



# *Comparing and Contrasting FPGA and Microprocessor System Design and Development*

*By: Karen Parnell, Roger Bryner*

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Programmable Logic Devices offer a cost effective alternative to custom microprocessors due to their generic nature with the added benefits of short time-to-market, no NRE costs, off-the-shelf availability, ability to control inventory in peak and trough times, and ability to reduce total cost of ownership over the lifetime of an end product.

Microprocessor obsolescence is a major concern for many companies. Programmable logic can provide a viable solution to this problem. By using soft core microprocessors embedded within a programmable logic device, not only can you own the processor core for use in any future devices and platforms, but the design can be both flexible and scalable to suit different platforms.

This paper compares and contrasts FPGA and microprocessor system design and development flows with the aim of helping the designer and definer of state-of-the-art electronics systems to make a considered and well-informed architecture decision. The first part of the paper introduces Xilinx and PLDs to people new to programmable logic. Next, the paper describes the benefits PLDs can bring to total cost management, technical advantages of PLDs, and microprocessor design flows and methodologies. The paper then discusses future trends, the use of soft core microprocessors, and how these can be used to mitigate against processor obsolescence.

# Comparing And Contrasting Fpga And Microprocessor System

**Marcelo Lubaszewski, Vladimir Castro  
Alves**



## **Comparing And Contrasting Fpga And Microprocessor System:**

Rapid System Prototyping with FPGAs R. C. Cofer, Benjamin F. Harding, 2011-03-31 The push to move products to market as quickly and cheaply as possible is fiercer than ever and accordingly engineers are always looking for new ways to provide their companies with the edge over the competition Field Programmable Gate Arrays FPGAs which are faster denser and more cost effective than traditional programmable logic devices PLDs are quickly becoming one of the most widespread tools that embedded engineers can utilize in order to gain that needed edge FPGAs are especially popular for prototyping designs due to their superior speed and efficiency This book hones in on that rapid prototyping aspect of FPGA use showing designers exactly how they can cut time off production cycles and save their companies money drained by costly mistakes via prototyping designs with FPGAs first Reading it will take a designer with a basic knowledge of implementing FPGAs to the next level of FPGA use because unlike broad beginner books on FPGAs this book presents the required design skills in a focused practical example oriented manner In the trenches expert authors assure the most applicable advice to practicing engineers Dual focus on successfully making critical decisions and avoiding common pitfalls appeals to engineers pressured for speed and perfection Hardware and software are both covered in order to address the growing trend toward cross pollination of engineering expertise

**Annual Meeting of the North American Fuzzy Information Processing Society--NAFIPS.** North American Fuzzy Information Processing Society. Annual Meeting, 2005

**Advanced Computer and Communication Engineering Technology** Hamzah Asyrani Sulaiman, Mohd Azlishah Othman, Mohd Fairuz Iskandar Othman, Yahaya Abd Rahim, Naim Che Pee, 2015-12-28 This book covers diverse aspects of advanced computer and communication engineering focusing specifically on industrial and manufacturing theory and applications of electronics communications computing and information technology Experts in research industry and academia present the latest developments in technology describe applications involving cutting edge communication and computer systems and explore likely future trends In addition a wealth of new algorithms that assist in solving computer and communication engineering problems are presented The book is based on presentations given at ICOCOE 2015 the 2nd International Conference on Communication and Computer Engineering It will appeal to a wide range of professionals in the field including telecommunication engineers computer engineers and scientists researchers academics and students

*ASEAN Engineering Journal*, 2011

*Pattern Recognition in Bioinformatics* Jagath C.- Rajapakse, Bertil Schmidt, Gwenn Volkert, 2007-09-19 This book constitutes the refereed proceedings of the International Workshop on Pattern Recognition in Bioinformatics PRIB 2007 held in Singapore in October 2007 The 38 revised full papers presented were carefully reviewed and selected from 125 submissions The papers discuss the applications of pattern recognition methods in the field of bioinformatics to solve problems in life sciences

*Advanced Intelligent Computational Technologies and Decision Support Systems* Barna Iantovics, Roumen Kountchev, 2013-08-04 This book offers a state of the art collection covering themes related

to Advanced Intelligent Computational Technologies and Decision Support Systems which can be applied to fields like healthcare assisting the humans in solving problems The book brings forward a wealth of ideas algorithms and case studies in themes like intelligent predictive diagnosis intelligent analyzing of medical images new format for coding of single and sequences of medical images Medical Decision Support Systems diagnosis of Down s syndrome computational perspectives for electronic fetal monitoring efficient compression of CT Images adaptive interpolation and halftoning for medical images applications of artificial neural networks for real life problems solving present and perspectives for Electronic Healthcare Record Systems adaptive approaches for noise reduction in sequences of CT images etc

