamics 3	Session 2-4 Experimental Economics 2	Session 3-4 Multiagnet System 4	Session 4-1 in Jpananese	Session 5-4 in Jpananese
12:00-13:10	Lunch Break				
13:10-13:55	Plenary Talk Tony Lawson (University of Cambridge, UK)				
14:00-15:00	General Meeting				
15:00-15:15	Coffee Break				
15:15-17:15	Session 1-5 Panel Discussion	Session 2-5 in Japanese	Session 3-5 in Jpananese	Session 4-5 in Jpananese	Poster Session
17:15-17:30	Closing Speech Yoshinori Shiozawa: Vice President of JAFEE				
18:00	Informal Get Together				



AI-ECON Research Group: Tutorial



Congress on Evolutionary Computation

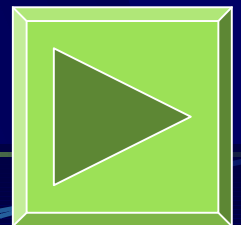
La Jolla Marriott, San Diego, USA, 16-19 July 2000

TA1: Introduction to Evolutionary Computation <i>David Fogel</i>	TB1: Genetic Programming in Economics and Finance <i>Shu-Heng Chen</i>	TC1: Evolutionary Optimization and Constraints <i>Z. Michalewicz</i>	TD1: Evolving Connectionist Systems: Methods, Tools and Applications <i>Nik Kasabov</i>
TA2: Introduction to Genetic Programming <i>Peter Angeline</i>	TB2: Bioinformatics <i>David Wolfe Corne</i>	TC2: Distributed and Parallel EC <i>Tomoyuki Hiroyasu</i>	TD2: Evolutionary Generalisation <i>Ibrahim Kuscü</i>
TA3: Introduction to Evolution Strategies <i>Hans-Georg Beyer</i>	TB3: Immunological Computation: Theory and Applications <i>Dipankar Dasgupta</i>	and <i>Marco Tomassini</i>	TD3: Evolutionary Computation Models from Population Genetics <i>Buster Greene</i>



AI-ECON Research Group: Contribution to Graduate Education

- **Innovative Curriculum Design**
- **Short Courses and Seminars**
- **Joint Training Program with International Universities or Research Institutes**



AI-ECON Research Group: Contribution to Undergraduate Education

- **Developing Education Software**
- **Internet Summer Workshop**



AI-ECON Research Group: Short Course Series



Short Course - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://econo.nccu.edu.tw/ai/shortcourse.htm> What's Related

Short Course Series

Last modified: 12/14/1999

Series	Instructor	Affiliation	Topic	Date	Place
9801	Chun-Lung Lian	Institute of Information Science, Academia Sinica	Rough Sets in Financial Data Mining	5:30-7:30 p.m., 10/2/98	Room 7212, Chi-Tao Building
9802	Simon Bennett	Computational Intelligence Research Group, De Montfort University Leicester, U.K.	The Choice of Neural Network Topology for Predicting Corporate Bankruptcy	2:00-4:00 p.m., 10/27/98	Room 7218, Department of Economics, Chi-Tao Building
9803	Maiga Chang	Multimedia Communication System Laboratory, Chung Yuan Christian University	An Introduction to ID.3, C4.t and All that	8:00-10:00 p.m., 11/6/98	Room 7212, Chi-Tao Building
9804	Wen-Liang Hwang	Institute of Information Science, Academia Sinica	Wavelets for Beginner	5:30-7:30 p.m., 11/9/98	Room 7212, Chi-Tao Building
9805	Wen-Liang Hwang	Institute of Information Science, Academia Sinica	From Fourier Transform to Wavelets	5:30-7:30 p.m., 11/30/98	Room 7212, Chi-Tao Building
9806	Ying Chang	Institute of Information Science, Academia Sinica	Evolving Recurrent Neural Networks	5:30-7:30 p.m., 12/1/98	Room 7212, Chi-Tao Building
9807	Peter J. S. Pan	Department of Electronic Engineering, National Kaohsiung Institute of Technology	Application of the Optimizaton Techniques with Wavelets	5:30-7:30 p.m., 12/18/98	Room 7212, Chi-Tao Building
9808	Paul P. Wang	Electrical and Computer Engineering, Duke University	Theoretical Consideration toward the Modeling of Intelligent and Complex Systems	10:30-12:00 a.m. 12/21/98	Room 7212, Chi-Tao Building
9809	Jia-Sheng Heh	Multimedia Communication System Laboratory, Department of Information and Computer Engineering, Chung Yuan Christian University	Self-Organizing Maps	5:30-7:30 p.m., 12/21/98	Room 7212, Chi-Tao Building
9810	Jang-Ting Guo	Department of Economics, University of California, Riverside	Fiscal Policy, Increasing Returns and Endogenous Fluctuations	2:00-4:00 p.m., 12/22/98	Room 7218, Chi-Tao Building
9901	Janusz Kacprzyk	Systems Research Institute Polish Academy of Sciences, Warsaw, Poland	Soft Computing in Financial Engineering	Expected to be held at	Room 7212, Chi-Tao Building

