CONFERENCE PROGRAM

June 26 – 30, 2004
Red Lion Hotel on Fifth Avenue
Seattle, Washington, USA

A Recombination of the Ninth Annual Genetic Programming Conference and the
Thirteenth 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

Friday, June 25: 17:00–19:00; **Saturday,** June 26: 7:00–17:00; **Sunday,** June 27: 7:30–17:00; **Monday – Tuesday**, June 28–29: 8:00–17:00; **Wednesday**, June 30: 8:00–12:00**. The registration will take place in the foyer on the 3rd Floor.**

Exhibits

Visit the exciting exhibits from Kluwer Academic Publishers and Springer Verlag located in the foyer on the 3rd Floor. Exhibition times are 13:00 – 17:30 on Saturday, June 26; 8:30 – 17:30 Sunday through Tuesday, June 27–29; and 8:30 – 13:30 on Wednesday, June 30 (or as posted in the foyer on the 3rd Floor).

Instructions for Presenters and Session Chairs

Talks in the regular technical sessions, Monday through Wednesday, are scheduled for *25 minutes*. This includes 20 minutes of presentation and 5 minutes of questions. **Late Breaking Paper (LBP) talks** should take no more than *15 minutes* total (12 minutes of presentation with 3 minutes of questions). Set-up of necessary presentation equipment should be calculated into the allotted presentation time. **Posters** set-up time is Tuesday June 29: 14:00–17:00. The poster boards are fabric-covered, 4'×6' (1.22m×1.83m), landscape. Push pins and Velcro will be provided.

The **duties of session chairs** are: Keep the session on schedule, introduce speakers, and moderate the question portion. Session chairs should arrive a few minutes early to check on room and equipment set-up. Please let conference organizers know immediately if problems arise or adjustments are needed. Please adhere to the scheduled order of talks as well as presentation times. If a speaker is absent, we ask you to announce a short break until the next presentation is due to start. Do not start early, as participants may be moving between sessions/presentations.
If a session is without a chair, we ask the last scheduled speaker to perform those duties.

Wireless Internet and Chat Room

Wireless (802.11b) **internet** is available **free** for all GECCO attendees throughout the Red Lion hotel (wired high-speed internet is also available in guest rooms), but *you need to have your own laptop*. If you have wireless Internet installed, your laptop will find the Red Lion network. Open your Web browser and you are in. If your laptop does not have a wireless card you may be able to borrow one from the GECCO registration desk or from the front desk.

Emerald III will be available throughout the conference as an area where you can **use your laptop** without disturbing presentations or where **people can meet and talk** (poster paper and easels are available for you to use while you chat).

GECCO-2004 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

CONFERENCE CHAIR: Riccardo Poli

PROCEEDINGS EDITOR-IN-CHIEF: Kalyanmoy Deb

BUSINESS COMMITTEE: David E. Goldberg, John R. Koza and Riccardo Poli

WORKSHOPS CHAIR: Stefano Cagnoni

COMPETITIONS CHAIR: Simon Lucas

LOCAL ARRANGMENTS CHAIR: Mike Cattolico

PUBLICITY CHAIR: John Koza

LATE–BREAKING PAPERS (LBP) CHAIR: Maarten Keijzer

EVOLUTIONARY COMPUTATION IN INDUSTRY (ECI): David Davis, Rajkumar Roy and Mark Jakiela

GRADUATE STUDENT WORKSHOP: Terry Riopka

PROGRAM TRACKS AND CHAIRS:

Genetic Programming (GP): Lee Spector
Genetic Algorithms (GA): Dirk Thierens
Evolution Strategies, Evolutionary Programming (ES): Hans-Georg Beyer
Real World Applications (RWA): Andrea Tettamanzi
Learning Classifier Systems (LCS): Pier Luca Lanzi
Evolvable Hardware (EHard): Andy Tyrrell
Biological Applications (BioApp): James A. Foster and Wolfgang Banzhaf
A-Life, Adaptive Behavior, Agents and Ant Colony Optimization (AAAA): Owen Holland
Evolutionary Robotics (EvRob): Dario Floreano
Evolutionary Scheduling and Routing: Edmund Burke
Search Based Software Engineering (SBSE): Mark Harman
Coevolution (Coev): Paul Darwen
Artificial Immune Systems (AIS): Dipankar Dasgupta

ADMINISTRATIVE ASSISTANCE: Ann Stolberg and Carol Hamilton

SUPPORT FOR STUDENT TRAVEL DONATED BY:

Tiger Mountain Scientific
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SPECIAL THANKS: Pat Cattolico, Erick-Cantu Paz, Erik Goodman, Alfred Hofmann, Gerardo Valencia, Caterina Cinel, the University of Essex.

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Supiya Ujjin
Steven van Dijk
Jano van Hemert
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Oswaldo Velez-Langs
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Roger Wainwright
Matthew Wall
Harold Wareham
Jean-Paul Watson
Everett Weber
Ingo Wegener
Karsten Weicker
Peter Whigham
Shimon Whiteson
Darrell Whitley
R. Wiegand
Stewart Wilson
Mark Wineberg
Alden Wright
Annie Wu
Zheng Wu
Jinn-Moon Yang
Tina Yu
Hongnian Yu
Ricardo Zebulum
Andreas Zell
Byoung-Tak Zhang
Gengui Zhou
Fan Zhun
Tom Ziemke
Lyudmilla Zinchenko
Eckart Zitzler

Best-Paper Awards

As part of the double-blind peer review, the 32 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 the voting, you should have received one ballot to elect the best papers with your registration package.

Papers compete in different categories according to the track to which they were submitted (e.g., GA papers compete only against other GA papers). Please **vote** *for at most one paper in each category* and place your ballot in the box at the registration desk **by 6pm on Tuesday June 29**.

Selected best paper award winners will be invited to submit an expanded version of their paper to the MIT Press journal *Evolutionary Computation.* In this schedule, nominated papers are highlighted with a star (★) to make them easier to find.

A-Life, Adaptive Behavior, Agents, and Ant Colony Optimization
Adaptive and Evolvable Network Services: Tadashi Nakano, Tatsuya Suda

Using Clustering Techniques to Improve the Performance of a Multi-Objective Particle Swarm: Gregorio Toscan

An Interactive Artificial Ant Approach to Non-Photorealistic Rendering: Yann Semet, Una-May O'Reilly, Fredo Durand

Artificial Immune Systems
Vulnerability Analysis of Immunity-Based Intrusion Detection Systems Using Evolutionary Hackers: Gerry Dozier, Douglas Brown, Krystal Cain, John Hurley

Biological Applications
Genetic Programming Neural Networks as a Bioinformatics Tool for Human Genetics: Marylyn Ritchie, Christopher Coffe

Fuzzy Dominance Based Multi-objective GA-Simplex Hybrid Algorithms Applied to Gene Net: Praveen Koduru, Sanjoy Das, Stephen Welch, Judith L. Roe

Coevolution
Automated Extraction of Problem Structure: Anthony Bucci, Jordan Pollack, Edwin de Jong

Similarities between Co-Evolution and Learning Classifier Systems and their Applications: Ramon Palacios

Evolutionary Robotics
Robot Trajectory Planner using Multi-Objective Genetic Algorithms: Eduardo Pires, Jose Machado, Paulo Oliveira

Evolved Motor Primitives and Sequences in a Hierarchical Recurrent Neural Network: Rainer Paine, Jun Tani

Evolutionary Strategies, Evolutionary Programming
Actuator Noise in Recombinant Evolution Strategies on General Quadratic Fitness Models: Hans-Georg Beyer

An Analysis of the (μ+1) EA on Simple Pseudo-Boolean Functions: Carsten Witt

On the Choice of the Population Size: Tobias Storch

Genetic Algorithms
Feature Subset Selection Class Separability and Genetic Algorithms: Erick Cantu-Paz

What Basis for Genetic Dynamics? C. Stephens, C. Chryssomalakos

Dependency Structure Matrix Analysis: Tian-Li Yu, David Goldberg

Distributed Constraint Satisfaction Restricted Recombination and Hybrid Genetic Search: Gerry Dozier, Hurley Cunningh

Mating Scheme for Controlling the Diversity-Convergence Balance for Multiobjective Optimization: Hisao Ishibuchi, Yohei Shibata

Genetic Programming
pi Grammatical Evolution: Michael O'Neill, Anthony Brabaz

Evolving Caching Strategies for the Internet: Juergen Branke, Pablo Funes, Frederik Thiele

A Descriptive Encoding Language for Evolving Modular Neural Networks: Jae-Yoon Jung, James A. Reggia

Shortcomings with Tree-structured Edge Encodings for Neural Networks: Gregory Hornby

Evolving Quantum Circuits and Programs through Genetic Programming: Paul Massey, John Clark, Susan Stepney

Learning Classifier Systems
Gradient-based Learning Updates Improve XCS Performance in Multistep Problems: Martin Butz, David Goldberg, Pier Luca Lanzi

High Classification Accuracy Does Not Imply Effective Genetic Search: Tim Kovacs, Manfred Kerber

Mixed Decision Trees: Minimizing Knowledge Representation Bias in LCS: Xavier Llora, Stewart Wilson

Real World Applications
A Broad and Narrow Approach to Interactive Evolutionary Design - An Aircraft Design Example: Oliver Bandte, Sergey Malinchik

Evolutionary Drug Scheduling Model for Cancer Chemotherapy: Liang Yong, Leung Kwong-Sak, Mok Shu Kam Tony

An Enhanced Genetic Algorithm for DNA Sequencing with Positive and Negative Errors: Thang Bui, Waleed Youssef,

Efficient Clustering-Based Genetic Algorithms in Chemical Kinetic Modelling: L. Elliott, D. Ingham, A. Kyne, N. Mera, M. Pourk, S. Whittaker

Search Based Software Engineering
Evaluating Evolutionary Testability with Software-Measurements: Frank Lammerm

*Hybridizing Evolutionary Testing with the Chaining Approach:* Phil McMinn, Mike Holcombe

About the Evolutionary Computation in Industry Track

This year's GECCO includes, for the third year, a track on Evolutionary Computation in Industry (ECI). 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 goals of the presenters in this track are to tell you about the realities and possibilities of evolutionary computation applications and to describe successful industrial applications, rather than to focus on technical details of the particular approaches taken.