**Field-Programmable Custom Computing Technology: Architectures, Tools, and Applications** Jeffrey Arnold, Wayne Luk, Ken Pocek, 2012-12-06 Field Programmable Custom Computing Technology Architectures Tools and Applications brings together in one place important contributions and up to date research results in this fast moving area In seven selected chapters the book describes the latest advances in architectures design methods and applications of field programmable devices for high performance reconfigurable systems The contributors to this work were selected from the leading researchers and practitioners in the field It will be valuable to anyone working or researching in the field of custom computing technology It serves as an excellent reference providing insight into some of the most challenging issues being examined today

**Multimedia Multiprocessor Systems** Akash Kumar, Henk Corporaal, Bart Mesman, Yajun Ha, 2010-09-11 Modern multimedia systems are becoming increasingly multiprocessor and heterogeneous to match the high performance and low power demands placed on them by the large number of applications The concurrent execution of these applications causes interference and unpredictability in the performance of these systems In Multimedia Multiprocessor Systems an analysis mechanism is presented to accurately predict the performance of multiple applications executing concurrently With high consumer demand the time to market has become significantly lower To cope with the complexity in designing such systems an automated design flow is needed that can generate systems from a high level architectural description such that they are not error prone and consume less time Such a design methodology is presented for multiple use cases combinations of active applications A resource manager is also presented to manage the various resources in the system and to achieve the goals of performance prediction admission control and budget enforcement

**FPGA ... , 2007**

**Advances in Intelligent Analysis of Medical Data and Decision Support Systems** Roumen Kountchev, Barna Iantovics, 2013-02-11 This volume is a result of the fruitful and vivid discussions during the MedDecSup 2012 International Workshop bringing together a relevant body of knowledge and new developments in the increasingly important field of medical informatics This carefully edited book presents new ideas aimed at the development of intelligent processing of various kinds of medical information and the perfection of the contemporary computer systems for medical decision support The book presents advances of the medical information systems for intelligent archiving processing analysis and search by content which will improve the quality of the

medical services for every patient and of the global healthcare system The book combines in a synergistic way theoretical developments with the practicability of the approaches developed and presents the last developments and achievements in medical informatics to a broad range of readers engineers mathematicians physicians and PhD students

**Journal of VLSI Signal Processing Systems for Signal, Image, and Video Technology**, 2007

**Microcomputer Design and Construction** Alan Clements, 1982

Active Pages Mark Henry Oskin, 2001

**Electronic Troubleshooting, Fourth Edition** Daniel R. Tomal, Aram Agajanian, 2014-04-22 The Most Complete Current Guide to Troubleshooting and Repairing Electrical and Electronic Devices If it's electronic and there is troubleshooting to be done then this is the book to reach for Dr Simon Monk bestselling author of 30 Arduino Projects for the Evil Genius and Hacking Electronics An Illustrated DIY Guide for Makers and Hobbyists an outstanding book on electronic troubleshooting with clear concise and concrete examples that anyone can relate to James Karagiannes Ph D Physics Associate Dean of Engineering and Information Sciences DeVry University Chicago Fully updated for the latest technologies devices test instruments and problem solving methods the new edition of this practical resource provides you with the comprehensive information you need to troubleshoot today's electrical and electronic equipment Inside you'll find new and enhanced coverage of Wireless communications Embedded microprocessor systems Cutting edge medical diagnostic equipment Advanced networking technologies The book uniquely blends traditional electrical theory and components with modern networking and electronic technology Chapter ending questions and problems test your understanding of the topics discussed Filled with tables charts illustrations graphs and flowcharts this is a must have manual for anyone who works with electronics at home or on the job

**Electronic Troubleshooting Fourth Edition** covers Electric motors and generators Industrial controls Residential commercial and wireless communications Radio and television Digital circuits Combinational and sequential digital circuits Microprocessor based systems Biomedical equipment Computer networking and network drives Embedded microprocessor systems

**Field-programmable Logic and Applications**, 2002

**XI Brazilian Symposium on Integrated Circuit Design** Marcelo Lubaszewski, Vladimir Castro Alves, 1998 Topics in this book on integrated circuit design include hardware software codesign of embedded systems the ALFA HUERTA project rapid prototyping digital testing and digital design

Eighth IEEE International Symposium on Computers and Communication, 2003 ISCC 2003 focuses on all aspects of computers communications and service provisioning over the enhanced global telecommunications networks The proceedings covers comprehensive topics in research and applications areas such as network reliability and quality of service wireless cellular and mobile communications mobile ad hoc networks distributed systems control and optimization of communication systems and security privacy and information access

**Dedicated Digital Processors** F. Mayer-Lindenberg, 2004-02-13 Publisher Description

*Proceedings*, 1996

International Conference on Transparent Optical Networks, 2001

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