



CONFERENCE PROGRAM

Genetic and Evolutionary Computation Conference

July 9 – 13, 2002

The Roosevelt Hotel
New York City, NY, USA

A Recombination of the Seventh Annual Genetic Programming Conference and
the Eleventh International Conference on Genetic Algorithms

International Society for Genetic and Evolutionary Computation, Inc.
In Association with the American Association for Artificial Intelligence

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Registration Times

Tuesday: 7:30 – 5:00pm

Wednesday – Friday: 8:00am – 5:00pm

Saturday: 8:00am – 2:00pm

The registration will take place in the Palm room. The staff at the registration desk will happily answer any questions you may have about the conference.

Exhibits

Visit the exciting exhibits from the following vendors:

- Morgan Kaufmann
- MIT Press
- Elsevier Science
- Kluwer Academic Publishers
- NuTech Solutions

All exhibits will be located in the Grand Ballroom Foyer. Exhibition times are Tuesday 1:00 – 5:00pm, Wednesday–Friday 8:30AM–5:30PM, and Saturday 8:30AM – 1:30PM.

GECCO-2002 Organizers

International Society for Genetic and Evolutionary Computation, Inc.

In association with the American Association for Artificial Intelligence (AAAI), 445 Burgess Drive, Menlo Park, CA 94025

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Tang, Michael Vose

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SUPPORT FOR STUDENT TRAVEL DONATED BY:

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A-Life, Adaptive Behavior, Agents, and Ant Colony Optimization

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DNA and Molecular Computing

Natasha Jonoska (chair)

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Peter Nordin
Bryan Norman
Wim Nuijten
Martin Oates
Gabriela Ochoa
Markus Olhofer
Bjorn Olsson
Michael O'neill
Ibrahim Osman
Ben Paechter
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Gary Parker
I.C. Parmee
Witold Pedrycz
Martin Pelikan
Francisco Pereira
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Anabela Simmes
Mark Sinclair
Moshe Sipper
Jim Smith
Robert Smith
Alan Soper
Andreas Spillner
Louis Steinberg
Chris Stephens
Soraya Stevens
Harmen Sthamer
Adrian Stoica
Wolfgang Stolzmann
Thomas Stutzle
Joe Suzuki
Gil Syswerda
Keiki Takadama
Uwe Tangen
Ernesto Tarantino
Gianluca Tempesti
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Jean-Paul Watson
Richard Watson
Ingo Wegener
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Man Leung Wong
Alden Wright
Annie Wu
Masayuki Yamamura
Jihoon Yang
Moritoshi Yasunaga
John Yen
Zheng Yi Wu
Tina Yu
Young Su Yun
Ricardo Zebulum
Andreas Zell
Byoung-Tak Zhang
Gengui Zhou

Best-Paper Awards

As part of the double-blind peer review, the 31 papers listed below were nominated for consideration for a best paper award. The winners of this award will be selected by secret vote by the registered attendees to the conference. For this, you should have received two (2) ballots to elect the best papers with your registration package (one ballot is for papers presented on Thursday and the other for papers presented on Friday). If you did not receive two ballots, please contact the registration desk immediately.

Papers compete in different categories according to the deme to which they were submitted (e.g., GA papers compete only against other GA papers). Please return your ballot to the registration desk at the end of each day, so we can count the votes and announce the winners promptly.

Throughout this schedule, nominated papers are highlighted with a star (★) to make them easier to find. All papers have the deme they were submitted to listed along the title to help with write-in votes.

- Dynamic Search with Charged Swarms* (AAAA), T. M. Blackwell, P. J. Bentley
- Intelligent Packets for Dynamic Network Routing Using Distributed Genetic Algorithm* (AAAA), Suihong Liang, A. Nur Zincir-Heywood, Malcolm Heywood
- A DNA -based Three-State Device* (DNA), Bernard Yurke, Friedrich Simmel
- Lens System Design and Re -Engineering with Evolutionary Algorithms* (EH), Julie Beaulieu, Christian Gagné, Marc Parizeau
- A Modified Compact GA for the Intrinsic Evolution of Continuous Time Recurrent Neural Networks* (EH), John Gallagher, Saranyan Vignraham
- On the Convergence Properties of a Simple Self-Adaptive Evolutionary Algorithm* (ES), John Delaurentis, Lauren Ferguson, William Hart
- An Analysis of the Role of Offspring Population Size in EA's* (ES), Thomas Jansen, Kenneth De Jong
- On the Dynamics of Evolutionary Multi -Objective Optimization* (ES), Tatsuya Okabe, Yaochu Jin, Bernhard Sendhoff
- A Permutation Genetic Algorithm for Variable Ordering in Learning Bayesian Networks from Data* (GA), William Hsu, H. Guo, B. Perry, J. Stilson
- A Comparison of Two Competitive Fitness Functions* (GA), Liviu Panait, Sean Luke
- Voronoi Quantized Crossover for Traveling Salesman Problem* (GA), Dong-il Seo, Byung-Ro Moon
- Efficient Reinforcement Learning through Evolving Neural Network Topologies* (GA), Kenneth Stanley, Risto Miikkulainen
- Archiving with Guaranteed Convergence and Diversity in Multi-Objective Optimization* (GA), Marco Laumanns, Lothar Thiele, Eckart Zitzler, Kalyanmoy Deb
- Genetic Programming and Multi-Agent Layered Learning by Reinforcements* (GP), William Hsu, Steven Gustafson
- On the Search Biases of Homologous Crossover in Linear Genetic Programming and Variable-Length Genetic Algorithms* (GP), Riccardo Poli, Christopher Stephens, Alden Wright, Jonathan Rowe
- Fitness Distance Correlation and Problem Difficulty for Genetic Programming* (GP), Manuel Clergue, Philippe Collard, Marco Tomassini, Leonardo Vanneschi
- A Survey and Analysis of Diversity Measures in Genetic Programming* (GP), Edmund Burke, Steven Gustafson, Graham Kendall
- A Re -Examination of the Cart Centering Problem Using the Chorus System* (GP), R. Muhammad, Atif Azad, Conor Ryan, Mark Burke, Ali R. Ansari
- Is the Perfect the Enemy of the Good?* (GP), Sean Luke, Liviu Panait
- Hyper-Heuristics: Learning to Combine Simple Heuristics in Bin-Packing Problems* (LCS), Peter Ross, Sonia Schulenburg, Javier Marín-Blázquez, Emma Hart
- Genetic Algorithms and Fine-Grained Topologies for Optimization* (MPP), Xiaotong Wang, Lawrence Davis, Chunsheng Fu
- Evolutionary Computation as a Form of Organization* (MPP), Alexander Kosorukoff, David E. Goldberg
- Creation of a Learning, Flying Robot by Means of Evolution* (ROB), Peter Augustsson, Peter Nordin, Krister Wolff
- Adaptive Reconfiguration of Data Networks Using Genetic Algorithms* (RWA), David Montana, Talib Hussain, Tushar Saxena
- A Genetic Hybrid for Critical Heat Flux Function Approximation* (RWA), Yung-Keun Kwon, Sung-Deok Hong, Byung-Ro Moon
- Application of Genetic Algorithms to the Discovery of Complex Models for Simulation Studies in Human Genetics* (RWA), Jason Moore, Lance Hahn, Marylyn Ritchie, Tricia Thornton, Bill White
- Gaphyl: An Evolutionary Algorithms Approach for the Study of Natural Evolution* (RWA), Clare Bates Congdon
- Evolving Neural Networks for the Classification of Galaxies* (RWA), Erick Cantú-Paz, Chandrika Kamath
- Search Heuristics, Case-Based Reasoning and Software Project Effort Prediction* (SBSE), Colin Kirsopp, Martin Shepperd, John Hart
- Improving Evolutionary Testing by Flag Removal* (SBSE), Mark Harman, Lin Hu, Robert Hierons, Andre Baresel, Harmen Sthamer
- A Savings Based Ant System for the Vehicle Routing Problem* (SCH), Marc Reimann, Michael Stummer, Karl Doerner

About the Evolutionary Computation in Industry Track

This year's GECCO will contain a new track called Evolutionary Computation in Industry (ECI). We expect that the presentations in this track will be of most use to managers, technology scouts, and other individuals interested in assessing the potential of evolutionary algorithms to solve their industrial optimization problems. The goal of the presenters in this track is to tell you about the realities and possibilities of evolutionary algorithm applications and to describe successful industrial applications, rather than to focus on technical details and the particular approaches taken.

There are seven sessions in the Evolutionary Computation in Industry track:

- The first session follows the GECCO plenary talk by David Leinweber on evolutionary algorithm **applications in the capital markets**, and contains an overview, some very interesting approaches to trading using evolutionary algorithms, and a panel discussion on the state of the art in evolutionary computation and the capital markets. (Thursday July 11, 10:30am–12:00pm)
- The second session introduces the topic of **applying evolutionary computation in industry**, and contains two presentations containing important lessons learned from the process of fielding real-world applications of evolutionary algorithms. (Thursday July 11, 1:30pm–3:00pm)
- The third session contains descriptions of three products for the **banking industry**, each of which contains an evolutionary algorithm playing a critical role. (Thursday July 11, 3:30pm–5:30pm)
- The fourth session concerns evolutionary algorithms and **scheduling/logistics problems**, an area in which evolutionary algorithms are performing particularly well; this session also contains a panel discussion about the state of the art in evolutionary algorithms, scheduling, and logistics. (Friday July 12, 8:30am–10:00am)
- The fifth session concerns evolutionary algorithms and **design**, and includes talks showing that artificial evolution can produce industrial designs that are as innovative, amazing, and effective as the designs produced by evolution in the natural world. (Friday July 12, 1:30pm–3:00pm)
- The sixth session concerns evolutionary algorithms and **chemistry**, and includes a range of presentations demonstrating the power of evolutionary algorithms for solving the hardest problems encountered in the chemical industry. (Friday July 12, 3:30pm–5:30pm)
- The seventh session is a **working session** of sorts—in it a variety of real-world problems will be presented to experts, and the experts will discuss the suitability of these problems for high-impact evolutionary algorithm solutions. (Saturday July 13, 10:30am–12:00pm)

All ECI sessions will take place in the Vanderbilt Suite.