The six sessions in the Evolutionary Computation in Industry track will take place in Whidbey:

Session	Track	Time
ECI1	Applications in the aerospace industry	Monday 10:30-12:35
ECI2	Scheduling	Monday 13:50-15:30
ECI3	Applications in the automotive and military industry	Tuesday 10:30-12:35
ECI4	Antennae and evolutionary hardware	Tuesday 13:50-15:30
ECI5	Design issues	Wednesday 10:30-12:35
ECI6	Panel	Wednesday 13:50-15:30

Hotel Floor Plan
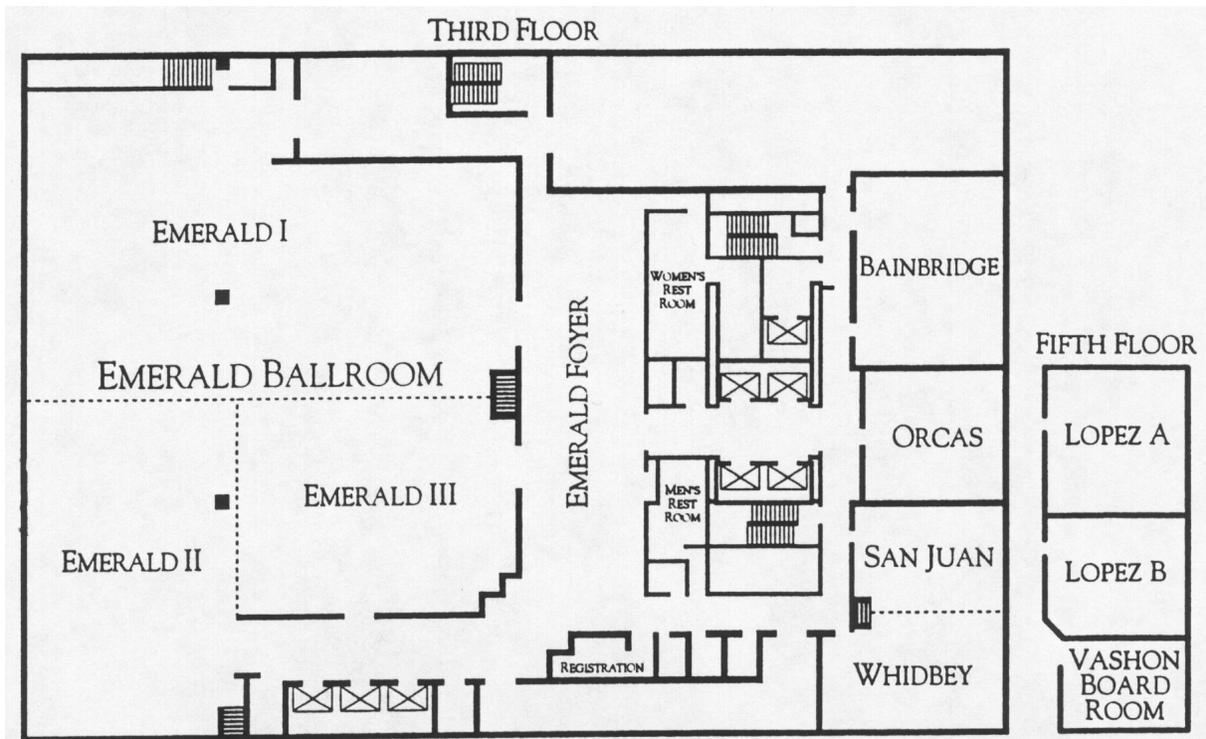
Schedule at a Glance
Saturday, June 26
Workshops and Tutorials

Workshops	8:30-10:20	10:40-12:30	14:00-15:50	16:10-18:00
Application of Hybrid Evolutionary Algorithms to Complex Optimization Problems	**Whidbey**			
Military and Security Applications of Evolutionary Computation	**Emerald II**			
Evolutionary Computation Theory	**Emerald I**			
International Workshop on Learning Classifier Systems (IWLCS)	**Orcas**			
Grammatical Evolution (GEWS 2004)			**Whidbey**	
Undergraduate Student Workshop			**San Juan**	
Modularity, Regularity and Hierarchy in Open-Ended Evolutionary Computation			**Bainbridge**	

Tutorials				
Particle Swarm Optimization	**Bainbridge**			
Evolutionary Algorithms for Combinatorial Optimization	**Lopez A**			
Representations	**Lopez B**			
Evolvable Physical Media	**San Juan**			
Introductory Statistics for Evolutionary Computation		**Bainbridge**		
Evolutionary Algorithms for Design		**Lopez A**		
Evolvable Hardware Applications		**San Juan**		
Grammatical Evolution		**Lopez B**		
Biological Applications			**Emerald I**	
A Unified Approach to Evolutionary Computation			**Lopez A**	
Interactive Evolutionary Computation			**Emerald II**	
Theoretical Population Genetics			**Lopez B**	
Probabilistic Model-building Genetic Algorithms				**Emerald II**
Optimization in Dynamic Environments				**Emerald I**
Genetic Programming for Symbolic Regression				**Lopez A**
Taxonomy and Coarse Graining in Evolutionary Computation				**Lopez B**

REGISTRATION: 7:00 - 17:00 on the 3rd floor in the Emerald Foyer
COFFEE BREAKS: 10:20 – 10:40 and 15:50 – 16:10
There will be coffee stations on the 3rd floor in the Emerald Foyer and in Emerald III, and in the corridor on the 5th floor.
LUNCH: 12:30 – 14:00 on your own.

Workshops and Tutorial Schedule
Saturday June 26

Full Day Workshops (8:30 – 18:00)

International Workshop on Learning Classifier Systems　　　　　　　　**Orcas**
Wolfgang Stolzmann, Pier-Luca Lanzi, Stewart Wilson

Morning Workshops (8:30 – 12:30)

**Application of Hybrid Evolutionary Algorithms
to Complex Optimization Problems**　　　　　　　　**Whidbey**
Ernesto Costa, Francisco Baptista Pereira, Günther Raidl

Military and Security Applications of Evolutionary Computation　　　**Emerald II**
Stephen C. Upton, David Goldberg

Evolutionary Computation Theory　　　　　　　　**Emerald I**
Alden Wright, Jon Rowe, Chris Stephens, Neal Richter

Afternoon Workshops (14:00 – 18:00)

Grammatical Evolution (GEWS 2004)　　　　　　　**Whidbey**
Michael O'Neill, Conor Ryan

Undergraduate Student Workshop　　　　　　　　**San Juan**
Mark M. Meysenburg

**Modularity, Regularity and Hierarchy in
Open-ended Evolutionary Computation**　　　　　　**Bainbridge**
Hod Lipson, Edwin De Jong, John Koza

Early Morning Tutorials (8:30 – 10:20)

Particle Swarm Optimization　　　　　　　　　**Bainbridge**
Russ Eberhart

EAs for Combinatorial Optimization　　　　　　**Lopez A**
Peter Ross

Representations　　　　　　　　　　　　**Lopez B**
Franz Rothlauf

Evolvable Physical Media　　　　　　　　　**San Juan**
Julian Miller

Late Morning Tutorials (10:40 – 12:30)

Introductory Statistics for Evolutionary Computation   **Bainbridge**
    Steffen Christensen and Mark Wineberg

Evolutionary Algorithms for Design   **Lopez A**
    Ian Parmee

Evolvable Hardware Applications   **San Juan**
    Tetsuya Higuchi

Grammatical Evolution   **Lopez B**
    Conor Ryan

Early Afternoon Tutorials (14:00 – 15:50)

Biological Applications   **Emerald I**
    James A. Foster, Wolfgang Banzhaf

A Unified Approach to EC   **Lopez A**
    Ken De Jong

Interactive Evolutionary Computation   **Emerald II**
    Hideyuki Takagi

Theoretical Population Genetics   **Lopez B**
    Joseph Felsenstein

Late Afternoon Tutorials (16:10 – 18:00)

Probabilistic Model-building GAs   **Emerald II**
    Martin Pelikan

Optimization in Dynamic Environments   **Emerald I**
    Jürgen Branke

GP for Symbolic Regression   **Lopez A**
    Maarten Keijzer

Taxonomy and Coarse Graining in EC   **Lopez B**
    Chris Stephens

Schedule at a Glance
Sunday, June 27
Workshops, Tutorials and
Human-Competitive Results

Workshops

Workshops	8:30-10:20	10:40-12:30	14:00-15:50	16:10-18:00
Interactive Evolutionary Computing	Orcas	Orcas		
Neutral Evolution in Evolutionary Computation	San Juan	San Juan		
Graduate Student Workshop	Whidbey	Whidbey		
Evolvability in Evolutionary Computation (EEC)	Bainbridge			
Self-Organization on Representations for Genetic and Evolutionary Algorithms		Emerald I		
Regeneration and Learning in Developmental Systems (WORLDS)			San Juan	San Juan
Optimization by Building and Using Probabilistic Models (OBUPM 2004)			Orcas	Orcas
Biological Applications of Genetic and Evolutionary Computation (BioGEC)				Emerald I
Learning, Adaptation, and Approximation in EC	CANCELLED			

Tutorials

Tutorials	8:30-10:20	10:40-12:30	14:00-15:50	16:10-18:00
Genetic Algorithms	Lopez A			
Evolutionary Robotics	Emerald II			
Evolutionary Fault Tolerant Systems	Lopez B			
Computational Complexity and Evolutionary Computation	Emerald I			
Genetic Programming		Lopez A		
Evolutionary Music		Emerald II		
Genetic Algorithm Theory		Lopez B		
Bionik: Building on Biological Evolution		Bainbridge		
Evolution Strategies			EmeradI II	
Industrial Evolutionary Computing			Lopez A	
Genetic Programming Theory			Lopez B	
Multiobjective Optimization with Evolutionary Computation			Emerald I	
Learning Classifier Systems				Lopez A
Evolving Neural Networks				Emerald II
Spatially Structured Evolutionary Algorithms				Bainbridge
No Free Lunch				Lopez B

Human-competitive results

Human-competitive results	8:30-10:20	10:40-12:30	14:00-15:50	16:10-18:00
Presentations of entries of $5000 human-competitive result prize competition			Bainbridge	

RECEPTION: 18:30 – 19:30 in Emerald Ballroom.

Vegetable crudités, fresh baled quiche, fruit & cheese, chicken & beef skewers, wine and soft drinks will be served.

LUNCH: 12:30 – 14:00 on your own.
REGISTRATION: 7:30 - 17:00 on the 3rd floor in the Emerald Foyer
COFFEE BREAKS: 10:20 – 10:40 and 15:50 – 16:10
There will be coffee stations on the 3rd floor in the Emerald Foyer and in Emerald III, and in the corridor on the 5th floor.

Full Day Workshops (8:30 – 18:00)

Graduate Student Workshop **Whidbey**
Terry Riopka

Morning Workshops (8:30 – 12:30)

Interactive Evolutionary Computing **Orcas**
Ian Parmee

Neutral Evolution in Evolutionary Computation **San Juan**
Tina Yu

Early Morning Workshops (8:30 – 10:20)

Evolvability in Evolutionary Computation (EEC) **Bainbridge**
Hideaki Suzuki, Hidefumi Sawai

Late Morning Workshops (10:40 – 12:30)

**Self-Organization on Representations for
Genetic and Evolutionary Algorithms** **Emerald I**
Ivan Garibay, Greg Holifield, Annie Wu

Afternoon Workshops (14:00 – 18:00)

Regeneration and Learning in Developmental Systems (WORLDS) **San Juan**
Julian Miller

Optimization by Building and Using Probabilistic Models (OBUPM 2004) **Orcas**
Martin Pelikan, Kumara Sastry, and Dirk Thierens

Late Afternoon Workshops (16:10 – 18:00)

**Biological Applications of Genetic and
Evolutionary Computation (BioGEC)** **Emerald I**
Jason H. Moore, Marylyn D. Ritchie

Early Morning Tutorials (8:30 – 10:20)

Genetic Algorithms **Lopez A**
Erik Goodman

Evolutionary Robotics **Emerald II**
Dario Floreano

Evolutionary Fault Tolerant Systems **Lopez B**
Garry Greenwood

Computational Complexity and EC **Emerald I**
Ingo Wegener

Late Morning Tutorials (10:40 – 12:30)

Genetic Programming   **Lopez A**
  John Koza

Evolutionary Music   **Emerald II**
  Al Biles

Genetic Algorithm Theory   **Lopez B**
  Jonathan Rowe

Bionik: Building on Biological Evolution   **Bainbridge**
  Ingo Rechenberg

Early Afternoon Tutorials (14:00 – 15:50)

Evolution Strategies   **Emerald II**
  Thomas Bäck

Industrial Evolutionary Computing   **Lopez A**
  Arthur Kordon, Guido Smits and Mark Kotanchek

Genetic Programming Theory   **Lopez B**
  William B. Langdon

Multiobjective Optimization with EC   **Emerald I**
  Kalyanmoy Deb

Late Afternoon Tutorials (16:10 – 18:00)

