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# Evolvable Components

From Theory to  
Hardware Implementations



Springer

# Evolvable Components From Theory To Hardware Implementations Natural Computing Series

**Peter Van Emde Boas, Jaroslav  
Pokorný, Mária Bieliková, Julius Stiller**



## **Evolvable Components From Theory To Hardware Implementations Natural Computing Series:**

**Evolvable Components** Lukas Sekanina, 2003-10-23 At the beginning of the 1990s research started in how to combine soft computing with reconfigurable hardware in a quite unique way One of the methods that was developed has been called evolvable hardware Thanks to evolutionary algorithms researchers have started to evolve electronic circuits routinely A number of interesting circuits with features unreachable by means of conventional techniques have been developed Evolvable hardware is quite popular right now more than fifty research groups are spread out over the world Evolvable hardware has become a part of the curriculum at some universities Evolvable hardware is being commercialized and there are specialized conferences devoted to evolvable hardware On the other hand surprisingly we can feel the lack of a theoretical background and consistent design methodology in the area Furthermore it is quite difficult to implement really innovative and practically successful evolvable systems using contemporary digital reconfigurable technology

**Evolvable Systems: From Biology to Hardware** J. Manuel Moreno, Jordi Madrenas, Jordi Cosp, 2005-09-19 The flying machines proposed by Leonardo da Vinci in the fifteenth century the self-reproducing automata theory proposed by John von Neumann in the middle of the twentieth century and the current possibility of designing electronic and mechanical systems using evolutionary principles are all examples of the efforts made by humans to explore the mechanisms present in biological systems that permit them to tackle complex tasks These initiatives have recently given rise to the emergent field of bio-inspired systems and evolvable hardware The inaugural workshop Towards Evolvable Hardware took place in Lausanne in October 1995 followed by the successive events of the International Conference on Evolvable Systems From Biology to Hardware held in Tsukuba Japan in October 1996 in Lausanne Switzerland in September 1998 in Edinburgh UK in April 2000 in Tokyo Japan in October 2001 and in Trondheim Norway in March 2003 Following the success of these past events the sixth international conference was aimed at presenting the latest developments in the field bringing together researchers who use biologically inspired concepts to implement real systems in artificial intelligence artificial life robotics VLSI design and related domains The sixth conference consolidated this biennial event as a reference meeting for the community involved in bio-inspired systems research All the papers received were reviewed by at least three independent reviewers thus guaranteeing a high quality bundle for ICES 2005

**Evolvable Systems: From Biology to Hardware** Sanyou Zeng, 2007-08-26 This book constitutes the refereed proceedings of the 7th International Conference on Evolvable Systems ICES 2007 held in Wuhan China in September 2007 The 41 revised full papers collected in this volume are organized in topical sections on digital hardware evolution analog hardware evolution bio-inspired systems mechanical hardware evolution evolutionary design evolutionary algorithms in hardware design and hardware implementation of evolutionary algorithms

**SOFSEM 2004: Theory and Practice of Computer Science** Peter Van Emde Boas, Jaroslav Pokorný, Mária Bielíková, Julius Stiller, 2003-12-22 This book constitutes the refereed proceedings of the 30th Conference on Current Trends in Theory and Practice of

Computer Science SOFSEM 2004 held in Mern Czech Republic in January 2004 The volume presents 10 invited lectures and 22 full papers selected from 136 submissions Among the topics covered are computer science theory programming theory database systems information systems cognitive technologies and Web technologies Bio-Inspired Technologies for the Hardware of Adaptive Systems Mircea Gh. Negoita, Sorin Hintea, 2009-03-24 Evolvable Hardware EHW has emerged as a sub domain of artificial evolution represented by a design methodology consortium of methods involving the application of Evolutionary Algorithms EA to the synthesis of digital and analogue electronic circuits and systems Nevertheless the most benefit for the society and indeed most revolutionizing application of EA is its hardware implementation leading to the EHW These new EA based methodologies led to a new type of machines that is evolved to attain a desired behaviour which means they have a behavioural computational intelligence EHW is a special case of the adaptive hardware namely being strongly related to the Adaptive Systems AS and the Adaptive Hardware AH The book presents a careful selection of the field that very well reflects the breadth of this high technology and its terminology and applications in context of the AS AH The harmonious symbiosis of the engineering approach and the accurate scientific methodology features the aspects of highly relevant and practical design principles governing the development of EHW and its connections with AS AH This book is both attractive and useful for everybody interested in the design and analysis of EHW in context of AS AH and implementation of real time adaptive hardware hybrid intelligent systems *Proceedings, 11th IEEE International Conference and Workshop on the Engineering of Computer-Based Systems* Vaclav Dvorak, Miroslav Sveda, 2004 *Evolvable Hardware* Martin A. Trefzer, Andy M. Tyrrell, 2015-09-14 This book covers the basic theory practical details and advanced research of the implementation of evolutionary methods on physical substrates Most of the examples are from electronic engineering applications including transistor level design and system level implementation The authors present an overview of the successes achieved and the book will act as a point of reference for both academic and industrial researchers 4th NASA/DoD Conference on Evolvable Hardware (EH 2002) Adrian Stoica, 2002 The purpose of this conference is to bring together leading researchers from the evolvable hardware community representatives of the automated design and programmable reconfigurable hardware communities technology developers and end users from the aerospace military and commercial sectors The focus of EH 2002 is evolvable hardware for safer systems **International Aerospace Abstracts** ,1999 **Stanford Bulletin** ,1998 **Electrical & Electronics Abstracts** ,1997 Index to Theses with Abstracts Accepted for Higher Degrees by the Universities of Great Britain and Ireland and the Council for National Academic Awards ,2007 **Government Reports Announcements & Index** ,1996 *Proceedings of the Texas Conference on Computing Systems* ,1973 Government Reports Announcements ,1973 Proceedings of the ... International Joint Conference on Artificial Intelligence ,1997 Index to IEEE Publications Institute of Electrical and Electronics Engineers, 1987 Issues for 1973 cover the entire IEEE technical literature *Dissertation Abstracts International* ,2004 *Library & Information*

*Science Abstracts* ,1993

**Computer & Control Abstracts** ,1996

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