Tuesday July 9 Schedule at a Glance			
	8:30am – 12:30pm	12:30pm – 2:00pm	2:00pm – 6:00-pm
Terrace	Graduate Student Workshop	Lunch on your own	Graduate Student Workshop
Ballroom	EC. and Multi-Agent Systems (ECOMAS 2002)		EC and Multi-Agent Systems (ECOMAS 2002)
Broadway	ISGEC Workshop on Standards		Learning and Adaptation in EC
Vanderbilt	Approximation and Learning in EC		Understanding Coevolution
Promenade	Grammatical Evolution (GEWS 2002)		Representations for GEC
Plaza	EC for Optimization in Industry		Biological Applications of EC
Fifth Avenue	Interative Evolutionary Search and Exploration Systems		Scheduling: Theory and Practice
Riverside	Intelligent Interface and Interacting Agents		

COFFEE BREAKS

10:20AM – 10:40AM AND 3:50AM – 4:10PM

There will be coffee stations in the Conference and Mezzanine Levels

Workshops Schedule. Tuesday July 9, 2002

Full Day Workshops (8:30am – 6:00pm)

Graduate Student Workshop Sean Luke, Conor Ryan, Maarten Keijzer	Terrace
Evolutionary Computation and Multi-Agent Systems (ECOMAS 2002) Robert E. Smith, Claudio Bonacina, Cefn Hoile and Paul Marrow	Grand Ballroom

Morning Workshops (8:30am – 12:30pm)

WA1: Approximation and Learning in Evolutionary Computation Yaochu Jin, Sushil J. Louis and Khaled M. Rasheed	Vanderbilt
WA2: Evolutionary Computation for Optimization in Industry Rajkumar Roy and Ashutosh Tiwari	Plaza
WA3: Grammatical Evolution Workshop (GEWS 2002) Michael O'Neill and Conor Ryan	Promenade
WA4: Intelligent Interface and Interacting Agents Oswaldo Velez-Langs, Angelica de Antonio, Ricardo Imbert Paredes	Riverside
WA5: ISGEC Workshop on Standards Peter J Bentley	Broadway
WA6: Toward Interactive Evolutionary Search and Exploration Systems Ian Parmee	Fifth Avenue

Afternoon Workshops (2:00pm – 6:00pm)

WP1: Biological Applications of Evolutionary Computation Wolfgang Banzhaf and James A. Foster	Plaza
WP2: Learning and Adaptation in Evolutionary Computation Sibylle Mueller, Nicol Schraudolph and Petros Koumoutsakos	Broadway
WP3: Representations for Genetic and Evolutionary Algorithms Franz Rothlauf	Promenade
WP4: Scheduling: Bringing Together Theory and Practice Peter Cowling and Graham Kendall	Fifth Avenue
WP5: Understanding Coevolution: Theory and Analysis of Coevolutionary Algs. R. Paul Wiegand and Kenneth A. De Jong	Vanderbilt

Wednesday July 10 Schedule at a Glance

	8:30am–10:15am	10:15–10:35	10:35am–12:20pm	12:20pm–1:50pm	1:50pm–3:35pm	3:35–3:55	3:55–5:40
Terrace	Modeling Financial Markets	Break	Parallel GAs	Lunch on your own	Creative Evolutionary Systems	Break	Unified Overview of EC
Riverside	Intro to Genetic Algorithms				Evolutionary Robotics		Ant Colony Optimization
Promenade	Evolution of Sensors		Intro to GP		Bionics		Evolvable Hardware
Fifth Avenue	Introduction to Genetics		Making GAs Work in the Real World		Probabilistic Model-Building GAs		Scheduling and Routing
Vanderbilt	Quantum Computing		Intro to Learning Classifier Systems		Intro to GA Theory		Software Testing via EC
Plaza	Foundations of GP I		Foundations of GP II				Immunological Computation
Ballroom	Competent GAs		No Free Lunch and Beyond		Multiobjective GAs		Visualization in EC
Fashion	Intro to Evolution Strategies				Grammatical Evolution		Intro to Geno-Fuzzy Systems

CONFERENCE OPENING RECEPTION 6:30PM – 7:30PM GRAND BALLROOM
 Greet old friends and make new ones at the opening reception. Light refreshments will be served.

Tutorials Schedule. Wednesday July 10, 2002

8:30am – 10:15am

TA1-1 The Design of Competent GAs: Toward a Computational Theory of Innovation, <i>David E. Goldberg</i>	Grand Ballroom
TA1-2 Evolution of Sensors, <i>Daniel Polani, Thomas Uthmann</i>	Promenade
TA1-3 Foundations of Genetic Programming I, <i>W. Langdon, R. Poli</i>	Plaza
TA1-4 Introduction to Genetics, <i>Annie Wu</i>	Fifth Avenue
TA1-5 Introduction to Evolution Strategies, <i>Ingo Rechenberg</i>	Fashion
TA1-6 An Introduction to Genetic Algorithms: Theory and Practice, <i>R. Heckendorn</i>	Riverside
TA1-7 Modeling Real and Artificial Financial Markets, <i>Sonia Schulenburg</i>	Terrace
TA1-8 Quantum Computing for Genetic Programmers, <i>Lee Spector</i>	Vanderbilt

10:35am– 12:20pm

TA2-1 No Free Lunch and Beyond, <i>Darrell Whitley</i>	Grand Ballroom
TA2-2 Making GAs Work in the Real World: Guidelines from Competent GA Theory, <i>B. Minsker, P. Reed</i>	Fifth Avenue
TA2-5 Foundations of Genetic Programming II, <i>W. Langdon, R. Poli</i>	Plaza
TA2-6 An Introduction to Learning Classifier Systems, <i>Pier Luca Lanzi</i>	Vanderbilt
TA2-7 Introduction to Genetic Programming, <i>John Koza</i>	Promenade
TA2-8 Parallel Genetic Algorithms, <i>Erick Cantú-Paz</i>	Terrace

1:50pm– 3:35pm

TP1-1 Bionics: Building on Bio-Evolution, <i>Ingo Rechenberg</i>	Promenade
TP1-2 Creative Evolutionary Systems, <i>Peter Bentley</i>	Terrace
TP1-3 Evolutionary Robotics, <i>A. Schultz, M. Potter</i>	Riverside
TP1-5 An Introduction to Genetic Algorithms Theory, <i>Jonathan Rowe</i>	Vanderbilt
TP1-6 Grammatical Evolution, <i>C. Ryan, M. O'Neill</i>	Fashion
TP1-7 Multiobjective Genetic Algorithms, <i>Carlos Coello</i>	Grand Ballroom
TP1-8 Probabilistic Model Building GAs, <i>Martin Pelikan</i>	Fifth Avenue

3:55pm– 5:40pm

TP2-1 Ant Colony Optimization: An Introduction, <i>Martin Middendorf</i>	Riverside
TP2-2 Evolvable Hardware and its Industrial Applications, <i>Tetsuya Higuchi</i>	Promenade
TP2-3 Evolutionary Scheduling and Routing, <i>Peter Ross</i>	Fifth Avenue
TP2-4 Immunological Computation, <i>Dipankar Dasgupta</i>	Plaza
TP2-5 Introduction to Adaptive Geno-Fuzzy Systems, <i>Charles Karr</i>	Fashion
TP2-6 Software Testing via EC, <i>J. Wegener, M. Harman</i>	Vanderbilt
TP2-7 Evolutionary Computation: a Unified Overview, <i>Kenneth De Jong</i>	Terrace
TP2-8 Visualization in Evolutionary Computation, <i>Christian Jacob</i>	Grand Ballroom

6:30pm – 7:30pm

OPENING RECEPTION

GRAND BALLROOM

Greet old friends and meet new ones at the conference's opening reception!

The reception is free to all registered GECCO attendees. Cheese, fruit, vegetables, and wine will be served.

Your badge is your admission ticket, please remember to wear it.

Thursday July 11 Schedule at a Glance

	8:30 – 10:00	10:00 – 10:30	10:30 – 12:00	12:00 – 1:30	1:30 – 3:00	3:00 – 3:30	3:30 – 5:30
Terrace	Plenary Talk: Evolutionary Algorithms in the Financial Markets, David Leinweber Terrace	Break	GP Nominated I ★	Lunch (on your own)	GP Nominated II ★	Break	AAAA/SBSE Nominated ★
Ballroom			RWA Nominated I ★		RWA Nominated II ★		MPP/EH Nominated ★
Vanderbilt			ECI: EAs and the Capital Markets		ECI: EAs in Industry		ECI: Banking Applications
Plaza			Efficiency		GA Methods		GP Methods
Fifth Avenue			Evolutionary Programming		Modeling and Regression		Ants
Promenade			GAs and Neural Networks		Multiobjective GAs I		GA Misc
Broadway			Linkage		GA Theory		Image Analysis
Riverside			Late Breaking Papers		Late Breaking Papers		Late Breaking Papers

★ Denotes sessions with nominated papers. Remember to vote and return your ballot at the end of the day to the registration desk.