Learning Classifier Systems   **Lopez A**
  Tim Kovacs

Evolving Neural Networks   **Emerald II**
  Xin Yao

Spatially Structured EAs   **Bainbridge**
  Marco Tomassini

No Free Lunch   **Lopez B**
  Darrell Whitley

Human-competitive results (14:00 – 15:50)

**Presentations of Entries of $5000 Human-competitive
Result Prize Competition**   **Bainbridge**
Committee: David Goldberg, Erik Goodman, Wolfgang Banzhaf, John Koza (Secretary)

Evening (18:30 – 19:30)

OPENING RECEPTION   **EMERALD BALLROOM 3RD FLOOR**
Greet old friends and meet new ones at the conference's opening reception! Enjoy the evolutionary music background by Al Biles! The reception is free to all registered GECCO attendees. Your badge is your admission ticket, please remember to wear it. Vegetable crudités, fresh baled quiche, fruit & cheese, chicken & beef skewers, wine and soft drinks will be served

Schedule at a Glance
Monday June 28

	Emerald I	Emerald II	Bainbridge	Lopez A	Lopez B	Whidbey	Orcas	San Juan
08:30-10:00	Plenary session in **Emerald I:** Leroy Hood							
10:00-10:30	Coffee break							
10:30-12:35	GA1: The best of GA★	RWA1: Prediction and analysis	AAAA1: Ants	GP1: Representations	BioApp1: The best of BioApp★	ECI1: Applications in the aerospace industry	GA2: Algorithms	LBP1
12:35-13:50	Lunch break							
13:50-15:30	RWA2: The best of RWA★	GA3: Algorithms	AAAA2: New ideas	GP2: Techniques	SBSE1: The best of SBSE★	ECI2: Scheduling	GA4: Multi-objective optimization	LBP2
15:30-15:50	Coffee break							
15:50-17:30	GA5: Applications	RWA3: Circuits and controllers	AAAA3: Teams and culture	Coev1: The best of Coev★	ES1: Representations and algorithms	EvRob: Evolutionary robotics★	GA6: Analysis and theory	LBP3
17:30-17:50								

LUNCH: 12:35 – 13:50 on your own.
REGISTRATION: 8:00 - 17:00 on the 3rd floor in the Emerald Foyer
COFFEE BREAKS: 10:00 – 10:30 and 15:30 – 15:50
There will be coffee stations on the 3rd floor in the Emerald Foyer and in Emerald III, and in the corridor on the 5th floor.

★"Best of GECCO" paper nominations.

KEYNOTE TALK **Emerald I**

Systems Biology and the Networks of Life

Dr. Leroy Hood
President, Institute for Systems Biology
M.D., Johns Hopkins School of Medicine, 1964
Ph.D., Biochemistry, California Institute of Technology, 1968

Systems approaches to biology attempt to define the elements of a given biological system, measure their interactions and from this come to understand the systems behavior. This view has emerged from the human genome project in that a genetics parts list was provided (identification of all genes and proteins) enabling the analyses of many of life's elements. The systems view leads to the idea that biology is an informational science and the central importance of high throughput biological platforms for measuring biological data (DNA sequencing production lines, DNA arrays, etc.).

I will talk about these and give an example or two of biological systems that we have studied. I will then point out how systems biology inevitably leads to a revolution in medicine–from our current reactive medicine to a predictive, preventive and personalized medicine.

Dr. Hood's research has focused on the study of molecular immunology, biotechnology, and genomics. His professional career began at Caltech where he and his colleagues pioneered four instruments—the DNA gene sequencer and synthesizer, and the protein synthesizer and sequencer—which comprise the technological foundation for contemporary molecular biology. In particular, the DNA sequencer has revolutionized genomics by allowing the rapid automated sequencing of DNA, which played a crucial role in contributing to the successful mapping of the human genome during the 1990s. In 1992, Dr. Hood moved to the University of Washington as founder and Chairman of the cross-disciplinary Department of Molecular Biotechnology. In 2000, he co-founded the Institute for Systems Biology in Seattle, Washington to pioneer systems approaches to biology and medicine.

Most recently, Dr. Hood's lifelong contributions to biotechnology have earned him the prestigious 2003 Lemelson–MIT Prize for Innovation and Invention. He was also awarded the 2002 Kyoto Prize in Advanced Technology and the 1987 Lasker Prize for his studies on the mechanism of immune diversity. He has published more than 500 peer-reviewed papers, received 14 patents, and has co-authored textbooks in biochemistry, immunology, molecular biology, and genetics, and is a member of the National Academy of Sciences, the American Philosophical Society, the American Association of Arts and Sciences, and the Institute of Medicine. Dr. Hood has also played a role in founding numerous biotechnology companies, including Amgen, Applied Biosystems, Systemix, Darwin and Rosetta.

Monday June 28, 10:30 – 12:35

GA1: The best of GA★   **EMERALD I**   Chair: *David Goldberg*

★What Basis for Genetic Dynamics?
Christopher Stephens, Chryssomalis Chryssomalakos

★Dependency Structure Matrix Analysis
Tian-Li Yu, David Goldberg

★Mating Scheme for Controlling the Diversity-Convergence Balance for Multiobjective Optimization
Hisao Ishibuchi, Yohei Shibata

★Distributed Constraint Satisfaction Restricted Recombination and Hybrid Genetic Search
Gerry Dozier, Hurley Cunningham, Winard Britt, Funing Zhang, Winard Britt, Funing Zhang

★Feature Subset Selection Class Separability and Genetic Algorithms
Erick Cantu-Paz

RWA1: Prediction and analysis   **EMERALD II**   Chair: *Stefano Cagnoni*

Evolutionary Ensemble for Stock Prediction
Yung-Keun Kwon, Byung-Ro Moon

Self Learning Environment for Life Time Value Calculation of Customers in Insurance Domain
Mikhail Simonov, Luca Sammartino, Massimo Soroldoni, Andrea Tettamanzi, Mauro Beretta

Comparing Discrete and Continuous Genotypes on the Constrained Portfolio Selection Problem
Felix Streichert, Holger Ulmer, Andreas Zell

Exploratory data analysis with interactive evolution
Sergey Malinchik, Eric Bonabeau

Generating Multiaxis Tool Paths for Die and Mold Making with Evolutionary Algorithms
Klaus Weinert, Marc Stautner

AAAA1: Ants   **BAINDRIDGE**   Chair: *James Overholt*

Cooperative Problem Solving using an Agent Based Model
Michael Kirley, David Cornforth

A Hybrid Ant Colony Optimisation Technique for Dynamic Vehicle Routing
Darren Chitty, Marcel Hernandez

Finding Maximum Cliques with Distributed Ants
Thang Bui, Joseph Rizzo Jr

Ant System for the *k*-Cardinality Tree Problem
Thang Bui, Gnanasekaran Sundarraj

GP1: Representations   **LOPEZ A**   Chair: *Lee Spector*

Virtual Ramping of Genetic Programming Populations
Thomas Fernandez

On Multi-Class Classification by Way of Niching
Andrew McIntyre, Malcolm Heywood

Alternative Bloat Control Methods
Liviu Panait, Sean Luke

Dynamic Limits for Bloat Control
Sara Silva, Ernesto Costa

Adapting Representation in Genetic Programming
Cezary Janikow

BioApp1: The best of BioApp★   LOPEZ B   Chair: *James A. Foster*

Evolutionary Computation Techniques for Optimizing Fuzzy Cognitive Maps in Radiation Therapy Systems
Konstantinos Parsopoulos, Elpiniki Papageorgiou, Petros Groumpos, Michael Vrahatis

★Genetic Programming Neural Networks as a Bioinformatics Tool for Human Genetics
Marylyn Ritchie, Christopher Coffey, Jason Moore

★Fuzzy Dominance Based Multi-objective GA-Simplex Hybrid Algorithms Applied to Gene Network Models
Praveen Koduru, Sanjoy Das, Stephen Welch, Judith L. Roe

GA-facilitated Knowledge Discovery and Pattern Recognition Optimization
Michael Peterson, Travis Doom, Michael Raymer

Selection-Insertion Schemes in Genetic Algorithms for the Flexible Ligand Docking Problem
Helio Barbosa, Camila Magalhaes, Laurent Dardenne

ECI1: Applications in the aerospace industry   WHIDBEY   Chair: *Mark Jakiela*

Aerodynamic Design Optimization Using Evolutionary Algorithms
Yaochu Jin

How Boeing Commercial Is Leveraging Evolutionary Computation In Design
Thomas Dickens

Production Applications of Genetic Algorithm in Multi-disciplinary Aircraft Engine Designs
Brent Staubach, Siu Tong

GA2: Algorithms   ORCAS   Chair: *Dirk Thierens*

Winnowing Wheat from Chaff: The Chunking GA
Hal Stringer, Annie Wu

The Shifting Balance Genetic Algorithm as more than just another Island Model GA
Mark Wineberg, Jun Chen

Improving the Perfomance of a Genetic Algorithm by the Use of a Variable-Reordering Algorithm
Eduardo Rodriguez-Tello, Jose Torres-Jimenez

Subthreshold Seeking Behavior and Robust Local Search
Darrell Whitley, Jonathan Rowe, Keith Bush

Population-based Iterated Local Search: Guiding Neighbourhood Search by Crossover
Dirk Thierens

LBP1   SAN JUAN   Chair: *Bart Rylander*

Parametric Regression Through Genetic Programming
Edwin Roger Banks, James Hayes, Edwin Nunez

The Harmonic Decision Matrix: a Group Of Operators For The Fuzzy-Logic, Multi-Objective Decisions and Optimizations
Benoit Bagot

 Search Operator Bias in Linearly Structured Genetic Programming
Garnet C. Wilson, Malcolm I. Heywood

Towards a Generally Applicable Self-adapting Hybridization of Evolutionary Algorithms
Wilfried Jakob, Christian Blume, Georg Bretthauer

An Adaptive Diploid Evolutionary Algorithm for Floating-Point Representations in Dynamic Environments
A. Sima Uyar

Optimising the Performance of a Formula One Car using a Genetic Algorithm
Krzysztof Wloch , Peter J. Bentley

Double Orthogonal Arrays Based Genetic Algorithm for Primer Design
Chungnan Lee, Yi-Te Li , Jain-Shing Wu, Ta-Yuan Chou

Development Of The Parallel Optimization Method Based On Genetic Simulated Annealing
Z.G Wang, Y.S. Wong , M. Rahman

Monday June 28, 13:50 – 15:30

RWA2: The best of RWA★   **EMERALD I**   Chair: *Mike Cattolico*

★Efficient Clustering-Based Genetic Algorithms in Chemical Kinetic Modelling
Lionel Elliott, Derek Ingham, Adrian Kyne, Nicolae Mera, Mohamed Pourkashanian, sean whittaker

★Evolutionary Drug Scheduling Model for Cancer Chemotherapy
Liang Yong, K.S. Leung, Mok Shu Kam Tony

★A Broad and Narrow Approach to Interactive Evolutionary Design - An Aircraft Design Example
Oliver Bandte, Sergey Malinchik

★An Enhanced Genetic Algorithm for DNA Sequencing with Positive and Negative Errors
Thang Bui, Waleed Youssef

GA3: Algorithms   **EMERALD II**   Chair: *Annie Wu*

Exploiting Modularity Hierarchy and Repetition in Variable-Length Problems
Edwin de Jong, Dirk Thierens

Combining a Memetic Algorithm with Integer Programming
Ivana Ljubic, Gunnar Klau, Andreas Moser, Petra Mutzel, Philipp Neuner, Ulrich Pferschy, Günther Raidl, Rene Weiskircher