AI-ECON Research Group: Software

The Software of Genetic Programming Applied on Economics and Finance

Financial Data Mining

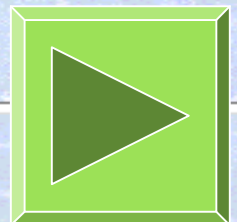
- [Price Forecasting](#)
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Agent-Based Computational Economics

- [Cobweb Model](#)
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- [Artificial Stock Market](#)
Readme Document

Last modified: 1999/7/27.

Since 98/12/11, you are the  visitors.



AI-ECON Research Group: Step-by-Step Software Manual

說明內容

程式安裝

程式安裝

設定參數檔

Cobweb11 模擬程式可分成下列三大部份,其安裝方法說明如下:

運算元(子)設定

1. 程式執行檔: Cobweb11.exe
2. 參數設定檔: Cobweb11.ini.
3. 資料檔: P.TXT

準備資料檔

執行程式

其中,所有的程式執行檔與參數設定檔均須存放於同一目錄中. 而資料檔存放的目錄則定義於[Cobweb11.ini](#)中, 此部份可參閱[準備資料檔](#)部份.

查看結果



AI-ECON Research Group: Software (Window Version)

GP2000 in Double Auction

Run Again

參數設定

Buyer

Seller

競賽過程

Traders's Gain

Traders's Tokens

GP Structure

Population :

30

Generation :

10

Trading Period Size:

3

Test Paper.1 Seed: 5221

R1~R4: 242 8 8 2

244 244 243 244 , 238 237 238 237

243 243 243 243 , 240 241 240 240

242 243 242 242 , 241 241 241 241

240 239 240 239 , 242 242 241 242

Test Paper.2 Seed: 1397

R1~R4: 2 26 19682 2186

16039 17757 16230 17474 , 1788 2060 269 2005

12711 13619 13588 11876 , 1967 2108 3080 2170

1989 2130 3102 2192 , 12689 13597 13566 11854

1810 2082 291 2027 , 16017 17735 16208 17452

Test Paper.3 Seed: 3533

R1~R4: 26 242 26 26

47 55 42 46 , 32 19 32 24

41 48 41 42 , 36 24 36 34

39 27 39 37 , 38 45 38 39

35 22 35 27 , 44 52 39 43



AI-ECON Research Group: Future Plans

- Organizing the 3rd Asia-Pacific Conference on Genetic Algorithms and the first International Workshop on Agent-Based Computational Social Sciences
- Putting out the International Journal *Compumetrics*
- Establishing the Lab on Agent-Based Computational Social Sciences



AI-ECON Research Group Hosted Conference: APGA'2002

WE ARE HONG KONG 香港 City of Life

Call for Papers

APGA '2000

The Second Asia-Pacific Conference
on Genetic Algorithms and Applications
May 3-5, 2000, Hong Kong



AI-ECON Research Group: International Journal Compumetrics



Compumetrics



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[Aims & Scope](#)

[Guidelines](#)

Welcome to Compumetrics

Compumetrics is an international journal that publishes refereed papers on using computational methods, techniques, and algorithms in scientific research and decision-making. We welcome high quality submissions mostly of applied nature but not exclusively.



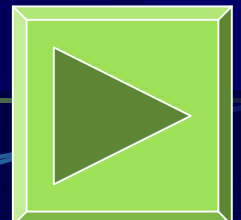
AI-ECON Research Group: The Necessity of a Computer Lab

- **Parallel Computing**
- **Evolving Artificial Markets**
- **Evolving Artificial Societies**



References (1)

- 陳樹衡 (1993), “論經濟學之認知基礎: 經濟學之關於消件、資訊與計算理論的統合性架構”, 國立政治大學研究通訊, 第一期, 33--73頁.
- Chen, S.-H (1997), “Computational Economics: The Growth of Computer Power in Economics,” in T. Philip (ed.),” Proceedings of the 10th International Conference on Computer Applications in Industry and Engineering (CAINE'97), San Antonio, Texas, December 10-12, 1997. ISBN: 1-880843-22-6. pp. 144-148.



References (2)

- Chen, S.-H. and S.Wang (1997), "Energizing Economics Eductaion with Computer Power (I): Core Courses," in T. Philip (ed.), Proceedings of the 10th International Conference on Computer Applications in Industry and Engineering (CAINE'97), San Antonio, Texas, December 10-12, 1997. ISBN: 1-880843-22-6. pp. 149-153.



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