Thursday July 11, 8:30am – 10:00am

KEYNOTE TALK

TERRACE

Evolutionary Algorithms in the Financial Markets

David Leinweber

Caltech

“Why don’t computers have all the money? Will they?” Computers have achieved astonishing levels of performance at tasks ranging from chess to oil exploration. Natural evolution has produced an even more astonishing variety of innovations in the biological world. Can we expect to see computerized trading and investment strategies evolve to the level of competence seen in other domains?

Participants in securities markets need to detect, prioritize, predict and act on relevant information. In an increasingly rich financial information environment, genetic and evolutionary ideas are particularly applicable on greater Wall Street. However, there are serious perils in the misapplication of these techniques. Many a modeler has perished in the depths of the data mine.

This talk will introduce people from Wall Street to the promise of evolutionary computing, and try to advise EC practitioners on how to avoid the subtle biases and pitfalls characteristic of financial information.

The financial applications panel following this talk elaborates and expands on these subjects (EAs in the Financial Markets, Vanderbilt Room, 10:30am – 12:00pm).

David Leinweber (djl@caltech.edu) is a visiting faculty member in Economics at Caltech, and a consultant to securities and investment firms. Previously, he managed over \$6 billion in quantitative equity portfolios and was the founder of two financial information technology firms. His webpage, <http://www.hss.caltech.edu/~djl/>, contains more information on the subjects discussed here.

Thursday July 11, 10:30am – 12:00pm

GP NOMINATED PAPERS I

TERRACE

CHAIR: WILLIAM B. LANGDON

- ★ *Genetic Programming and Multi-Agent Layered Learning by Reinforcements* (GP)
William Hsu, Steven Gustafson
- ★ *On the Search Biases of Homologous Crossover in Linear Genetic Programming and Variable Length Genetic Algorithms* (GP)
Riccardo Poli, Christopher Stephens, Alden Wright, Jonathan Rowe
- ★ *Fitness Distance Correlation and Problem Difficulty for Genetic Programming* (GP)
Manuel Clergue, Philippe Collard, Marco Tomassini, Leonardo Vanneschi

RWA NOMINATED PAPERS I

BALLROOM

CHAIR: RAJKUMAR ROY

- ★ *Adaptive Reconfiguration of Data Networks Using Genetic Algorithms* (RWA)
David Montana, Talib Hussain, Tushar Saxena
- ★ *A Genetic Hybrid for Critical Heat Flux Function Approximation* (RWA)
Yung-Keun Kwon, Sung-Deok Hong, Byung-Ro Moon
- ★ *Application of Genetic Algorithms to the Discovery of Complex Models for Simulation Studies in Human Genetics* (RWA)
Jason Moore, Lance Hahn, Marylyn Ritchie, Tricia Thornton, Bill White

ECI: EAs AND THE CAPITAL MARKETS

VANDERBILT

CHAIR: DAVID LEINWEBER

The Promise of Evolutionary Computation on Wall Street
David Leinweber, California Institute of Technology

A Learning Evolutionary Trading System LETS
Sonia Schulenburg and Peter Ross, Napier University

Panel discussion led by David Leinweber

Panelists include Sonia Schulenburg of Napier University, Jasmina Arifovic of Simon Fraser University, and Steven Jay Snider of Fidelity Investments.

EFFICIENCY

PLAZA

CHAIR: LARRY BULL

Genetic Algorithms, Efficiency Enhancement, and Deciding Well with Differing Fitness Variances (GA)
Kumara Sastry, David E. Goldberg

Genetic Algorithms, Efficiency Enhancement, and Deciding Well with Differing Fitness Bias Values (GA)
Kumara Sastry, David E. Goldberg

Expediting Genetic Search with Dynamic Memory (GA)
Keith Mathias, Jason Byassee

EVOLUTIONARY PROGRAMMING FIFTH AVE. CHAIR: INGO RECHENBERG

Convergence Velocity of Evolutionary Algorithm with Self-Adaptation (EP)
Mikhail Semenov

Evolutionary Programming Based Optimization Stratified Space Sampling (EP)
Brian Beachkofski and Gary B. Lamont

Adding Knowledge and Efficient Data Structures to Evolutionary Programming: A Cultural Algorithm for Constrained Optimization (EP)
Carlos Coello Coello, Ricardo Landa Becerra

GAs AND NEURAL NETS PROMENADE CHAIR: JOHN A. BULLINARIA

Exploring the Parameter Space of a Genetic Algorithm for Training an Analog Neural Network (GA)
Steffen Hohmann, Johannes Schemmel, Felix Schurmann, Karlheinz Meier

Combining Competitive and Cooperative Coevolution for Training Cascade Neural Networks (GA)
Alexander Tulai, Franz Oppacher

Neuron Reordering for Better Neuro-Genetic Hybrids (GA)
Byung-Ro Moon, Jung-Hwan Kim

LINKAGE BROADWAY CHAIR: MARTIN PELIKAN

LINKGAUGE: Tackling Hard Deceptive Problems with a New Linkage Learning Genetic Algorithm (GA)
Miguel Nicolau, Conor Ryan

Combining the Strengths of the Bayesian Optimization Algorithm and Adaptive Evolution Strategies (GA)
Martin Pelikan, David E. Goldberg, Shigeyoshi Tsutsui

Jumping Genes-Mutators Can Rise Efficacy of Evolutionary Search (GA)
Alexander Spirov, Alexander Kazansky

LATE BREAKING PAPERS I RIVERSIDE CHAIR: ANNIE WU

10:30 *The Effect of Diploidy on Integer Representations*
Ayse S. Yilmaz and Annie S. Wu

10:40 *Evolving Cellular Automata to Model Fluid Flow in Porous Media*
Tina Yu and Seong Lee

10:50 *The Role of Neutral and Adaptive Mutation in an Evolutionary Search on the OneMax Problem*
Tina Yu and Julian F. Miller

11:00 *Genetic Multi-Agent Planning of Self-Interested Agents*
Adina Magda Florea, Eugenia Kalisz, and Cosmin Carabelea

11:10 *Evolving from Genetic Algorithms to Flexible Evolution Agents*
Gabriel Winter, Blas Galván, Silvia Alonso, and Begoña González

11:20 *GLEAM – An Evolutionary Algorithm for Planning and Control Based on Evolution Strategy*
Christian Blume and Wilfried Jakob

11:30 *Oceanus: a Distributed Web-Based Framework for Execution of Genetic Algorithms*
Jie Chi, Alok Chaturvedi, Ananth Grama, and Shailendra Mehta

11:40 *Open BEAGLE: a New Versatile C++ Framework for Evolutionary Computation*
Christian Gagné and Marc Parizeau

11:50 *Evolving Perl*
Mark S. Withall, Chris J. Hinde, and Roger G. Stone

Thursday July 11, 1:30pm – 3:00pm

GP NOMINATED PAPERS II

TERRACE

CHAIR: JAMES A. FOSTER

- ★ *A Survey and Analysis of Diversity Measures N Genetic Programming* (GP)
Edmund Burke, Steven Gustafson, Graham Kendall
- ★ *A Re-Examination of the Cart Centering Problem Using the Chorus System* (GP)
R. Muhammad, Atif Azad, Conor Ryan, Mark Burke, Ali R. Ansari
- ★ *Is the Perfect the Enemy of the Good?* (GP)
Sean Luke, Liviu Panait

RWA NOMINATED PAPERS II

BALLROOM

CHAIR: ELIZABETH RUDNICK

- ★ *Gaphyl: An Evolutionary Algorithms Approach for the Study of Natural Evolution* (RWA)
Clare Bates Congdon
- ★ *Evolving Neural Networks for the Classification of Galaxies* (RWA)
Erick Cantú-Paz, Chandrika Kamath
- Alignment of Protein Structures with a Memetic Evolutionary Algorithm* (RWA)
B. Carr, W. Hart, N. Krasnogor, J. Hirst, E. Burke, J. Smith

ECI: EVOLUTIONARY ALGORITHMS IN INDUSTRY

VANDERBILT

CHAIR: RAJKUMAR ROY

- Evolutionary Computation in Industry*
Rajkumar Roy, Cranfield University and Lawrence “David” Davis, NuTech Solutions
- An Instructive Case of Enterprise Modeling and Optimization*
Lawrence “David” Davis, NuTech Solutions
- Lessons Learned: Evolutionary Computing in Product Development*
Wendy Williams, Metaheuristic Algorithms

GA METHODS

PLAZA

CHAIR: SUSHIL LOUIS

- Combining Evolutionary and Non -Evolutionary Methods in Tracking Dynamic Global Optima* (GA)
Simon Garrett, Joanne H. Walker
- The Effect of Cost Distributions on Evolutionary Optimization Algorithms* (GA)
César Galindo-Legaria, Florian Waas
- An Adaptive Penalty Scheme in Genetic Algorithms for Constrained Optimization Problems* (GA)
Helio Barbosa, Afonso Lemonge