Distribution of Evolutionary Algorithms in Heterogeneous Networks
Juergen Branke, Andreas Kamper, Hartmut Schmeck

Robust and Efficient Genetic Algorithms with Hierarchical Niching and a Sustainable-
Jianjun Hu, Erik Goodman

AAAA2: New ideas   **BAINDRIDGE**   Chair: *Eric Bonabeau*

Artificial Life and Natural Intelligence
Keith Downing

Bluenome: A Novel Developmental Model of Artificial Morphogenesis
Taras Kowaliw, Peter Grogono, Nawwaf Kharma

A New Universal Cellular Automaton Discovered by Evolutionary Algorithms
Emmanuel Sapin, Olivier Bailleux, Jean-Jacques Chabrier, Pierre Collet

Implications of Epigenetic Learning via Modification of Histones on Performance of GP
Ivan Tanev, Kikuo Yuta

GP2: Techniques   **LOPEZ A**   Chair: *Una-May O'Reilly*

Evolving Local Search Heuristics for SAT Using Genetic Programming
Alex Fukunaga

Using Genetic Programming to Obtain a Closed-Form Approximation to a Recursive Function
Evan Kirshenbaum, Henri Suermondt

A Demonstration of Neural Programming Applied to Non-Markovian Problems
Gabriel Balan, Sean Luke

Robotic Control Using Hierarchical Genetic Programming
Marcin Pilat, Franz Oppacher

SBSE1: The best of SBSE★   **LOPEZ B**   Chair: *John Clark*

Search Based Automatic Test-Data Generation at an Architectural Level
Yuan Zhan, John Clark

★Evaluation of Different Fitness Functions for the Evolutionary Testing of an Autonomous Parking Syst
Joachim Wegener, Oliver Bühler

Evaluating Evolutionary Testability with Software-Measurements
Frank Lammermann, Andre Baresel, Joachim Wegener

★Hybridizing Evolutionary Testing with the Chaining Approach
Phil McMinn, Mike Holcombe

ECI2: Scheduling   **WHIDBEY**   Chair: *Peter Ross*

Scheduling with Evolutionary Algorithms: Some Thoughts and an Example
Peter Ross

Scheduling Production and Delivery of Liquid Oxygen and Nitrogen to 10,000 Sites With a Combined Genetic Algorithm and Ant System
David Davis

Scheduling Steam Injection for Oil Wells
Charles Guthrie

GA4: Multi-objective optimization   **ORCAS**   Chair: *Kalyanmoy Deb*

Dynamic Uniform Scaling for Multiobjective Genetic Algorithms
Gerulf Pedersen, David Goldberg

Optimal Operating Conditions for Overhead Crane Maneuvering Using Multi-Objective EAs
Kalyanmoy Deb, Naveen Gupta

Simple Population Replacement Strategies for a Steady-State Multi-Objective Evolutionary Algorithm
Christine Mumford

Some Issues on the Implementation of Local Search in Evolutionary Multiobjective Optimization
Hisao Ishibuchi, Kaname Narukawa

LBP2   **SAN JUAN**   Chair: *Chris Monson*

Periodicity Emerges from Evolved Energy-Efficient and Long-Range Brachiation
Richard W. Timm, Hod Lipson

Empirical Comparison of Incremental Reuse Strategies in Genetic Programming for Keep-Away Soccer
William H. Hsu, Scott J. Harmon, Edwin Rodriguez, Christopher Zhong

Incremental Evolution of Autonomous Controllers for Unmanned Aerial Vehicles using Multi-objective Genetic Programming
Gregory J. Barlow, Choong K. Oh, Edward Grant

KLP Not Always Efficient
Sanyou Zeng, Lixin Ding, Shuzhen Yao, Lishan Kang

Methods for Covering Missing Data in XCS
John H. Holmes, Jennifer A. Sager, Warren B . Bilker

An Architecture for Massive Parallelization of the Compact Genetic Algorithm
Fernando G. Lobo, Claudio Lima, Hugo Martires

Monday June 28, 15:50-17:30

GA5: Applications   **EMERALD I**   Chair: *Dirk Thierens*

Dynamic and Scalable Evolutionary Data Mining:
Olfa Nasraoui, Carlos Rojas, Cesar Cardona

PID Controller Tuning for Stable and Unstable Processes Applying GA
Jose Torres-Jimenez, Marco Paz, Enriqe Quintero

Applying Search Algorithms to the Temperature Inversion Problem
Monte Lunacek, Darrell Whitley, Philip Gabriel, Graeme Stephens

Using a Genetic Algorithm to Design and Improve Storage Area Network Architectures
Paul Layzell, Liz Dicke, Andrew Byde, Dave Cliff

RWA3: Circuits and controllers EMERALD II Chair: *Kevin Seppi*

Transfer of Neuroevolved Controllers in Unstable Domains
Faustino Gomez, Risto Miikkulainen

An Evolutionary Constraint Satisfaction Solution for Over the Cell Channel Routing
Adnan Acan, Ahmet Unveren

A Hybrid Genetic Approach for Circuit Bipartitioning
Jong-Pil Kim, Yong-Hyuk Kim, Byung-Ro Moon

An Island-based GA Implementation for VLSI Standard-cell Placement
Guangfa Lu, Shawki Areibi

AAAA3: Teams and culture BAINDRIDGE Chair: *Michael O'Neill*

Cultural Evolution for Sequential Decision Tasks
Dara Curran, Colm O'Riordan

Organizational Strategic Adaptation in the Presence of Inertia and Errorful Assessments of Payoffs
Anthony Brabazon, Arlindo Silva, Tiago Ferra de Sousa, Michael O'Neill, Robin Matthews, Ernesto Costa

Automatic Creation of Team-Control Plans Using an Assignment Branch in Genetic Programming
Talbott Walter

Efficient Evaluation Functions for Multi-Rover Systems
Adrian Agogino, Kagan Tumer

Coev1: The best of Coev★ LOPEZ A Chair: *Paul Wiegand*

A Cooperative Coevolutionary Multiobjective Algorithm Using Non-dominated Sorting
Antony Iorio, Xiaodong Li

★Similarities between Co-Evolution and Learning Classifier Systems and their Applications
Ramon Palacios-Durazo, Manuel Valenzuela-Rend¢n

The Incremental Pareto-Coevolution Archive
Edwin de Jong

★Automated Extraction of Problem Structure
Anthony Bucci, Jordan Pollack, Edwin de Jong

ES1: Representations and algorithms LOPEZ B Chair: *Hans-Georg Beyer*

An Evolution Strategy using a Continuous Version of the Gray-code Neighbourhood Distribution
Jonathan Rowe, Dzena Hidovic

Node-depth Encoding for Evolutionary Algorithms Applied to Network Design
Alexandre Delbem, Andre de Carvalho, Claudio Policastro, Adriano Pinto, Karen Honda, Anderson Garcia

Convergence Examples of a Filter-Based Evolutionary Algorithm
Lauren Clevenger, William Hart

Randomized Local Search Evolutionary Algorithms and the Minimum Spanning Tree Problem
Frank Neumann, Ingo Wegener

EvRob: Evolutionary robotics★ WHIDBEY Chair: *Dario Floreano*

Learning to Acquire Autonomous Behavior
Yutaka Inoue, Takahiro Tohge, Hitoshi Iba

Evolution Robustness and Adaptation of Sidewinding Locomotion of Simulated Snake-like Robot
Ivan Tanev, Thomas Ray, Andrzej Buller

★Robot Trajectory Planner using Multi-Objective Genetic Algorithm
Eduardo Pires, Jos, Machado, Paulo Oliveira

★Evolved Motor Primitives and Sequences in a Hierarchical Recurrent Neural Network
Rainer Paine, Jun Tani

GA6: Analysis and theory ORCAS Chair: *Kenneth De Jong*

Inequality's Arrow: The Role Of Greed & Order In Genetic Algorithms
Anil Menon

Bistability of the Needle Function in the Presence of Truncation Selection
Alden Wright, Greg Cripe

Growth Curves and Takeover Time in Distributed Evolutionary Algorithms
Gabriel Luque, Enrique Alba

Modelling Selection Intensity for Toroidal Cellular Evolutionary Algorithms
Mario Giacobini, Enrique Alba, Andrea Tettamanzi, Marco Tomassini

LBP3 (15:50-17:50) SAN JUAN Chair: *Erick Cantu-Paz*

Using GP to Model Contextual Human Behavior - Competitive with Human Modeling Performance
Hans Fernlund, Avelino Gonzalez

Investigating the Evolvability of Biologically Inspired CA
David Basanta, Mark Miodownik, Peter Bentley , Elizabeth Holm

Phylogenetic Inference Using Evolutionary Multi-Objective Optimisation
Leon Poladian , Lars Jermiin

A Local Search Algorithm Based on Genetic Recombination for Traveling Salesman Problem
Peng Gang , Ichiro Iimura, Hidenobu Tsurusawa, Shigeru Nakayama

A Comparative Analysis of Simplification and Complexification in the Evolution of Neural Network Topologies
Derek James, Philip Tucker

Self-Adaptation In Genetic Algorithms Using Multiple Genomic Redundant Representations
Maheswara Prasad, Kasinadhuni Michael L., Gargano Joseph, DeCicco William, Edelson

Application of a Neuroevolutionary Approach to Emergent Task Decomposition in Collective Robotics
Jekanthan Thangavelautham, Gabriele M.T., D'Eleuterio

Discrimination of Unexploded Ordnance from Clutter Using Linear Genetic Programming
Frank D. Francone, Larry Deschaine, Jeffrey J. Warren, Thomas Battenhouse, Jr.

Schedule at a Glance
Tuesday June 29

	Emerald I	Emerald II	Bainbridge	Lopez A	Lopez B	Whidbey	Orcas	San Juan
08:30-10:00	Plenary session in **Emerald I**: François Baneyx							
10:00-10:30	Coffee break							
10:30-12:35	RWA4: Pattern recognition and graphics	GP3: The best of GP★	GA7: Analysis and theory	GA8: Algorithms	AIS: Artificial immune systems★	ECI3: Applications in the automotive and military industry	BioApp2: Regulatory networks and classification	LBP4
12:35-13:50	Lunch break							
13:50-15:30	POSTER SETUP	AAAA4: The best of AAAA★	GA9: Linkage learning and model building	GA10: Rules and neurons	RWA5: Image and signal processing	ECI4: Antennae and evolutionary hardware	GP4: Analysis	SBSE2: Other SBSE
15:30-15:50	Coffee break							
15:50-17:30	POSTER SETUP	GA11: Analysis and theory	LCS1: The best of LCS★	ES2: The best of ES★	RWA6: Vehicles and traffic	GA12: Crossover	EHard: Evolvable hardware	LBP5
17:30-17:55								
17:55-19:00	Break							
19:00-22:00	Poster session in **Emerald I**							

REGISTRATION: 8:00 - 17:00 on the 3rd floor in the Emerald Foyer
COFFEE BREAKS: 10:00 – 10:30 and 15:30 – 15:50
LUNCH: 12:35 – 13:50 on your own.
POSTER SESSION: We will serve desserts with coffee, tea, wine and soft drinks
★"Best of GECCO" paper nominations. **REMEMBER TO VOTE ON THE BEST PAPERS AND SUBMIT YOUR BALLOT AT THE REGISTRATION DESK**

KEYNOTE TALK   **Emerald I**

Nanotechnology: Current Status and Forthcoming Challenges

Professor François Baneyx
Professor of Chemical Engineering and adjunct Professor of Bioengineering
Center for Nanotechnology at University of Washington

The ability to synthesize, manipulate and organize nanometer-size objects into functional structures holds enormous promise in our quest for new materials, opto-electronics devices, computational tools and for a variety of biotechnological and biomedical applications. To realize the promise of nanotechnology, significant hurdles will have to be overcome.

