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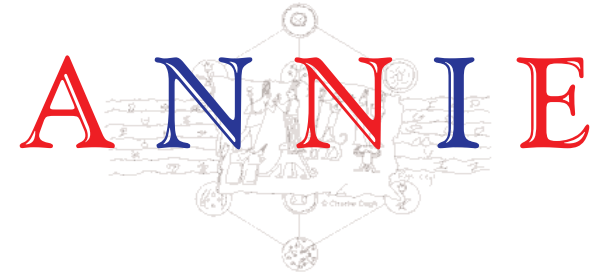
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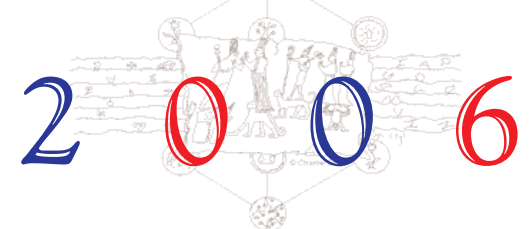
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ANNIE 2006  
Smart Engineering Systems Laboratory  
Department of Engineering Management and Systems Engineering  
1870 Miner Circle  
Rolla, MO 65409-0370, USA



November 5-8, 2006  
St. Louis Pavillion Hotel Downtown, St. Louis, Missouri  
<http://www.umn.edu/~annie>

Organizer  
UNIVERSITY OF MISSOURI - ROLLA  
Smart Engineering Systems Laboratory  
Department of Engineering Management  
and Systems Engineering



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ANNIE 2006 will be held on November 5 through November 8, 2006, at **St. Louis Pavilion Hotel Downtown in St. Louis, Missouri, USA**. This will be the sixteenth international gathering of researchers interested in Intelligent Systems Design using neural networks, fuzzy logic, evolutionary computation, swarm intelligence, and complex systems. The previous conferences each drew approximately 150 papers from twenty countries. The proceedings of all conferences were published by ASME Press as hardbound books in fifteen volumes. The last volume, edited by Dagli, et. al., was titled "Smart Engineering Systems Design: Neural Networks, Evolutionary Programming, and Artificial Life".

ANNIE 2006 will cover the theory of Computational Intelligence and Systems Engineering techniques, namely; neural networks, fuzzy logic, evolutionary computation, swarm intelligence, and complex systems. Presentations dealing with applications of these technologies are encouraged in the areas of: critical infrastructure, cyber security, home land security and defense, computational intelligence and nanotechnology, computational intelligence architectures, systems engineering, data mining, pattern recognition, control, informatics, financial engineering, and smart engineering systems.

## SPECIAL SESSIONS - TOPICS OF INTEREST

### Bio-Informatics and Computational Biology

The special session on Computational Bioinformatics at ANNIE 2006 will focus on the theory and applications of computational and machine learning approaches to problems from the fields of biology. Topics include, but are not limited to: genomics, proteomics, phylogeny and evolution, systems biology, biological databases, visualization, DNA computing, sequence analysis, and developmental Control.

### Infrastructure Systems Engineering

This session will cover the use of neural networks and computational intelligence techniques in Infrastructure Systems Engineering. Topics include, but are not limited to: Health Monitoring of Infrastructure Systems, Transportation Infrastructure Systems, Geomechanical and Geotechnical Systems, Environmental Systems, Traffic Engineering and Intelligent Transportation Systems, Structural Systems, Construction and Management of Infrastructure Systems, and Behavior of Infrastructure Systems Under Extreme Conditions.

### Geographically Structured Evolutionary Algorithms

This special session will examine the issues of geographically based EAs. Geographically based EAs place the members of the evolving population on a geographic structure that restricts the rate at which currently-best solutions can spread. These algorithms are inspired by biology, as choice of breeding partner in biological populations is restricted by the geography of the natural world. Examples of geographically based EAs include grid-based algorithms, some types of parallel GAs, and graph based EAs.

### Computational Public Health

This session will highlight the computational work being done in the application area of public health. The aspects of public health to be explored include disease modeling, disease spread modeling, and simulation and syndromic surveillance. The computational methodologies include, but are not limited to: artificial neural networks, genetic algorithms, fuzzy logic and reasoning, Bayesian networks, and statistical analysis. This session is directed primarily at the developers of the computational methodologies, but will also be of interest to public health professionals.

## TOPICS OF INTEREST

### Computational Intelligence Techniques

- Artificial Neural Networks
- Support Vector Machines
- Neuro-Dynamic Programming
- Reinforcement Learning

- Genetic Algorithms
- Evolutionary Computation
- Swarm Intelligence
- Immune Systems
- Artificial Life

- Fuzzy Logic and Systems
- Fuzzy Modeling
- Fuzzy Evolutionary Computation

### Complex Adaptive Systems

- Adaptive Control
- Dynamic Pattern Identification
- Chaos
- Fractals
- Wavelets
- Time Frequency Analysis
- Hybrid Systems
- Evolvable Hardware

### Data Mining

- Knowledge Discovery
- Distributed Data Mining
- Algorithmic Complexity and Scalability
- Rough Sets and Data Mining

### Applications of Computational Intelligence to:

#### Smart Engineering Systems

- Systems Engineering
- Biomedical Engineering
- Network Centric Systems
- General Engineering
- Manufacturing Engineering

#### Financial Engineering

- Risk Engineering and Management
- Financial Forecasting
- Decision Making

Papers and session proposals relevant to these or closely related topics are invited.

## CALL FOR CONTRIBUTED PAPERS

The organizing committee invites all persons interested in Intelligent Systems Design using neural networks, fuzzy logic, evolutionary programming, artificial life, complex systems, and data mining to submit papers for presentation at the conference. All papers accepted for presentation will be published in the conference proceedings, with a paid registration.