MODELING AND REGRESSION FIFTH AVE. CHAIR: SIBYLLE MUELLER

A Two Level Evolutionary Modeling System for Financial Data (RWA)

Zhou Kang, Yan Li, Hugo De Garis, Li-Shan Kang

Symbolic Regression in Design of Experiments: A Case Study with Linearizing Transformations (RWA)

Flor Castillo, Kenric Marshall, James Green, Arthur Kordon

Application of Genetic Programming to Motorway Traffic Modelling (RWA)

Daniel Howard, Simon Roberts

MULTIOBJECTIVE GAS I PROMENADE CHAIR: CARLOS COELLO

Evaluation of the Constraint Method-Based Evolutionary Algorithm (CMEA) for a Three Objective Problem (GA)

Sujay Kumar, S. Ranji Ranjithan

An Enhanced Annealing Genetic Algorithm for Multi-objective Optimization Problems (GA)

Zhong-Yao Zhu, Kwong-Sak Leung

Why Quality Assessment of Multiobjective Optimizers Is Difficult (GA)

Eckart Zitzler, Marco Laumanns, Lothar Thiele, Carlos Foneseca, Viviane Grunert Da Fonseca

GA THEORY BROADWAY CHAIR: DARRELL WHITLEY

From Twomax to the Ising Model: Easy and Hard Symmetrical Problems (GA)

Clarissa Van Hoyweghen, David E. Goldberg, Bart Naudts

A Fixed Point Analysis of a Gene Pool GA with Mutation (GA)

Alden Wright, Jonathan Rowe, Riccardo Poli, Christopher Stephens

Exact Results from a Coarse Grained Formulation of the Dynamics of Variable-Length Genetic Algorithms (GA)

Christopher Stephens, Riccardo Poli, Alden Wright, Jonathan Rowe

LATE BREAKING PAPERS II RIVERSIDE CHAIR: ERIK GOODMAN

1:30 *A Novel Artificial Immune System Approach to Robust Data Mining*

Olfa Nasraoui, Dipankar Dasgupta, and Fabio Gonzalez

1:40 *Genetic Programming for Attribute Construction in Data Mining*

Fernando E. B. Otero, Monique M. S. Silva, and Alex A. Freitas

1:50 *Helping Computers Understand People*

Supiya Ujjin and Peter J. Bentley

2:00 *Learning Visual Feature Detectors for Obstacle Avoidance Using Genetic Programming*

Andrew J. Marek, William D. Smart, and Martin C. Martin

2:10 *An Improved Genetic Algorithm for the Inference of Finite State Machine*

Nattee Niparnan and Prabhas Chongstitvatana

2:20 *Fingerprint Matching by Genetic Algorithms*

Xuejun Tan and Bir Bhanu

2:30 *A Reversible Evolvable Network Architecture and Methodology to Overcome the Heat Generation Problem in Molecular Scale Brain Building*

Hugo de Garis, Jonathan Dinerstein, and Ravichandra Sriram

2:40 *TiPo – A New Dynamic Neural Net Model for Implementation in a Brain Building Machine*

Jonathan Dinerstein, Hugo de Garis, Sabra Dinerstein, and Nelson Dinerstein

2:50 *A Data Streaming Approach to Pattern Recognition with Evolvable Neural Networks*

Sabra Dinerstein, Jonathan Dinerstein, Hugo de Garis, and Nelson Dinerstein

Thursday July 11, 3:30pm – 5:30pm

AAAA/SBSE NOMINATED PAPERS TERRACE

CHAIRS: K. BALAKRISHNAN AND
J. WEGENER

- ★ *Intelligent Packets for Dynamic Network Routing Using Distributed Genetic Algorithm* (AAAA)
Suihong Liang, A. Nur Zincir-Heywood, Malcolm Heywood
- ★ *Dynamic Search with Charged Swarms* (AAAA)
T. M. Blackwell, P. J. Bentley
- ★ *Search Heuristics, Case-Based Reasoning and Software Project Effort Prediction*(SBSE)
Colin Kirsopp, Martin Shepperd, John Hart
- ★ *Improving Evolutionary Testing by Flag Removal* (SBSE)
Mark Harman, Lin Hu, Robert Hierons, Andre Baresel, Harmen Sthamer

EH/MPP NOMINATED PAPERS

BALLROOM

CHAIR: JULIAN MILLER

- ★ *A Modified Compact GA for the Intrinsic Evolution of Continuous Time Recurrent Neural Networks* (EH)
John Gallagher, Saranyan Vignanam
- ★ *Lens System Design and Re-Engineering with Evolutionary Algorithms* (EH)
Julie Beaulieu, Christian Gagné, Marc Parizeau
- ★ *Genetic Algorithms and Fine-Grained Topologies for Optimization* (MPP)
Xiaotong Wang, Lawrence Davis, Chunsheng Fu
- ★ *Evolutionary Computation as a Form of Organization*(MPP)
Alexander Kosorukoff, David E. Goldberg

ECI: EVOLUTIONARY ALGORITHMS AND BANKING APPLICATIONS

VANDERBILT

CHAIR: ZBIGNIEW MICHALEWICZ

An Approach to Producing Evolutionary Algorithms for the Banking Industry
Zbigniew Michalewicz, NuTech Solutions, Inc.

VDS: A Vehicle Distribution System
Martin Schmidt, NuTech Solutions, Inc.

MERIX: A Fraud Detection System
Tony Kaus, NuTech Solutions, Inc.

ARROW: A System for Routing Check and Mail Deliveries
Lawrence “David” Davis, NuTech Solutions, Inc.

GP METHODS

PLAZA

CHAIR: WOLFGANG BANZHAF

Abstention Reduces Errors--Decision Abstaining N-Version Genetic Programming (GP)
Kosuke Imamura, Robert Heckendorn, Terence Soule, James Foster

Structure Fitness Sharing (SFS) for Evolutionary Design by Genetic Programming(GP)
Jianjun Hu, K. Seo, Shaobo Li, Zhun Fan, Ronald Rosenberg, Erik Goodman

Size Control Via Size Fair Genetic Operators in the PushGP Genetic Programming System(GP)
Raphael Crawford-Marks, Lee Spector

Adaptive Hierarchical Fair Competition (AHFC) Model for Parallel Evolutionary Algorithms(GP)
Jianjun Hu, Erik Goodman, Kisung Seo, Min Pei

ANTS **FIFTH AVE.** **CHAIR: MARTIN MIDDENDORF**

Studies On the Dynamics of Ant Colony Optimization Algorithms (AAAA)
Daniel Merkle, Martin Middendorf

An Ant System Algorithm for Graph Bisection (AAAA)
Thang Bui, Lisa Strite

Ant Colony Optimization for the Edge -Weighted k -Cardinality Tree Problem(AAAA)
Christian Blum

Option Valuation with Generalized Ant Programming (AAAA)
Christian Keber, Matthias Schuster

GENETIC ALGORITHMS I **PROMENADE** **CHAIR: DIPANKAR DASGUPTA**

Simulating Gender Separation with Genetic Algorithms (GA)
Dana Vrajitoru

Exploring a Two-Market Genetic Algorithm (GA)
Steven Kimbrough, Ming Lu, David Harlan Wood, D. J. Wu

Isomorphism, Normalization, and a Genetic Algorithm for Sorting Network Optimiz ation (GA)
Sung-Soon Choi, Byung-Ro Moon

More Effective Genetic Search for the Sorting Network Problem (GA)
Sung-Soon Choi, Byung-Ro Moon

IMAGE ANALYSIS **BROADWAY** **CHAIR: BIR BHANU**

Hyperspectral Image Analysis Using Genetic Programming (RWA)
Brian Ross, Anthony Gualtieri, Frank Fueten, Paul Budkewitsch

An Evolution Strategies Based Approach to Image Registration (RWA)
Jian Zhang, Xiaohui Yuan, Bill Buckles

Learning Composite Operators for Object Detection(RWA)
Yingqiang Lin, Bir Bhanu

Machine Vision: Exploring Context with Genetic Programming (GP)
Daniel Howard, Simon Roberts, Conor Ryan

LATE BREAKING PAPERS III **RIVERSIDE** **CHAIR: CHARLES KARR**

3:30 *Genetic Algorithms: Airline Fleet Assignment Using Genetic Algorithm*
Tae-Cheol Jung and Joon Chung

3:40 *A Self-Tuning Evolutionary Algorithm for Inverse Partial Differential Equations*
Charles L. Karr and Eric L. Wilson

3:50 *Evolutionary Approach to Determining Critical Gust Loads on Aircraft Structures*
Charles L. Karr, Thomas A. Zeiler, and Rajiv Mehrotra

4:00 *A Real Coded Genetic Algorithm for the Optimisation of Reaction Rate Parameters for Chemical Kinetic Modelling in a Perfectly Stirred Reactor*
L. Elliott, D.B. Ingham, A.G. Kyne, N.S. Mera, M. Pourkashanian, and C.W. Wilson

4:10 *Engineering Applications of Harmony Search*
Zong Woo Geem and Chung-Li Tseng

4:20 *New Methodology, Harmony Search and Its Robustness*
Zong Woo Geem and Chung-Li Tseng