In this presentation, I will showcase groundbreaking research in nanoscience and nanotechnogy by members of the University of Washington Center for Nanotechnology, highlight the challenges of the discipline and discuss how convergence with computational approaches may help overcome current hurdles.

Dr. Baneyx earned his Ph.D. in Chemical Engineering from the University of Texas at Austin in 1991 and was a Visiting Scientist for one year at the Du Pont Experimental Station in Wilmington, DE.

In 1992, he joined the Department of Chemical Engineering at the University of Washington, Seattle, where he is currently Professor of Chemical Engineering and Bioengineering and co-director of the Center for Nanotechnology.

Dr. Baneyx holds three patents, has authored one textbook, edited one volume and contributed over fifty scientific papers. His research interests include molecular chaperones, protein folding, protein expression, microbial-based sensing and computation, molecular biomimetics and nanobiotechnology.

Tuesday June 29, 10:30 – 12:35

RWA4: Pattern recognition and graphics (10:30–12:10)   **EMERALD I**   Chair: *Terence Soule*

Evolving a Roving Eye for Go
Kenneth Stanley, Risto Miikkulainen

Feature Synthesis using Genetic Programming for Face Expression Recognition
Bir Bhanu, Jiangang Yu, Xuejun Tan, Yingqiang Lin

CellNet Co-Ev: Evolving Better Pattern Recognizers Using Competetive Co-Evolution
Nawwaf Kharma, Taras Kowaliw, Chris Jensen, Moghnieh Hussein, Yao Jane

Optimization of Constructive Solid Geometry via a Tree-Based Multi-Objective Genetic Algorithm
Karim Hamza, Kazuhiro Saitou

GP3: The best of GP★   **EMERALD II**   Chair: *Riccardo Poli*

★A Descriptive Encoding Language for Evolving Modular Neural Networks
Jae-Yoon Jung, James A. Reggia

★Evolving Caching Strategies for the Internet
Juergen Branke, Pablo Funes, Frederik Thiele

★Shortcomings with Tree-structured Edge Encodings for Neural Networks
Gregory Hornby

★Evolving Quantum Circuits and Programs through Genetic Programming
Paul Massey, John Clark, Susan Stepney

★pi Grammatical Evolution
Michael O'Neill, Anthony Brabazon, Miguel Nicolau, Sean Mc Garraghy, Peter Keenan

GA7: Analysis and theory   **BAINDRIDGE**   Chair: *Jonathan Rowe*

The Ising Model on the Ring: Mutation versus Recombination
Simon Fischer, Ingo Wegener

Ruffled by Ridges: How Evolutionary Algorithms Can Fail
Darrell Whitley, Monte Lunacek

Upper Bounds on the Time and Space Complexity of Optimizing Additively Separable Functions
Matthew Streeter

Analysis of the (1+1) EA for a Noisy OneMax
Stefan Droste

A Statistical Model of GA Dynamics for the OneMax Problem
Bulent Buyukbozkirli, Erik Goodman

GA8: Algorithms   **LOPEZ A**   Chair: *Kalyanmoy Deb*

Trap Avoidance in Strategic Game Playing with Case Injected Genetic Algorithms
Chris Miles, Sushil Louis, Rich Drewes

Adaptive Sampling for Noisy Problems
Erick Cantu-Paz

Parameter-less Optimization with the Extended Compact Genetic Algorithm and Iterated Local Search
Claudio Lima, Fernando G. Lobo

Introduction of a New Selection Parameter in Genetic Algorithm
Laure Rigal, Bruno Castanier, Philippe Castagliola

Simultaneity Matrix for Solving Hierarchically Decomposable Functions
Chatchawit Aporntewan, Prabhas Chongstitvatana

AIS: Artificial Immune Systems★   LOPEZ B   Chair: *Dipankar Dasgupta*

A Comment on opt-AiNET: An Immune Network Algorithm for Optimisation
Jonathan Timmis, Camilla Edmonds

Real-Valued Negative Selection using Variable-Sized Detectors
Zhou Ji, Dipankar Dasgupta

An Investigation of r-Chunk Detector Generation on Higher Alphabets
Thomas Stibor, Kpatscha M. Bayarou

Combining Computational Immunology and Coevolutionary GA for Anomaly Detection
Xiaoshu Hang, Honghua Dai

★Vulnerability Analysis of Immunity-Based Intrusion Detection Systems Using Evolutionary Hackers
Gerry Dozier, Douglas Brown, Krystal Cain, John Hurley

ECl3: Applications in the automotive and military industry   WHIDBEY   Chair: *Mark Jakiela*

Decomposition-Based Assembly Synthesis Of Automotive Body Structures
Kazuhiro Saitou

Multiobjective Optimization With GA's Is Now Considered Routine
David Powell

BioApp2: Regulatory networks and classification   ORCAS   Chair: *Wolfgang Banzhaf*

Automating Genetic Network Inference Using a Very Low Sampling Estimation-Verification EA
Josh Bongard, Hod Lipson

A GA Approach to the Definition of Regulatory Signals in Genomic Sequences
Roberto Mosca, Giulio Pavesi, Mauri Giancarlo

Optimizing Topology and Parameters of Gene Regulatory Network Models from Time-Series Experiments
Christian Spieth, Felix Streichert, Nora Speer, Andreas Zell

Identification of Informative Genes for Molecular Classification
Topon Paul, Hitoshi Iba

Comparing Genetic Programming and Evolution Strategies on Inferring Gene Regulatory Networks
Felix Streichert, Hannes Planatscher, Christian Spieth, Holger Ulmer, Andreas Zell

LBP4 (10:30–12:15)   SAN JUAN   Chair: *Robert Heckendorn*

Investigation of Constant Creation Techniques in the Context of Gene Expression Programming
Xin Li, Chi Zhou, Peter C. Nelson, Thomas M. Tirpak

An Agent Too Far: The Genetic Distance Evaluation of a Simulated World
E. J. P. Earon, G. M. T. D'Eleuterio

Improving Evolutionary Algorithms with Multi-representation Island Models
Zbigniew Skolicki, Kenneth De Jong

A-HEP: Adaptive Hybrid Evolutionary Programming for Learning Bayesian Networks
Kit-Ying Lee, Man-Leung Wong, Yong Liang, Kwong-Sak Leung, Kin-Hong Lee

Developing Automated Helicopter Models Using Simulated Annealing and Genetic Search
Namir Aldawoodi , Rafael Perez , Wendy Alvis, Kimon Valavanis

Advanced Formula Prediction using Simulated Annealing
Namir Aldawoodi , Rafael Perez

The RBF-Gene model
Virginie Lefort, Carole Knibbe, Guillaume Beslon, Joël Favrel

Tuesday June 29, 13:50 – 15:30

AAAA4: The best of AAAA★   **EMERALD II**   Chair: *Julian Miller*

★Adaptive and Evolvable Network Services
Tadashi Nakano, Tatsuya Suda

★Using Clustering Techniques to Improve the Performance of a Multi-Objective Particle Swarm Optimizer
Gregorio Toscano Pulido, Carlos Coello Coello

★An Interactive Artificial Ant Approach to Non-Photorealistic Rendering
Yann Semet, Una-May O'Reilly, Fredo Durand

Evolving a Self-Repairing Mature French Flag Organism
Julian Miller

GA9: Linkage learning and model building   **BAINDRIDGE**   Chair: *Martin Pelikan*

Real-coded Bayesian Optimization Algorithm
Chang Wook Ahn, R. S. Ramakrishna, David Goldberg

Quality and Efficiency of Model Building for Genetic Algorithms
Tian-Li Yu, David Goldberg

Introducing Subchromosome Representations to the Linkage Learning Genetic Algorithm
Ying-ping Chen, David Goldberg

Linkage Identification by Nonlinearity Check for Real-Coded Genetic Algorithms
Masaru Tezuka, masaharu munetomo, Kiyoshi Akama

GA10: Rules and neurons   **LOPEZ A**   Chair: *Tina Yu*

Experimental Evaluation of Discretization Schemes for Rule Induction
Jesus Aguilar-Ruiz, Jaume Bacardit, Federico Divina

Evolving Reusable Neural Modules
Joseph Reisinger, Kenneth Stanley, Risto Miikkulainen

Training Neural Networks with GA Hybrid Algorithms
Enrique Alba, J. Francisco Chicano

Evolution of Fuzzy Rule BAsed Classifiers
Jonatan Gomez

RWA5: Image and signal processing   **LOPEZ B**   Chair: *Stefano Cagnoni*

Designing Multiplicative General Parameter Filters Using Adaptive Genetic Algorithms
Jarno Martikainen, Seppo J. Ovaska

Discovery of Human-Competitive Image Texture Features Using Genetic Programming
Brian Lam, Vic Ciesielski

Memetic Optimization of Video Chain Designs
Walid Ali, Alexander Topchy

Reducing the Cost of the Hybrid Evolutionary Algorithm with Image Local Response in Electronic Imagi
Igor Maslov

ECI4: Antennae and evolutionary hardware   **WHIDBEY**   Chair: *Derek Linden, Mark Jakiela*

The Engineer's Role in Automated Design Of Antennas
Derek Linden

Evolved Antennas for NASA's Space Technology 5 Mission
Jason Lohn

GP4: Analysis   **ORCAS**   Chair: *Maarten Keijzer*

Softening the Structural Difficulty in Genetic Programming with TAG-Based Representation and Inserti
Hoai Nguyen, R I McKay

On the Strength of Size Limits in Linear Genetic Programming
Nic McPhee, Alex Jarvis, Ellery Crane

A Competitive Building Block Hypothesis
Conor Ryan, Hammad Majeed, R. Muhammad Atif Azad

Fitness Clouds and Problem Hardness in Genetic Programming
Leonardo Vanneschi, Manuel Clergue, Philippe Collard, Marco Tomassini, Sebastien Verel

SBSE2: Other SBSE (13:50–15:05)   **SAN JUAN**   Chair: *Joachim Wegener*

Finding Optimal Metrics To Classify Software Maintainability Using A Parallel Genetic Algorithm
Rodrigo Vivanco, Nicolino Pizzi

Mutation Testing Using Genetic Algorithms: A Co-evolution Approach
Konstantinos Adamopoulos, Mark Harman, Rob Hierons

Using Interconnection Style Rules to Infer Software Architecture Relations
Mitchell Brian, Spiros Mancoridis, Martin Traverso

Tuesday June 29, 15:50 – 17:30

GA11: Analysis and theory   **EMERALD II**   Chair: *Darrell Whitley*

Looking Under the EA Hood with Price's Equation
Jeffrey Bassett, Mitchell Potter, Kenneth De Jong

How Are We Doing? Predicting Evolutionary Algorithm Performance
Mark Renslow, Brenda Hinkemeyer, Bryant Julstrom

Computational Complexity and Simulation of Rare Events of Ising Spin Glasses
Martin Pelikan, Jiri Ocenasek, Simon Trebst, Matthias Troyer, Fabien Alet

Schema Disruption in Chromosomes that are Structured as Binary Trees
William Greene

LCS1: The best of LCS★ (15:50-17:55)   **BAINDRIDGE**   Chair: *Pier Luca Lanzi*

Bounding Learning Time in XCS
Martin Butz, David Goldberg, Pier Luca Lanzi

★High Classification Accuracy Does Not Imply Effective Genetic Search
Tim Kovacs, Manfred Kerber

★Gradient-based Learning Updates Improve XCS Performance in Multistep Problems
Martin Butz, David Goldberg, Pier Luca Lanzi