All papers will be refereed, for technical merit and content, by senior researchers in the field to assure a high-quality conference and proceedings, based on full paper submissions. Authors are requested to submit a letter of intent; an information sheet that includes the full name of the author(s), title, address, phone number, FAX number, E-mail and/or URL address; and an abstract (up to 200 words) by April 14, 2006.

Full papers are due by May 30, 2006. Authors will be notified of the status of their submittal by June 30, 2006. Camera-ready manuscripts will be due by July 31, 2006. Six pages will be allocated for each accepted paper in the proceedings. Authors should forward their letter of intent, information sheet, abstract, and full paper to:

Dr. Cihan H. Dagli  
Conference Chair  
Smart Engineering Systems Laboratory  
Systems Engineering Graduate Program  
University of Missouri - Rolla  
1870 Miner Circle  
Rolla, MO 65409-0370, USA

Phone: 573-341-6576  
FAX: 573-341-6268  
E-Mail: annie@umr.edu  
URL: <http://www.umr.edu/~annie>

## Algorithm Competition

### Binary Time Series Prediction Contest

All ANNIE 2006 conference participants are invited to enter a Binary Time Series Prediction Contest. Time series prediction is a standard task for computational intelligence techniques such as neural networks. An entry to the contest is a predictor with an interface written in C or C++: `int Next_Bit(int Current_Bit);` predictor will be scored on the ability to predict the next bit given the current bit for 20,000 bits, including 10,000 released for training. Training bits are available from Dr. Ashlock at the e-mail given below. The predictor may save bits internally. A brief description of the techniques used to create the predictor must accompany each entry. Entries should be sent to Dr. Daniel Ashlock, Department of Mathematics & Statistics, University of Guelph, Ontario, Canada, ([dashlock@ouguelph.ca](mailto:dashlock@ouguelph.ca)). No more than four submissions by any one entrant will be permitted. **Participants are invited to submit papers on their technique, which will be refereed in the usual conference manner. All entrants must be present at the conference to win.**

## AUTHORS' SCHEDULE

April 14, 2006 - Deadline for submission of paper abstract, information sheet, and letter of intent.

May 30, 2006 - Deadline for full papers.

June 30, 2006 - Notification of status of contributed papers.

July 31, 2006 - Deadline for camera ready manuscripts.

## KEYNOTE SPEAKERS

ANNIE 2006 is honored to have Dr. Ann Miller, UMR, Rolla, MO, USA, as the Banquet speaker. Dr Miller's presentation will be titled: "Security and Reliability of Autonomous, Intelligent Systems". Dr. Jamshid Ghaboussi, University of Illinois- Urbana will also speak as a keynote speaker. Dr. Ghaboussi will present "Advances in Biologically Inspired Soft Computing Methods in Structural Engineering and Computational Mechanics" for the Infrastructure System Engineering Track. Suggestions of other possible speakers should be made to the conference chair.

## AWARDS

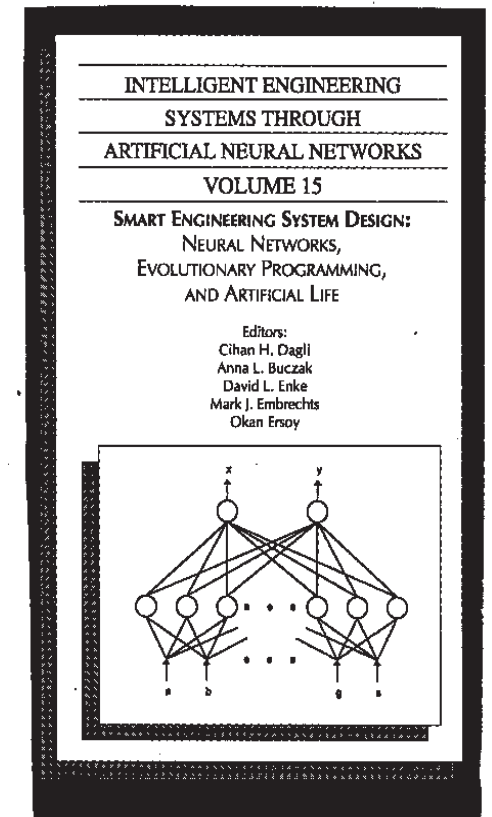
ANNIE 2006 is planning to present a Best Paper Award, with best technical merit, to the authors of two papers, one in each of the areas of "Novel Smart Engineering System Designs" and "Theoretical Developments in Computational Intelligence". All winners will be invited to submit their papers for consideration in the *International Journal of General Systems*.

## EXHIBITORS

Book companies, research institutions, and book vendors are invited to participate in the ANNIE 2006 Exhibition to be held November 6 through November 8, 2006. For further information, please contact the conference chair.

## CONFERENCE PROCEEDINGS

Papers submitted to the conference will be reviewed by two referees and all accepted papers will be published as a hardbound book by ASME Press and edited by Drs. Dagli, Buczak, Embrechts, Enke, and Ersoy. A copy of the book will be given to each participant at the conference. After the conference, the book will be available from the publisher.



## ORGANIZING COMMITTEE

### Conference Chair

Prof. Cihan H. Dagli, Engineering Management and Systems Engineering, University of Missouri - Rolla

### Conference Co-Chairs

Dr. Anna Buczak, Sarnoff Corporation  
Prof. Mark J. Embrechts, Decision Sciences and Engineering Systems, Rensselaer Polytechnic Institute  
Prof. David Enke, Engineering Management and Systems Engineering, University of Missouri - Rolla  
Prof. Okan Ersoy, Electrical and Computer Engineering, Purdue University