- 4:30 *Applying Evolution Strategies to a University Timetabling System*
Thomas B. George and ChanJin Chung
- 4:40 *Piston Pump Mobile Unity Tour Problem: An Evolutionary View*
Marco César Goldberg, Elizabeth Ferreira Gouvêa, and Francisco Dantas de M. Neto
- 4:50 *Programmatic Compression of Natural Video*
Thomas Krantz, Oscar Lindberg, Gunnar Thorburn, and Peter Nordin
- 5:00 *Structural Vibration Reduction Using Genetic Algorithm for Optimal Locations of Viscoelastic Dampers*
Hamid Movaffaghi and Olof Friberg
- 5:10 *A Step-by-Step Description of a Multi-Purpose Evolutionary Algorithm for Phylogenetic Tree Reconstruction*
Oclair G. Prado and Fernando J. Von Zuben

Friday July 12 Schedule at a Glance

	8:30 – 10:00	10:00 – 10:30	10:30 – 12:00	12:00 – 1:30	1:30 – 3:00	3:00 – 3:30	3:30 – 5:00
Terrace	LCS/GA Nominated ★	Break	Plenary talk: Computing with DNA and RNA, Laura Landweber	Lunch on your own	GA Nominated ★	Break	ES Nominated ★
Vanderbilt	ECI: Scheduling and Logistics				ECI: Design		ECI: Chemical Industry
Fifth Avenue	Machine Learning I				Machine Learning II		AAAA I
Riverside	Design with EAs				Learning Classifier Systems I		Learning Classifier Systems II
Broadway	Multiobjective GAs II				Search Based Software Eng I		Prediction and Detection
Lexington	Robotics ★				DNA Computation ★		Scheduling ★
Fashion	GP Hardware				Robustness		Resource Allocation
Americas	Late Breaking Papers				Late Breaking Papers		Late Breaking Papers

★ Denotes sessions with nominated papers. Remember to vote and return your ballot at the end of the day to the registration desk.

POSTER SESSION (7:00 – 10:00 PM)

TERRACE/PALM

Kluwer Academic Publishers provided support for this event and will have a special exhibit and book signing

Friday July 12, 8:30am – 10:00am

LCS/GA NOMINATED PAPERS I TERRACE CHAIR: BILL BUCKLES

- ★ *Hyper-Heuristics: Learning to Combine Simple Heuristics in Bin-Packing Problems* (LCS)
Peter Ross, Sonia Schulenburg, Javier Marín-Blázquez, Emma Hart
- ★ *Voronoi Quantized Crossover for Traveling Salesman Problem* (GA)
Dong-il Seo, Byung-Ro Moon
- ★ *A Permutation Genetic Algorithm for Variable Ordering in Learning Bayesian Networks from Data* (GA)
William Hsu, H. Guo, B. Perry, J. Stilson

EVOLUTIONARY ROBOTICS LEXINGTON CHAIR: MITCH POTTER

- ★ *Creation of a Learning, Flying Robot by Means of Evolution* (ROB)
Peter Augustsson, Peter Nordin, Krister Wolff
- Learning Area Coverage Using the Co-Evolution of Model Parameters* (ROB)
Gary Parker

ECI: SCHEDULING AND LOGISTICS VANDERBILT CHAIR: GRAHAM KENDALL

- A Quick Introduction to Scheduling with Evolutionary Algorithms*
Peter Ross, Napier University
- So You Want to Build an Automated Scheduling System?*
David Montana, BBN Technologies
- Developing Scheduling Software Using Genetic Algorithms in a Commercial Environment*
Stephen Ottner, Pilat Media
- Panel Discussion*
Panel consisting of the three speakers; discussion led by Graham Kendall, The University of Nottingham

MACHINE LEARNING/DATA MINING I FIFTH AVE. CHAIR: JULIO NIEVOLA

- Feature Subset Selection by Estimation of Distribution Algorithms* (GA)
Erick Cantú-Paz
- Evolutionary Concept Learning* (GA)
Federico Divina, Elena Marchiori
- Fuzzy Rule Selection by Data Mining Criteria and Genetic Algorithms* (GA)
Hisao Ishibuchi, Takashi Yamamoto

DESIGN WITH EAs RIVERSIDE CHAIR: FRANZ ROTHLAUF

- Designing Crushers with a Multi-Objective Evolutionary Algorithm* (RWA)
L. Barone, L. While, P. Hingston
- Multi-Objective Optimisation of Rolling Rod Product Design Using Meta-Modelling Approach* (RWA)
V. Oduguwa, R. Roy
- Design Optimization of N-Shaped Roof Trusses* (RWA)
K. Hamza, H. Mahmoud, K. Saitou

MULTIOBJECTIVE GAs II**BROADWAY****CHAIR: CARLOS COELLO***Fitness Inheritance in Multi-Objective Optimization (GA)*

Jian-Hung Chen, David E. Goldberg, Shinn-Ying Ho, Kumara Sastry

Why Use Elitism and Sharing in a Multi-Objective Genetic Algorithm? (GA)

Robin Purshouse, Peter Fleming

MOCS: Multi-Objective Clustering Selection Evolutionary Algorithm (GA)

Thomas Koch, Andreas Zell

GP HARDWARE**FASHION****CHAIR: LEE SPECTOR***Crossover Operators for a Hardware Implementation of Genetic Programming Using FPGAs and Handel-C (GP)*

Peter Martin, Riccardo Poli

An Analysis of Random Number Generators for a Hardware Implementation of Genetic Programming Using FPGAs and Handel-C (GP)

Peter Martin

Iterative Refinement of Computational Circuits Using Genetic Programming (GP)

Matthew Streeter, Martin Keane, John Koza

LATE BREAKING PAPERS IV**AMERICAS****CHAIR: SEAN LUKE**8:30 *Solving Approximation Problems by Ant Colony Programming*

Mariusz Boryczka and Zbigniew J. Czech

8:40 *An Ant Colony Algorithm for Steiner Trees: New Results*

Sanjoy Das, Shekhar V. Gosavi, William H. Hsu, and Shilpa A. Vaze

8:50 *An Ant Colony Algorithm for the Restoration of Distribution Systems*

Indira Mohanty, Sanjoy Das, Anil Pahwa, Jugal K. Kalita, and Shekhar V. Gosavi

9:00 *Modified Linkage Learning Genetic Algorithm for Difficult Non-Stationary Problems*

Abhishek Singh, David E. Goldberg, and Ying-Ping Chen

9:10 *Length Variation in Response to a Changing Environment*

Annie S. Wu, Han Yu, Kuo-Chi Lin, and Guy Schiavone

9:20 *An Imanishian Genetic Algorithm: An Application to the Module Placement Problem*

Kiyoharu Tagawa, Hiromasa Haneda, and Koji Mizutani

9:30 *Stack-Correct Crossover Methods in Genetic Programming*

Elko Tchernev

9:40 *NCGA: Neighborhood Cultivation Genetic Algorithm for Multi-Objective Optimization Problems*

Shinya Watanabe, Tomoyuki Hiroyasu, and Mitsunori Miki

Friday July 12, 10:30am – 12:00pm

KEYNOTE TALK

TERRACE

Computing with DNA and RNA, in vivo and in vitro

Laura F. Landweber
Princeton University

Inspired by examples of biological computation, it has recently been possible to design molecular “computers” to solve a wide class of mathematical search problems. I will describe the process of gene unscrambling in ciliates, involving extensive DNA recombination and rearrangement, as an illustration of DNA computing in a microbial cell. I will then describe our construction of an RNA computer to solve an instance of a satisfiability problem derived from chess.

Laura Landweber (lfl@princeton.edu) received her A.B. from Princeton University summa cum laude in Molecular Biology in 1989 and her Ph.D. from Harvard University in Biology from the Department of Cellular and Developmental Biology in 1993. She was a Junior Fellow of the Harvard University Society of Fellows from 1993-1994 and then returned to Princeton in 1994, where she is an Associate Professor in the Department of Ecology & Evolutionary Biology. A recipient of a Burroughs-Wellcome Fund and Sigma Xi Young Investigator Awards, her research spans the interplay between molecular biology, computer science, combinatorial chemistry, and evolution.

Friday July 12, 1:30pm – 3:00pm

GA NOMINATED PAPERS II

TERRACE

CHAIR: STEPHANIE FORREST

- ★ *A Comparison of Two Competitive Fitness Functions* (GA)
Liviu Panait, Sean Luke
- ★ *Efficient Reinforcement Learning through Evolving Neural Network Topologies* (GA)
Kenneth Stanley, Risto Miikkulainen
- ★ *Archiving with Guaranteed Convergence and Diversity in Multi-Objective Optimization* (GA)
Marco Laumanns, Lothar Thiele, Eckart Zitzler, Kalyanmoy Deb

DNA COMPUTATION

LEXINGTON

CHAIR: NATASHA JONOSKA

- ★ *A DNA -based Three-State Device* (DNA)
Bernard Yurke, Friedrich Simmel
- Algorithmic Self-Assembly of DNA Tiles and its Application to Cryptanalysis* (DNA)
Olivier Pelletier, Andre Weimerskirch
- Generating DNA Code Words*
Natasa Jonoska, David Kephart, and Kalpana Mahalingam

ECI: EAs AND DESIGN

VANDERBILT

CHAIR: MARK JAKIELA

- Optimal Design of Laminate Composites*
Mark Jakiela et al., Washington University and Boeing Corporation
- Optimal Piezoceramic Actuator Placement for Buffet Load Alleviation*
Mark Jakiela et al., Washington University and Boeing Corporation
- Antenna Design Using Genetic Algorithms*
Derek S. Linden, Linden Innovation Research
- What to do When Your Genetic Algorithm Does Not Work?*
Matthew Wall, Oculus Technologies Corporation

MACHINE LEARNING/DATA MINING II

FIFTH AVE.