★Mixed Decision Trees: Minimizing Knowledge Representation Bias in LCS
Xavier Llora, Stewart Wilson

Parameter Adaptation Within Co-Adaptive Learning Classifier Systems
Chung-Yuan Huang, Chuen-Tsai Sun

ES2: The best of ES★   **LOPEZ A**   Chair: *Marc Schoenauer*

★Actuator Noise in Recombinant Evolution Strategies on General Quadratic Fitness Models
Hans-Georg Beyer

On the Complexity to Approach Optimum Solutions by Inhomogeneous Markov Chains
Andreas Albrecht

★An Analysis of the (μ+1) EA on Simple Pseudo-Boolean Functions
Carsten Witt

★On the Choice of the Population Size
Tobias Storch

RWA6: Vehicles and traffic (15:50–17:55)   **LOPEZ B**   Chair: *Talib Hussain*

Co-evolutionary Agents Self-organization for City Traffic Congestion Modeling
Luis Hercog

Solution to the Fixed Airbase Problem for Autonomous URAV Site Visitation Sequencing
Amit Agarwal, Meng-Hiot Lim, Chan Yee Chew, Tong Kiang Poo, Meng Joo Er, Yew Kong Leong

Inflight Rerouting for an Unmanned Aerial Vehicle
Amit Agarwal, Meng-Hiot Lim, Maung Ye Win Kyaw, Meng Joo Er

Hybrid Genetic Algorithms for Multi-Objective Optimisation of Water Distribution Networks
Ed Keedwell, Soon-Thiam Khu

Evolution-Based Deliberative Planning for Cooperating Unmanned Ground Vehicles in a Dynamic Environm
Talib Hussain, David Montana, Gordon Vidaver

GA12: Crossover (15:50-17:55)   **WHIDBEY**   Chair: *Marco Tomassini*

Solving Large-Scale Integer Linear Programs Using A Customized Genetic Algorithm
Kalyanmoy Deb, Koushik Pal

Crossover Population Dynamics and Convergence in the GAuGE System
Miguel Nicolau, Conor Ryan

Topological Interpretation of Crossover
Alberto Moraglio, Riccardo Poli

Central Point Crossover for Neuro-Genetic Hybrids
Soonchul Jung, Byung-Ro Moon

An Effective Real-Parameter Genetic Algorithm with Parent Centric Normal Crossover for Multimodal Op
Pedro Ballester, Jonathan N. Carter

EHard: Evolvable hardware   **ORCAS**   Chair: *Andy Tyrrell*

A Reconfigurable Chip for Evolvable Hardware
Yann Thoma, Eduardo Sanchez

High Temperature Experiments for Circuit Self-Recovery
Didier Keymeulen, Ricardo Zebulum, Vu Duong, Michael Ferguson, Xin Guo, Adrian Stoica

The Emergence of Ontogenic Scaffolding in a Stochastic Development Environment
John Rieffel, Jordan Pollack

On the Evolution of Analog Electronic Circuits Using Building Blocks on a CMOS FPTA
Joerg Langeheine, Martin Trefzer, Daniel Bruederle, Karlheinz Meier, Johannes Schemmel

LBP5 (15:50-17:50)   **SAN JUAN**   Chair: *Hod Lipson*

Virtual Witches and Warlocks: A Quidditch Simulator and Quidditch-Playing Teams Coevolved via Genetic Programming
Raphael Crawford-Marks, Lee Spector, Jon Klein

Crossover and Mutation in Genetic Algorithms Using Graph-Encoded Chromosomes
Sam Stone, Brian Pillmore, Walling Cyre

An Evolutionary Approach for Multiobjective Optimization using Adaptive Representation of Solutions
Crina Grosan

Convergence Control in ACO
Bernd Meyer

Genetic Network Programming with Reinforcement Learning and its Performance Evaluation
Shingo Mabu, Kotaro Hirasawa, Jinglu Hu

Improving on the Kalman Swarm: Extracting its Essential Characteristics
Christopher K., Monson Kevin, D. Seppi

Using Genetic Programming to Evolve Weighting Schemes for the Vector Space Model of Information Retrieval
Ronan Cummins, Colm O'Riordan

Determining the Best Parent Selection Method for a Genetic Algorithm through Varying Problem Sizes and Complexities
Daman Oberoi, Bart Ryler

Poster Session: Tuesday June 29, 19:00 – 22:00 Emerald I

Heuristic Methods for Solving Euclidean Non-uniform Steiner Tree Problems
Ian Frommer, Bruce Golden, Guruprasad Pundoor

Achieving shorter search times in voice conversion using interactive evolution
Yuji Sato

Adaptive Modified Probabilities of Crossover and Mutation
Zhang Jun, Henry S.H. Chung, Alan W.L. LO, Ju-Jang LEE

A Genetic Algorithm to Improve Agent-Oriented Natural Language Interpreters
Babak Hodjat, Junichi Ito, Makoto Amamiya

Promoting Diversity in the Population by Means of Selection Operator
Federico Divina

Optimization of Gaussian Mixture Model Parameters for Speaker Identification
Q.Y. Hong, Sam Kwong

A Multiobjective Evolutionary Technique Based on Endocrine Paradigm
Rotar Corina

HyGLEAM - Towards a Generally Applicable Self-adapting Hybridization of Evolutionary Algorithms
Wilfried Jakob, Christian Blume, Georg Bretthauer

A Parameter-free Meta-Evolution Algorithm
Joanne Walker, Simon Garrett

Evolutionary Art Revisited: Making the Process Fully Automated
AndrÈs GÛmez de Silva Garza, Ar·m Zamora Lores

Including Infeasible Solutions In the Superiority of Feasible Points Method
Kevin Alam, Musa Kamal

Controlled Content Crossover: A New Crossover Scheme and its Application
Mohammad Amin Dallaali, Malin Premaratne

Automatic Feature Selection in Neuroevolution
Shimon Whiteson, Kenneth Stanley, Risto Miikkulainen

Empirical Study of Population Diversity in Permutation-Based Genetic Algorithm
Kenny Zhu, Ziwei Liu

Elevator Car Routing by Optimizing Passenger Service Level and Energy Consumption
Tapio Tyni, Jari Ylinen

Improvement of Category based Collaborative Filtering in Fashion Design Recommender Agent System
Jung Kyung-Yong, Lee Jung-Hyun

Challenging a shipboard firemainís valve and pump control logic with evolutionary testing
carl anderson, Eric Bonabeau, John Scott

Efficient and Reliable Evolutionary Multiobjective Optimization using ?-Dominance Archiving and Ada
Venkat Devireddy, Patrick Reed

Predicting Healthcare Costs using a Classifier System
Chris Stephens, Henri Waelbroeck, Susan Talley, Rosario Cruz

Inverse Modeling Of Financial Markets With Interactive Evolution
Eric Bonabeau, Trent Ashburn

Distance Measures in Genetic Algorithms
Byung-Ro Moon, Yong-Hyuk Kim

A Bio-Inspired Genetic Algorithm With A Self-Organizing Genome: The RBF-Gene Model
Virginie Lefort, Carole Knibbe, Guillaume Beslon, JoÎl Favrel

Using GP to Model Contextual Human Behavior ñ Competitive with Human Modeling Performance
Hans Fernlund, Avelino Gonzalez

Humanoid Robot Programming based on CBR Augmented GP
Liu Hongwei, Hitoshi Iba

Development of a Genetic Algorithm for Optimization of Nanoalloys
Lesley Lloyd, Roy Johnston, Said Salhi

Search-Based Techniques For Optimizing Software Project Resource Allocation
Massimiliano Di Penta, Giuliano Antoniol, Mark Harman

Solving the Active Interval Scheduling Problem for Static Sensor Networks
Yu-Cheng Huang, Ming-Hui Jin, Cheng-Yan Kao, Chih-Kung Lee

On Parameterizing Models of Antigen-Antibody Binding Dynamics on Surfaces
Daniel Burns, Ann Rundell, Yanan Zheng, Adam North

Systematic Integration of Parameterized Local Search Techniques in Evolutionary Algorithms
Neal Bambha, Shuvra Bhattacharyya, Juergen Teich, Eckart Zitzler

Genetic approach to generating good linear block error-correcting codes
Stefano Cagnoni, Alan Barbieri, Giulio Colavolpe

Multibranches Genetic Programming as a Tool for Function Approximations
Katya Rodriguez-Vazquez, Carlos Oliver-Morales

On the Hypermutation Operators of Clonal Selection Algorithms for the 2D HP Protein Structure Predic
Giuseppe Nicosia, Vincenzo Cutello, Mario Pavone

Keeping the Diversity with Small Populations Using Logic-Based Genetic Program
Takao Terano, Ken Taniguchi

A Step Size Preserving Directed Mutation Operator
Stefan Berlik

Equilibrium and Extinction In a Trisexual Diploid Mating System
Erik Buehler, Sanjoy Das, Jack Cully

Population Size Estimation Using Local Fitness Distance Correlation
jian Zhang, Xiaohui Yuan, Bill P. Buckles

Neural Network Normalization For Genetic Search
Byung-Ro Moon, Jung-Hwan Kim, Sung-Soon Choi

Reasons of ACOs Success in TSP
Osvaldo Gómez, Benjamín Barán

Genetic Fuzzy Discretization for Classification Problems
Byung-Ro Moon, Yoon-Seok Choi

A Preliminary Application of Evolutionary Computing to Mobile Robot Localization
Ngai Kwok

Tackling an Inverse Problem from the Petroleum Industry with a Genetic Algorithm for Sampling
Pedro Ballester, Jonathan N. Carter

A Comparison Of Several Algorithms And Representations For Single Objective Optimization
Crina Grosan, Mihai Oltean

Golomb Rulers - The Influence of Representation
Francisco Pereira, Jorge Tavares, Ernesto Costa

Statistical Test-based Evolutionary Segmentation of Yeast Genome
Jesus Aguilar-Ruiz, Daniel Mateos, Raul Giraldez, Jose Riquelme Santos

A Population-Differential Method of Monitoring Success and Failure in Coevolution
Ari Bader-Natal, Jordan Pollack

A Female-Male Co-evolutionary Algorithm for Solving Constrained Optimization Problems
P. A. Simionescu, G. Dozier, D. Beale

Input sequence generation for testing of communicating finite state machines (CFSMs)
Karnig Derderian, Rob Hierons, Mark Harman

A Simple Genetic Algorithm for Scheduling Jobs with Time Windows on Multiple Machines Minimizing the
Olivera Alfredo, Nesmachnow Sergio

A Caching Genetic Algorithm for Spectral Breakpoint Matching
Jonathan Mohr, Xiaobo Li

Multi-Agent Cooperation Using Genetic Network Programming with Automatically Defined Groups
Tadahiko Murata, Takashi Nakamura

Hierarchical Breeding Control for Efficient Topology/Parameter Evolution Using Modular Primitives in
Kisung Seo, Jianjun Hu, Fan Zhun, Erik Goodman

Two methods for Size Control with Maximum Homologous Crossover
Michael Defoin Platel, Manuel Clergue, Philippe Collard

Is the Predicted ESS in the Sequential Assessment Game Evolvable?
Winfried Just, Xiaolu Sun

Multi-agent Utilities for Efficient Allele Evaluation
Adrian Agogino, Risto Miikkulainen

Cooperative Coevolution for Multisensor Fusion
Sohail Nadimi, Bir Bhanu

Confidence and Support Classification Using Genetically Programmed Neural Logic Networks
Henry Chia, Chew Lim Tan

Convergence Control in ACO
Meyer Bernd

Competing Sample Sizes for the Co-Evolution of Heterogeneous Agents
Gary Parker, Joseph Blumenthal

Populating Genomes in a Dynamic Grid
Han Yu, Ning Jiang, Annie Wu

Enhanced Innovation: A Fusion of Chance Discovery and Evolutionary Computation
Xavier Llora, Ohnishi Kei, David E. Goldberg, Ying-ping Chen

Analysis of a Parallel MOEA solving the Multiobjective Quadratic Assignment Problem
Mark Kleeman, Richard Day, Gary Lamont

A Genetic Algorithm for the Shortest Common Superstring Problem
Luis Gonzalez, Carlos Alberto Brizuela

Anomaly Detection Based on Unsupervised Niche Clustering with application to Network Intrusion Detec
Elizabeth Leon, Olfa Nasraoui, Jonatan Gomez

A Study of the Role of Single Node Mutation in Genetic Programming
Terry Soule, Wei Quan

An Evolutionary Autonomous Agent with Visual Cortex and Recurrent Spiking Columnar Neural Network
Rich Drewes, James Maciokas, Sushil Louis, Philip Goodman

Multi-agent Simulation of Airline Travel Market
Rashad Moore, Ashley Williams, John Sheppard

Comparative Molecular Binding Energy Analysis of HIV-1 Protease Inhibitors Using GA-PLS method
Yen Chih Chen, Jinn-Moon Yang, Chi Hung Tsai, Cheng-Yan Kao

On Fitness, Niching Strategies, and Hybrid Niche Size Estimation
Olfa Nasraoui, Elizabeth Leon

Sexual and Asexual Paradigms in Evolution: The Implications for Genetic Algorithms
Mark Andrews, Chris Salzberg

Multi-agent Foreign Exchange Market Modelling via GP
Riccardo Poli, Stephen Dignum

An Evolutionary Meta Hierarchical Scheduler for the Linux Operating System
Horst Wedde, Muddassar Farooq, Mario Lischka

Parsing Probabilistic Context Free Languages with Multi-Objective Genetic Algorithms (LBP)
Ramon Lefuel, Brian J. Ross

Repeated Sequences in Linear GP Genomes (LBP)
W. B. Langdon, W. Banzhaf

Schedule at a Glance
Wednesday June 30

Time	Emerald I	Emerald II	Bainbridge	Lopez A	Lopez B	Whidbey	Orcas	San Juan
08:30-10:00	ISGEC Business Meeting in **Emerald I**							
10:00-10:30	Coffee break							
10:30-12:35	GA13: Representations	RWA7: Applications	GP5: Operators	GA15: Operators	GA14: Applications	ECI5: Design issues	BioApp3: Modelling, alignment, and more	LBP6
12:35-13:50	Lunch break							
13:50-15:30	GA16: Techniques	RWA8: Applications	Comp: Competitions	AAAA5: Swarms	GA17: EDA and BOA	ECI6: Panel	Coev2: Analysis, theory and MOO	LCS2: Analysis and improvements
15:30-15:50	Coffee break							
15:50-17:30	GA18: Analysis and theory	RWA9: Real world applications	ES3: Techniques	LBP7	GA19: Techniques	LBP8	LBP9	LBP10
17:30-17:50								

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Wednesday June 30, 8:30 – 10:00

ISGEC Business Meeting   **Plenary session**   **Emerald I**

Chair: Erik Goodman

The meeting is open to all GECCO attendees. Agenda items include reports on ISGEC, GECCO 2004, and GECCO 2005.

Wednesday June 30, 10:30 – 12:35

GA13: Representations   **EMERALD I**   Chair: *Franz Rothlauf*

The Edge-Set Encoding Revisited
Carsten Tzoppe, Franz Rothlauf, Hans Josef Pesch

Improving the Locality Properties of Binary Representations
Adrian Grajdeanu, Kenneth De Jong

An Effective Chromosome Representation for Evolving Flexible Job Shop Schedules
Joc Cing Tay, Djoko Wibowo Wibowo

Effects Of Module Encapsulation In Repetitively Modular Genotypes On The Search Space
Ivan Garibay, Ozlem Garibay, Annie Wu

Evolving Genotype to Phenotype Mappings with a Multiple-Chromosome Genetic Algorithm
Chow Rick

RWA7: Applications (10:30–12:10)   **EMERALD II**   Chair: *Tim Kovacs*

Unveiling Optimal Operating Conditions for an Epoxy Polymerization Process Using Multi-Objective EA
Kalyanmoy Deb, Kishalay Mitra, Rinku Dewri, Saptarshi Majumdar

The Lens Design using the CMA-ES Algorithms
Yuichi Nagata

Validating A Model Of Colon Colouration Using An Evolution Strategy With Adaptive Approximations
Dzena Hidovic, Jonathan Rowe

Optimized Design of MEMS
Raffi Kamalian, Hideyuki Takagi, Alice Agogino

GP5: Operators   **BAINDRIDGE**   Chair: *W. B. Langdon*

Run Transferable Libraries – Learning Functional Bias in Problem Domains
Maarten Keijzer, Mike Cattolico, Conor Ryan

Comparison of Selection Strategies for Evolutionary Quantum Circuit Design
Andr, Leier, Wolfgang Banzhaf

On Naive Crossover Biases with Reproduction for Simple Solutions to Classification Problems
David Terrio, Malcolm Heywood

Grammatical Constant Creation
Ian Dempsey, Michael O'Neill, Anthony Brabazon

Memetic Crossover for Genetic Programming
Brent Eskridge, Dean Hougen

GA15: Operators **LOPEZ A** Chair: *Erick Cantu-Paz*

Designing Competent Mutation Operators via Probabilistic Model Building of Neighborhoods
Kumara Sastry, David Goldberg

A Gene Based Adaptive Mutation Strategy for Genetic Algorithms
Sima Uyar, Sanem Sariel, Gulsen Eryigit

Let's Get Ready to Rumble: Crossover Versus Mutation Head to Head
Kumara Sastry, David Goldberg

A Systematic Study of Genetic Algorithms with Genotype Editing
Chien-Feng Huang, Luis Rocha

Self Adaptation of Operator Rates in Evolutionary Algorithms
Jonatan Gomez

GA14: Applications (10:30–12:10) **LOPEZ B** Chair: *Erik Goodman*

Metaheuristics for Natural Language Tagging
Lourdes Araujo, Gabriel Luque, Enrique Alba

Two-and-a-Half Evolutionary Codings of Rectilinear Steiner Arborescences
Bryant Julstrom, Athos Antoniades

Effectiveness of Genetic Programming and Genetic Algorithms in the Design of a Robust Saturated Controller
Andrea Soltoggio

Limit Cycle Prediction in Nonlinear Multivariable Systems Using Genetic Algorithm
Farzan Rashidi

ECI5: Design issues **WHIDBEY** Chair: *Rajkumar Roy*

Design Of Automotive Body Structures For Crashworthiness
Kazuhiro Saitou

Evolving Everyday Products: Rocket Science or Art
Shail Patel

Optimization Of Store Performance For Personalized Pricing Using Evolutionary Computation
Cem Baydar

BioApp3: Modelling, alignment, and more **ORCAS** Chair: *James A. Foster*

A Genetic Approach for Gene Selection on Microarray Expression Data
Yong-Hyuk Kim, Su-Yeon Lee, Byung-Ro Moon

Evolving Better Multiple Sequence Alignments
Luke Sheneman, James A. Foster

Systems Biology Modeling in Human Genetics using Petri Nets and Grammatical Evolution
Jason Moore, Lance Hahn

An Evolutionary Approach With Pharmacophore-Based Scoring Functions For Virtual Database Screening
Jinn-Moon Yang, Tsai-Wei Shen, Yen-Fu Chen, Yi-Yuan Chiu

Computer-Aided Peptide Evolution for Virtual Design
Belda Ignasi, Xavier Llora, Matinell Marc, Tarrago Teresa, Giralt: Ernest

LBP6 (10:30–12:30) **SAN JUAN** Chair: *Fernando Lobo*

Crossover and Mutation in Genetic Algorithms Using Graph-Encoded Chromosomes
Sam Stone, Brian Pillmore, Walling Cyre

Control Structures In Linear And Stack-Based Genetic Programming
Elko B. Tchernev, Dhananjay S. Phatak

Constraint Handling of an Optical Components Selection Problem using a new Genetic Crossover Scheme
Mohammad Amin, Malin Premaratne

EcoSFERES: A Tool for the Design of Self-Organized Agent-Based Applications
Stéphane Doncieux, Samuel Landau, Nicolas Guelfi

Developing Cooperation of Multiple Agents Using Genetic Network Programming with Automatically Defined Groups
Tadahiko Murata, Takashi Nakamura

Genetic Programming for Guiding Branch and Bound Search
Konstantinos Kostikas, Charalambos Fragakis

An Evolutionary Technique for Multicriterial Optimization Based on Endocrine Paradigm
Corina Rotar

A Grid-based Ant Colony System for Automatic Program Synthesis
Sergio A. Rojas, Peter J. Bentley

Wednesday June 30, 13:50 – 15:30

GA16: Techniques **EMERALD I** Chair: *Jürgen Branke*

Encoding Bounded-Diameter Spanning Trees for Evolutionary Search with Random Keys
Bryant Julstrom

Non-Stationary Subtasks can Improve Diversity in Stationary Tasks
Christopher Willis-Ford, Terry Soule

Modeling Dependencies Of Loci With String Classification According To Fitness Differences
Miwako Tsuji, Masaharu Munetomo, Kiyoshi Akama

Interactive One-Max Problem Allows To Compare The Performance Of Interactive And Human-Based GA
Chihyung Cheng, Alexander Kosorukoff

RWA8: Applications **EMERALD II** Chair: *Mike Cattolico*

Evolving Wavelets using a Coevolutionary Genetic Algorithm and Lifting
Uli Grasemann, Risto Miikkulainen

Genetic Lagrange Multiplier Optimization for Multi-Campaign Assignment Problem
Yong-Hyuk Kim, Byung-Ro Moon

A Generic Network Design for a Closed-loop Supply Chain using Genetic Algorithm
Eoksu Sim, Sungwon Jung, Haejoong Kim, Jinwoo Park

Automatic Synthesis of an 802.11a Wireless LAN Antenna using Genetic Programming
Rian Sanderson

Comp: Competitions **BAINDRIDGE** Competition chair: *Simon Lucas*
Session chair: *Maarten Keijzer*

Introduction to Competitions

Cellz: Overview and Results

Presentation from Cellz Winner (TBA)

NoisyDFA: Overview and Results

TinyGP: Overview and Results

Presentation from TinyGP Runner-Up

Presentation from TinyGP Winner

Discussion of Current and Future GECCO Competitions

AAAA5: Swarms   **LOPEZ A**   Chair: *Chris Monson*

Grammatical Swarm
Michael O'Neill, Anthony Brabazon

Adaptively Choosing Neighbourhood Bests using Species in a Particle Swarm Optimizer
Xiaodong Li

Better Spread and Convergence: Particle Swarm Multiobjective Optimization Using the Maximin Fitness
Xiaodong Li

The Kalman Swarm
Christopher Monson, Kevin Seppi

GA17: EDA and BOA   **LOPEZ B**   Chair: *W. B. Langdon*

Fitness Inheritance in the Bayesian Optimization Algorithm
Martin Pelikan, Kumara Sastry

Parameter-less Hierarchical BOA
Martin Pelikan, Tz-Kai Lin

PolyEDA: Combining Estimation of Distribution Algorithms and Linear Inequality Constraints
Joern Grahl, Franz Rothlauf

An Estimation of Distribution Algorithm Based on Maximum Entropy
Alden Wright, Riccardo Poli, Christopher Stephens, W. B. Langdon, Sandeep Pulavarty