CHAIR: MARC SCHOENAUER

- Balancing Learning and Evolution* (GA)
Michael Hüskens, Christian Igel
- Applying Genetic Algorithms to Finding the Optimal Gene Order in Displaying the Microarray Data* (GA)
Huai-Kuang Tsai, Jinn-Moon Yang, Cheng-Yan Kao
- A Genetic Algorithm for Discovering Interesting Fuzzy Prediction Rules: Applications to Science & Technology* (RWA)
Wesley Romao, Alex Freitas, Roberto Pacheco

LEARNING CLASSIFIER SYSTEMS I RIVERSIDE

CHAIR: LARRY BULL

- Coevolving Different Knowledge Representations with Fine-Grained Parallel Learning Classifier Systems* (LCS)
Xavier Llorca, Josep Garrell
- Lookahead and Latent Learning in ZCS* (LCS)
Larry Bull
- A Modified Classifier System Compaction Algorithm* (LCS)
Chunsheng Fu, Lawrence Davis

SEARCH-BASED SOFTWARE ENGINEERING I**BROADWAY****CHAIR: JOACHIM WEGENER***GPTesT: a Testing Tool Based on Genetic Programming (SBSE)*

Vergilio Silvia, Maria Claudia Figueiredo Pereira Emer, Silva Regina Vergilio

Fitness Function Design to Improve Evolutionary Structural Testing (SBSE)

Andre Baresel Harmen Sthamer, Michael Schmidt

Instrumenting Programs with Flag Variables for Test Data Search by Genetic Algorithms (SBSE)

Leonardo Bottaci

ROBUSTNESS**FASHION****CHAIR: KEITH MATHIAS***Increasing Robustness of Genetic Algorithm (GA)*

Jiangming Mao, Kotaro Hirasawa, Jinglu Hu, Junichi Murata

Robust Evolutionary Algorithms with Toroidal Search Space Conversion for Function Optimization (GA)

Hiroshi Someya, Masayuki Yamamura

Maintaining Population Diversity by Minimizing Mutual Information (GA)

Yong Liu, Xin Yao

LATE BREAKING PAPERS V**AMERICAS****CHAIR: KUMARA SASTRY**1:30 *A Multiscale Master-Slave Parallel Genetic Algorithm with Application to Groundwater Remediation Design*

Meghna Babbar and Barbara S. Minsker

1:40 *Enhancing Tournament Selection to Prevent Code Bloat in Genetic Programming*

Flavio Baronti and Antonina Starita

1:50 *Evolving Fractal Proteins*

Peter J. Bentley

2:00 *Evolving Green Buildings*

David A. Coley

2:10 *A Minimal Bidding Application (with Slack Time) Solved by a Genetic Algorithm where Element Costs Are Time Dependent*

Joseph DeCicco, Michael L. Gargano, and William Edelson

2:20 *The Role of Genetic Programming in Describing the Microscopic Structure of Hydrating Plaster*

Judith E. Devaney and John G. Hagedorn

2:30 *Using Linkage Learning for Forest Management Planning*

Els I. Ducheyne, Robert R. De Wulf, and Bernard De Baets

2:40 *Evolving Software with Multiple Outputs and Multiple Populations*

John Hart and Martin Shepperd

Friday July 12, 3:30pm – 5:00pm

EVOLUTION STRATEGIES

TERRACE

CHAIR: TBA

- ★ *An Analysis of the Role of Offspring Population Size in EA's* (ES)
Thomas Jansen, Kenneth De Jong
- ★ *On the Convergence Properties of a Simple Self-Adaptive Evolutionary Algorithm* (ES)
John Delaurentis, Lauren Ferguson, William Hart
- ★ *On the Dynamics of Evolutionary Multi-Objective Optimization* (ES)
Tatsuya Okabe, Yaochu Jin, Bernhard Sendhoff

SCHEDULING

LEXINGTON

CHAIR: GRAHAM KENDALL

- ★ *A Savings Based Ant System for the Vehicle Routing Problem* (SCH)
Marc Reimann, Michael Stummer, Karl Doerner
- Balance Between Genetic Search and Local Search in Hybrid EMO Algorithms* (SCH)
Hisao Ishibuchi, Tadashi Yoshida, Tadahiko Murata
- A Hybrid Genetic Algorithm for the Vehicle Routing Problem with Time Windows* (SCH)
Soonchul Jung, Byung-Ro Moon

ECI: EAs AND THE CHEMICAL INDUSTRY

VANDERBILT

CHAIR: MARK KOTANCHEK

- Evolutionary Computing in Dow Chemical*
Mark Kotanchek et al, the Dow Chemical Company
- Accelerating Industrial Fundamental Model Building with Symbolic Regression: A Case Study with Structure - Property Relationships*
Arthur Kordon et al. Presented by Mark Kotanchek, the Dow Chemical Company
- Designing Targeted Combinatorial Libraries by Genetic Algorithm*
Robert P. Sheridan, Merck Research Laboratories
- Cellular Programming and Bioware: Computer Evolution of Gene Circuits to Reprogram Living Cells*
Tommaso F. Bersano Begey, University of Michigan

LEARNING CLASSIFIER SYSTEMS RIVERSIDE

CHAIR: PIER LUCA LANZI

- A Comparison Between ATNoSFERES and XCSM* (LCS)
Samuel Landau, Sebastien Picault, Oliver Sigaud, Pierre Gerard
- Accuracy-based Neuro and Neuro-Fuzzy Classifier Systems* (LCS)
Larry Bull, Toby O'Hara
- XCS Applied to Mapping FPGA Architectures* (LCS)
Robert Smith, Martin Danek

PREDICTION AND DETECTION

BROADWAY

CHAIR: MARC SCHOENAUER

- Grammatical Evolution and Corporate Failure Prediction*(RWA)
Michael O'Neill, Anthony Brabazon, Robin Matthews, Conor Ryan
- Improving Digital Video Commercial Detectors with Genetic Algorithms* (RWA)
J. David Schaffer, Lalitha Agnihotri, Nevenka Dimitrova, Thomas McGee, Sylvie Jeannin
- The Evolution of Variable Learning Rates* (AAAA)
John A. Bullinaria

IMMUNE SYSTEMS**FIFTH AVE.****CHAIR: D. DASGUPTA**

An Immunogenetic Technique to Detect Anomalies in Network Traffic (RWA)
Fabio Gonzalez, Dipankar Dasgupta

Coverage and Generalization in an Artificial Immune System (AAAA)
Justin Balthrop, Fernando Esponda, Stephanie Forrest, Matthew Glickman

On the Use of Negative Selection in an Artificial Immune System (MPP)
Marc Ebner, Hans-Georg Breunig, Juergen Albert

RESOURCE ALLOCATION**FASHION****CHAIR: DAVID SCHAFFER**

Using Genetic Algorithms to Solve the Yard Allocation Problem (RWA)
Ping Chen, Zhaohui Fu, Andrew Lim

Genetic Search for Fixed Channel Assignment Problem with Limited Bandwidth (RWA)
Eun-Jong Park, Yong-Hyuk Kim, Byung-Ro Moon

An Application Service Provider Approach for Hybrid Evolutionary Algorithm-based Real-world Flexible Job Shop Scheduling Problem (RWA)
Ivan Tanev, Takashi Uozumi, Y. Morotome

LATE BREAKING PAPERS VI**AMERICAS****CHAIR: CONOR RYAN**

3:30 *Natural Evolutionary Coding: An Application to Estimating Software Development Projects*
Jesús S. Aguilar-Ruiz, José C. Riquelme, and Isabel Ramos

3:40 *Evolutionary Testing in Component-Based Real-Time System Construction*
Hans-Gerhard Groß and Nikolas Mayer

3:50 *Manipulating Valid Solutions in a Genetic Algorithm for the Bounded-Diameter Minimum Spanning Tree Problem*
Bryant A. Julstrom

4:00 *A New Model to Realize Variable Size Genetic Network Programming – A Case Study with the Tileworld Problem*
Hironobu Katagiri, Kotaro Hirasawa, Jinglu Hu, and Junichi Murata

4:10 *An Evolvable Hardware Platform Based on DSP and FPTA*
M.I. Ferguson, R. Zebulum, D. Keymeulen, and A. Stoica

4:20 *Using Competitive Operators and a Local Selection Scheme in Genetic Search*
Jonathan Gomez and Dipankar Dasgupta

4:30 *A Kernighan-Lin Local Improvement Heuristic that Softens Some Hard Problems in Genetic Algorithms*
William A. Greene

4:40 *Controlled Genetic Programming Search for Solving Deceptive Problems*
Emin Erkan Korkmaz and Göktürk Üçoluk

Friday July 12, 7:00 – 10:00pm

POSTER SESSION AND RECEPTION TERRACE/PALM

The poster session is open to all registered GECCO attendees, who are welcomed to discuss the research with the authors of each poster. A one-page abstract of each poster presentation is included in the published GECCO proceedings.

An assortment of desserts will be available along with coffee service and a cash bar.

Please remember to wear your GECCO admission badge; it is your pass to enter the poster session and reception.

Instructions to Poster Presenters

The time for preparing posters for display is during the coffee breaks and lunch period Friday in the Terrace/Palm rooms. There will be tables placed in the back of the rooms for this. Please stop working in your poster before the sessions start in the Terrace and Palm rooms to avoid causing delays in the oral presentations. One 30"x40" foam core poster board will be provided for each accepted poster paper. Push pins and glue sticks will be available. Once your poster is mounted, you may leave it in the Terrace and Palm rooms. Please return at 6:45pm at the latest to put your mounted poster on an easel at a position of your choice in the perimeter of the Terrace/Palm rooms.

The poster session will begin promptly at 7:00pm. Please feel free to enjoy the reception at this time. At 7:30pm, please go to and remain by your poster until 8:00pm to discuss or answer questions about your poster.

If you wish to keep your poster presentation, please remove it from the poster board sometime between 10:00 and 10:30pm Friday evening. We are not responsible for items left after this time.

If you have any further questions, please ask the AAAI staff at the GECCO registration desk, or in advance by email to gecco@aaai.org.

Kluwer Academic Publishers Co-Sponsors this Reception

Kluwer Academic Publishers will host a special exhibit of the Genetic Programming and Evolvable Machines journal, the Genetic Programming book series, and the Genetic Algorithms and Evolutionary Computation book series. The exhibit will feature David E. Goldberg's new book, "The Design of Innovation", plus other eight other recently published books in his series. Many of the authors will be on hand to sign their books.

Saturday July 13 Schedule at a Glance

	8:30 – 10:00	10:00 – 10:30	10:30 – 12:00	12:00 – 1:30	1:30 – 3:00	3:00 – 3:30	3:30 – 5:30
Broadway	ISGEC Business Meeting – Terrace (all are welcome to attend)	Break	GP Theory	Lunch on your own	SBSE II	Break	Crossover and Linkage
Fifth Avenue			GA Misc.		GP Applications		Applications
Riverside			Multiobjective Design		Evolvable Hardware		Particle Swarm Optimization
Sutton			Approximations		AAAA		Design w/ EAs II
Terrace			Crossover and Linkage		Machine Learning III		GA Parameters Convergence
Vanderbilt			ECI: Experts in Action		Agents		GP Apps/MPP
York			Late Breaking Papers		Late Breaking Papers		

Saturday July 13, 8:30am – 10:00am

ISGEC BUSINESS MEETING

TERRACE

CHAIR: ERIK GOODMAN

All registered GECCO attendees are welcome to this meeting where the status and activities of the International Society for Genetic and Evolutionary Computation will be reported.

Saturday July 13, 10:30am – 12:00pm

ECI: EA EXPERTS IN ACTION

VANDERBILT

CHAIR: RAJKUMAR ROY

Conference attendees will meet in parallel discussions with expert practitioners to discuss problems that may be amenable to high-payoff solution by evolutionary algorithms. Session attendees will be invited to gravitate to the discussions that seem most interesting to them. Experts participating in these interactions will be Mark Jakiela, Peter Ross, Matthew Wall, Wendy Williams, Martin Schmidt, Rajkumar Roy, and Lawrence Davis. (We anticipate that the list of experts will be longer by the time of the conference.) Problems for consideration will be provided on the spot by conference attendees.

CROSSOVER AND LINKAGE I

TERRACE

CHAIR: GARY B. LAMONT

Variable Dependence Interaction and Multi-Objective Optimization (GA)
Ashutosh Tiwar, Rajkumar Roy

A Genetic Algorithm with Self -Distancing Bits But No Overt Linkage (GA)
William Greene

Adaptive Non -Uniform Crossover Based on Statistics for Genetic Algorithms (GA)
Shengxiang Yang

APPROXIMATIONS

SUTTON

CHAIR: KHALED RASHEED

Fitness Approximation in Evolutionary Computation - A Survey (RWA)
Yaochu Jin, Bernhard Sendhoff

Comparison of Methods for Using Reduced Models to Speed Up Design Optimization (RWA)
Khaled Rasheed, Swaroop Vattam, Xiao Ni

Efficient Discretization Scheduling in Multiple Dimensions (GA)
Laura Albert, David E. Goldberg

GENETIC ALGORITHMS

FIFTH AVE.

CHAIR: DAVID COLEY

How Random Generator Quality Impacts GA Performance (GA)
Mark Meysenburg, James Foster, Daniel Hoelting, Duane McElvain

On Random Numbers and the Performance of Genetic Algorithms (GA)
Erick Cantú-Paz

Eugenic Evolution Utilizing a Domain Model (GA)
Matthew Alden, A. J. Van Kesteren, Risto Miikkulainen

GP THEORY**BROADWAY****CHAIR: RICCARDO POLI**

Convergence Rates for the Distribution of Program Outputs (GP)
W. B. Langdon

Using Schema Theory to Explore Interactions of Multiple Operators (GP)
Nicholas McPhee, Riccardo Poli

Lexicographic Parsimony Pressure (GP)
Sean Luke, Liviu Panait

MULTIOBJECTIVE DESIGN**RIVERSIDE****CHAIR: MARCO LAUMANN**

Exploring Multiple Design Topologies Using Genetic Programming and Bond Graphs (RWA)
Zhun Fan, Kisung Seo, Ronald Rosenberg, Jianjun Hu, Erik Goodman

Multi Objective Airfoil Design Using Single Parent Populations (RWA)
Boris Naujoks, Werner Haase, Jorg Ziegenhirt, Thomas Back

An Adaptive Genetic Algorithm for Multi Objective Flexible Manufacturing Systems (RWA)
Abdulnaser Younes, Hamada Ghenniwa, Shawki Areibi

LATE BREAKING PAPERS VII**YORK****CHAIR: S. SCHULENBURG**

10:30 *PLANTWORLD: Population Dynamics in Contrasting Environments*
Jacqueline R. Dyer and Peter J. Bentley

10:40 *Population Genetics of Regulatory Genes: a Genetic Algorithm Model*
Gregory A. Holifield and Annie S. Wu

10:50 *The Basic Study of Artificial Ecosystem Models Using Network -Type Assembly -Like Language*
Yuhki Shiraishi, Kotaro Hirasawa, Jinglu Hu, and Junichi Murata

11:00 *Case Studies on the Evolutionary Synthesis of Computational Circuits, Filters and Complete Fuzzy Systems*
Ricardo S. Zebulum, Xin Guo, Adrian Stoica, Didier Keymeulen, and M. I. Ferguson

11:10 *Adapting Search Strategies to Induced Fitness Landscapes*
Terry P. Riopka

11:20 *Using Genetic Programming with Multiple Data Types and Automatic Modularization to Evolve Decentralized and Coordinated Navigation in Multi-Agent Systems*
Alan Robinson and Lee Spector

11:30 *Studying the Emergence of Multicellularity with Cartesian Genetic Programming in Artificial Life*
Joseph A. Rothermich and Julian F. Miller

11:40 *k-Tablet Structures and Crossover on Latent Variables for Real-Coded GA*
Jun Sakuma and Shigenobu Kobayashi

Saturday July 13, 1:30pm – 3:00pm

MACHINE LEARNING/DATA MINING III TERRACE CHAIR: TBA

A Genetic Algorithm with Sequential Niching for Discovering Small -Disjunct Rules (GA)
Alex Freitas, Deborah Carvalho

A Hybrid Data Mining Approach to Discover Bayesian Networks Using Evolutionary Programming (GA)
Wong Man, Leung Shing Yan Lee, Kwong Sak Leung

Learning in Robocup Keepaway Using Evolutionary Algorithms (RWA)
Anthony Di Pietro, Lyndon While, Luigi Barone

A-LIFE, ADAPTIVE BEHAVIOR, AGENTS SUTTON CHAIR: TBA

Continual Coevolution through Complexification (AAAA)
Kenneth Stanley, Risto Miikkulainen

A Racing Algorithm for Configuring Metaheuristics (AAAA)
Mauro Birattari, Thomas Stützle, Luis Paquete, Klaus Varrentrapp

On a Particularity in Model-Based Search (AAAA)
Christian Blum, Michael Sampels, Mark Zlochin

AGENTS VANDERBILT CHAIR: K. BALAKRISHNAN

Agent Support of Genetic Search in an Immunological Model of Sparse Distributed Memory (AAAA)
Keith Mathias, Jason Byassee

Effects of Agent Representation on the Behavior of a Non -Reciprocal Cooperating Game(AAAA)
Nicole Leahy

Cross-Validation in Multiagent-Based Simulation: Analyzing Evolutionary Bargaining Agents (AAAA)
Keiki Takadama, Yutaka Suematsu, Norberto Nawa, Katsunori, Shimohara

GP APPLICATIONS I FIFTH AVE. CHAIR: TBA

Breeding Algebraic Structures - An Evolutionary Approach to Inductive Equational Logic Programming (GP)
Lutz Hamel

Inference of Differential Equation Models by Genetic Programming (GP)
Hitoshi Iba, Erina Sakamoto

Evolving Compression Preprocessors with Genetic Programming(GP)
Johan Parent, Ann Nowe, Katja Verbeeck

SEARCH BASED SOFTWARE ENG. II BROADWAY CHAIR: MARK HARMAN

A New Representation and Crossover Operator for Search-Based Optimization of Software Modularization (SBSE)
Mark Harman, Robert Hierons, Mark Proctor

Code Factoring and the Evolution of Evolvability (SBSE)
Terry Van Belle, David H. Ackley