ECI6: Panel   **WHIDBEY**   Chair: *Rajkumar Roy*

Panel Discussion On "Next Steps In Evolutionary Computation In Industry"

Coev2: Analysis, theory and MOO (13:50–15:05)   **ORCAS**   Chair: *Edwin de Jong*

Predicting Genetic Drift in 2×2 Games
Anthony Liekens, Huub ten Eikelder, Peter Hilbers

A Model Of Coevolutionary Genetic Algorithms On Two-Bit Landscape
Chang Ming

A Sensitivity Analysis of a Cooperative Coevolutionary Algorithm Biased for Optimization
Liviu Panait, R. Wiegand, Sean Luke

LCS2: Analysis and improvements   **SAN JUAN**   Chair: *Tim Kovacs*

Analysis And Improvements Of The Adaptive Discretization Intervals Knowledge Representation
Jaume Bacardit, Josep Maria Garrell-Guiu

Classifier Systems for Continuous Payoff Environments
Stewart Wilson

Improving MACS thanks to a comparison with 2TBNs
Sigaud Olivier, Thierry Gourdin, Pierre-Henri Wuillemin

System Level Hardware--Software Design Exploration with XCS
Fabrizio Ferrandi, Pier Luca Lanzi, Donatella Sciuto

Wednesday June 30, 15:50 – 17:30

GA18: Analysis and theory   **EMERALD I**   Chair: *Alden Wright*

A Polynomial Upper Bound for a Mutation-Based Algorithm on the Two-Dimensional Ising Model
Simon Fischer

Epistasis Measures for Detecting Independently Optimizable Partitions of Variables
Byung-Ro Moon, Dong-Il Seo, Sung-Soon Choi

The Royal Road Not Taken
Brian Howard, John Sheppard

Polynomial Approximation of Survival Probabilities Under Multi-Point Crossover
Sung-Soon Choi, Byung-Ro Moon

RWA9: Real world applications   **EMERALD II**   Chair: *Arthur Kordon*

Multiple Species Weighted Voting a Genetic-Based Machine Learning System
Alexander Tulai, Franz Oppacher

Object Oriented Design and Implementation of a General Evolutionary Algorithm
Robert Vanyi

An Informed Operator Based Genetic Algorithm For Tuning The Reaction Rate Parameters
Nicolae Mera, Lionel Elliott, Derek Ingham, Adrian Kyne, Mohamed Pourkashanian, Christopher Wilson

Biomass Inferential Sensor Based on Ensemble of Models Generated by Genetic Programming
Arthur Kordon, Elsa Jordaan, Lawrence Chew, Guido Smits, Torben Bruck, Keith Haney, Annika Jenings

ES3: Techniques   **BAINDRIDGE**   Chair: *Tobias Storch*

A Novel Multi-objective Orthogonal Simulated Annealing Algorithm
Shu Li-Sun, Ho Shinn-Jang, Ho Shinn-Ying, Chen Jian-Hung

Program Evolution by Integrating EDP and GP
Kohsuke Yanai, Hitoshi Iba

An Improved Diversity Mechanism for Solving Constrained Optimization Problems
Efren Mezura Montes, Carlos Coello Coello

Reducing Fitness Evaluations Using Clustering Techniques and Neural Network Ensembles
Yaochu Jin, Bernhard Sendhoff

LBP7 (15:50–17:35)   **LOPEZ A**   Chair: *Sean Luke*

A Philosophical Essay On Life And Its Connections With Genetic Algorithms
Fernando G. Lobo

An Application of Evolutionary Algorithms to Predict the Extent of SLHF Anomaly Associated with Coastal Earthquake
Guido Cervone, Liviu Panait, Ramesh Singh, Menas Kafatos, Sean Luke

Function Approximation by means of Multi-Branches Genetic Programming
Katya Rodriguez-Vazquez, Carlos Oliver-Morales

Equilibrium and Extinction In a Trisexual Diploid Mating System
Erik Buehler, Sanjoy Das, Jack F. Cully

Ant Colony Algorithms for Routing in Sensor Networks
Sanjoy Das, Gurdip Singh, Seep Pujar, Praveen Koduru

Enhancing A Multiobjective Evolutionary Algorithm Through Flexible Evolution
Daniel Salazar, Blas Galván, Gabriel Winter

Simple Incremental Testing
John Woodward

GA19: Techniques (15:50–17:05)   **LOPEZ B**   Chair: *Alberto Moraglio*

Clustering with Niching Genetic K-means Algorithm
Weiguo Sheng, Allan Tucker, Xiaohui Liu

Inducing Sequentiality Using Grammatical Genetic Codes
Ohnishi Kei, Kumara Sastry, Ying-ping Chen, David Goldberg

A Note on Classification with Scaled Genetic Algorithms in a Coevolutionary Setting
Lothar Schmitt

LBP8 (15:50–17:50)   **WHIDBEY**   Chair: *Stewart Wilson*

Organization Design Optimization Using Genetic Programming
Bijan KHosraviani, Raymond E. Levitt, John R. Koza

Navigation Using Inverting Genetic Algorithms: Initial Conditions and Node-Node Transitions
Steven J. Simske, David C. Matthews

Breeding Swarms: A GA/PSO Hybrid
Matthew Settles, Terence Soule

Evolutionary Music Composer
Yaser M.A. Khalifa, Hunter Shi, Gustavo Abreu

A Correlated Fitness Landscape Describes Growth in Experimental Microbial Ecosystems: Initial Results
Frederik P.J. Vandecasteele, Thomas F. Hess, Ronald L. Crawford

Association-Based Evolution of Comprehensible Neural Logic Networks
Henry Wai-Kit Chia, Chew-Lim Tan

Functional Modularity in the Test Bed of Economic Theory -- Using Genetic
Shu-Heng Chen, Bin-Tzong Chie

An Autonomous Agent-Based Surveillance System
Yaser Khalifa, Ehi Okoene

LBP9 (15:50–17:50)   **ORCAS**   *Chair: David Davis*

How to Draw a Straight Line Using a GP: Benchmarking Evolutionary Design Against 19th Century Kinematic Synthesis
Hod Lipson

Evolving Dynamic Gaits on a Physical Robot
Viktor Zykov, Josh Bongard, Hod Lipson

Relationship between Genetic Algorithms and Ant Colony Optimization
Osvaldo Gómez, Benjamín Barán

Understanding Competitive Co-evolutionary Dynamics via Fitness Landscapes
Elena Popovici, Kenneth De Jong

Lamarckian Repair and Darwinian Repair   in EMO Algorithms for Multiobjective 0/1 Knapsack Problems
Shiori Kaige, Kaname Narukawa, Hisao Ishibuchi

Exhaustive Directed Search
Sanza Kazadi, Daniel Johnson, Jhanisus Melendez, Brian Goo

On the Sampling Property of Real-parameter Crossover
Shin Ando, Shigenobu Kobayashi

Complementary Selection and Variation for an Efficient Multiobjective Optimization of Complex Systems
Benoit Bagot, Hartmut Pohlheim

LBP10 (15:50–16:50)   **SAN JUAN**   Chair: *Marc Schoenauer*

The Evolution of Genetic Regulatory Networks for Single and Multicellular Development
Sanjeev Kumar

Feature Selection and Classification in Brain Computer Interfaces by a Genetic Algorithm
Luca Citi, Riccardo Poli, Caterina Cinel, Francisco Sepulveda

Chemical Genetic Programming - The Effect of Evolving Amino Acids
Wojciech Piaseczny , Hideaki Suzuki , Hidefumi Sawai

A Highly Efficient Function Optimization with Genetic Programming
Joao Pujol, Riccardo Poli

ISGEC Membership Application

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(located on the back of your card, next to the account number)

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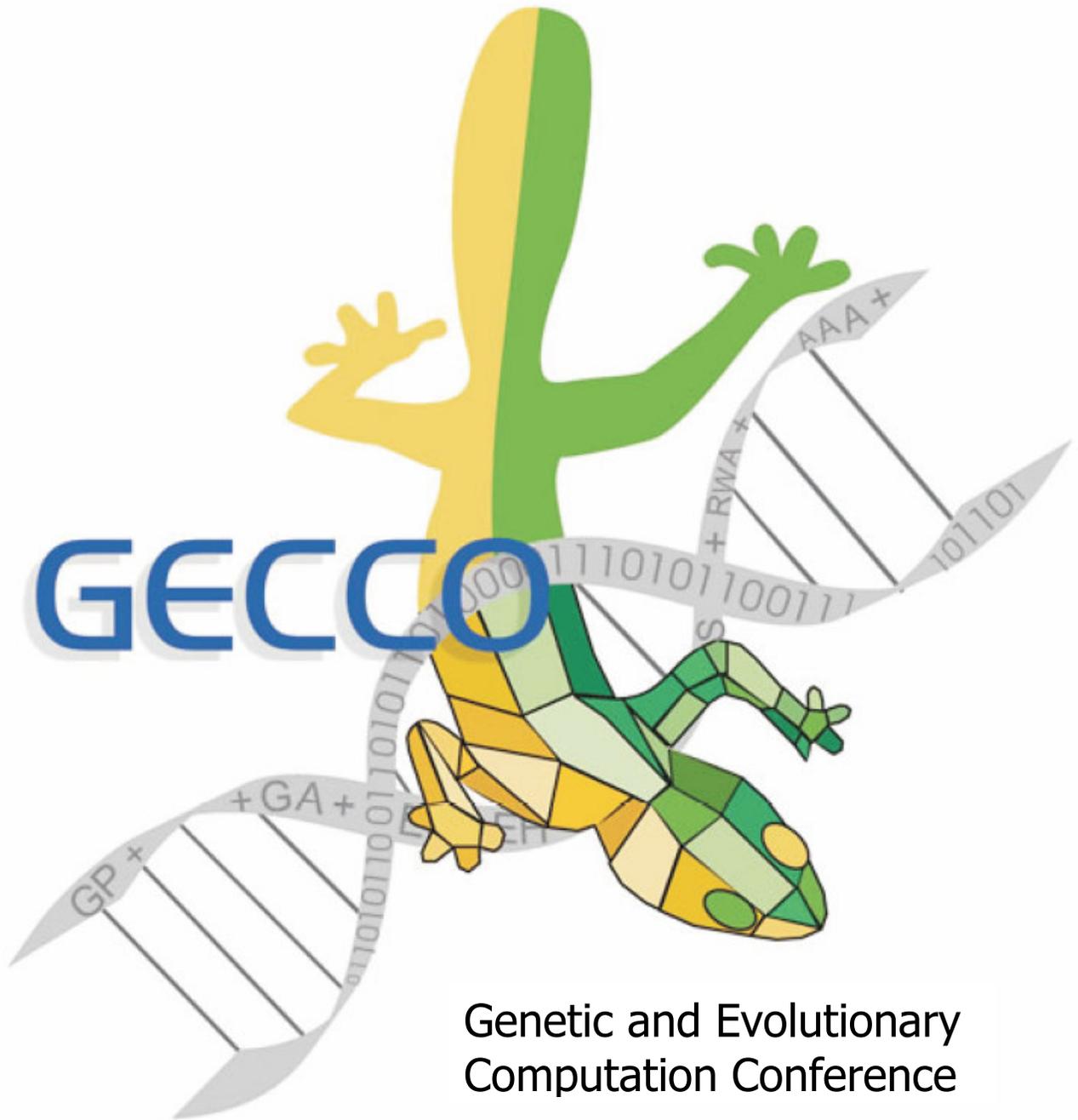
Genetic and Evolutionary Computation Conference

GECCO – 2005

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