Using Heuristic Search Techniques to Extract Design Abstractions From Source Code(SBSE)
Brian Mitchell, Spiros Mancoridis

EVOLVABLE HARDWARE**RIVERSIDE****CHAIR: JULIAN MILLER**

An Evolvable Micro-Controller or What's New About Mutations? (EH)
Uwe Tangen

Achieving Fault Tolerance on an Unreliable Technology Platform (EH)
Morten Hartmann, Frode Eskelund, Pauline Haddow, Julian Miller

Antenna Design Using Genetic Algorithm (RWA)
Derek Linden

LATE BREAKING PAPERS VIII**YORK****CHAIR: GUSTAVO OLAGUE**

1:30 *Recent Results from the Experimental Evaluation of the Learnable Evolution Model*
Guido Cervone, Kenneth A. Kaufman, and Ryszard S. Michalski

1:40 *Using Evolutionary Computation for Automated Sensor Planning*
Enrique Dunn and Gustavo Olague

1:50 *Multiagent Systems with Symbiotic Learning and Evolution Using Genetic Network Programming*
Toru Eguchi, Kotaro Hirasawa, Jinglu Hu, and Junichi Murata

2:00 *Evolving Neural Network Architectures, Activation Functions and Learning Algorithms*
Patrick M. Haluptzok

2:10 *An Experimental Comparison of Genetic and Classical Concept Learning Methods*
Gabriella Kókai, Zoltán Tóth, and Szilvia Zvada

2:20 *Constructing X-of-N Attributes with a Genetic Algorithm*
Otavio Larsern, Alex A. Freitas, and Julio C. Nievola

Saturday July 13, 3:30pm – 5:00pm

GA PARAMETERS AND CONVERGENCE**TERRACE****CHAIR: KENNETH DE JONG**

A Simple Method for Detecting Domino Convergence and Identifying Salient Genes Within a GA (GA)
Hal Stringer, Annie S. Wu

Strategy Parameter Variety in Self-adaptation of Mutation Rates (GA)
Jim Smith, Christopher Stone

Setting the Mutation Rate: Scope and Limitations of the 1/L Heuristic (GA)
Gabriela Ochoa

GP APPLICATIONS AND MPP**VANDERBILT****CHAIR: ROBERT E. SMITH**

Evolving Chess Playing Programs (GP)
R. Gross, K. Albrecht, W. Kantschik, W. Banzhaf

Collaborating with a Genetic Programming System to Generate Modular Robotic Code (GP)
Jeremy Kubica, Eleanor Rieffel

The Turing Ratio: Measuring Progress toward Intelligent Behavior (MPP)
Hassan Masum, Steffen Christensen, Franz Oppacher

APPLICATIONS**FIFTH AVE.****CHAIR: BYUNG-RO MOON**

Voice Conversion Using Interactive Evolution of Prosodic Control (RWA)
Yuji Sato

Automatic Test Data Generation for Structural Testing of Embedded Software by Evolutionary Testing (RWA)
Joachim Wegener, Kerstin Buhr, Hartmut Pohlheim

Search Improvement by Genetic Algorithms with a Semiotic Network (RWA)
Sang-Yon Lee, Sung-Soon Choi, Byung-Ro Moon

CROSSOVER AND LINKAGE II**BROADWAY****CHAIR: DAVID E. GOLDBERG**

The Point of Point Crossover: Shuffling to Randomness (GA)
Anil Menon

A Comparison of Memetic Recombination Operators for the Traveling Salesman Problem (GA)
Peter Merz

Partnering Strategies for Fitness Evaluation in a Pyramidal Evolutionary Algorithm (GA)
Uwe Aickelin, Larry Bull

PARTICLE SWARM OPTIMIZATION**RIVERSIDE****CHAIR: PETER BENTLEY**

Adaptive Control Utilizing Neural Swarming (AAAA)
Alex Conradie, Risto Miikkulainen, Christiaan Aldrich

Practical Swarm Optimization Applied to the Atomic Cluster Optimization Problem (AAAA)
R. J. W. Hodgson

A New Methodology for Emergent System Identification Using Particle Swarm Optimization (PSO) and the Group Method Data Handling (GMDH) (RWA)
Mark Voss, Xin Feng

ISGEC Membership Application

BASIC INFO

First Name: _____ Last Name: _____

Address: _____

City: _____ State/Province: _____

Postal/Zip Code: _____

Country: _____

Email Address: _____

Daytime Telephone: _____ Fax Number: _____

MEMBERSHIP TYPE (check one)

Student Membership (US \$50/year for registered full-time students, enclose a copy of student identification card or other documentation)

Regular Individual Membership (US \$120/year)

PAYMENT INFO (check one)

Enclose a check payable to ISGEC, and send to:
International Society for Genetic and Evolutionary Computation
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Stanford, CA 94309

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(please be sure that your name and address are those registered with your credit card)

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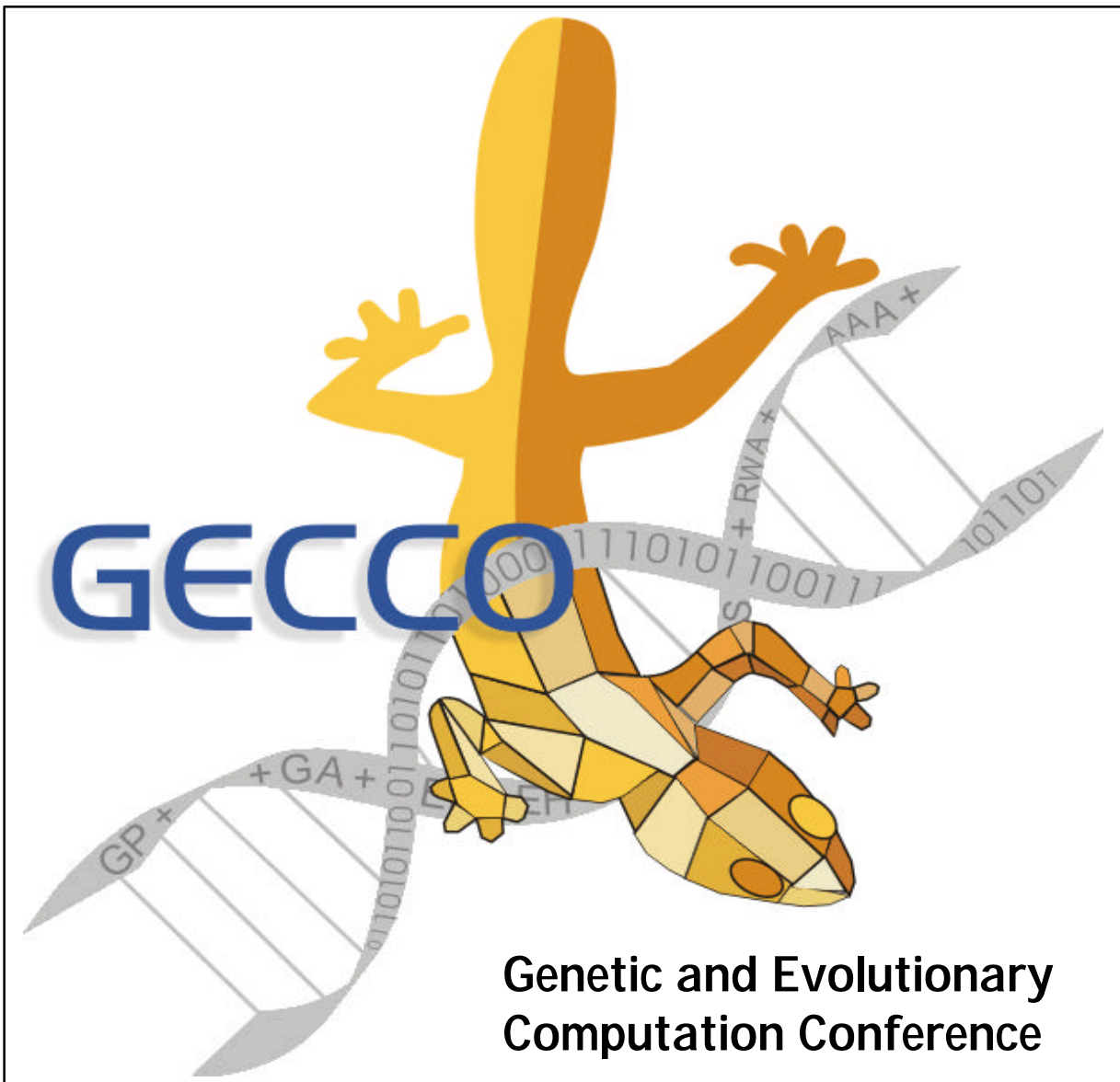
Expiration Date (month/year): _____

Signature Required: _____

If you are not joining ISGEC at GECCO, you may send this form by mail (if paying by check or credit card) to ISGEC, PO Box 19656, Stanford, CA 94039, USA. You may instead join online, using Pay-Pal at www.isgec.org

Remember that ISGEC membership entitles you to discounts in the GECCO registration fee (if you join ISGEC *before* paying your 2002 registration you can get the discount this year). Your membership also includes annual subscriptions to the journals *Evolutionary Computation* and *Genetic Programming and Evolvable Machines*.

Plan to Attend the Next GECCO



GECCO – 2003

Chicago, IL

July 12-16, 2003 (Saturday-Wednesday)

www.isgec.org/GECCO-2003