

FPGA Resource Estimation

Detailed estimations and calculations indicate as to which amount existing FPGA resources are being used by individual design components and image processing operators. Thus, it is very easy to locate design elements with high resource consumption, so-called 'hot spots', instantly and to optimize the design at these places accordingly.

Bandwidth Analysis

The required bandwidth of each individual transport link is calculated by the program's data throughput analysis function. Links which need to have their bandwidth (re)adjusted are highlighted. For all links of the design, detailed information stating available and required bandwidth is displayed on mouse over.

Simulation

A pixel-accurate image processing simulation allows testing of the functionality of the designed application. Input modules (for feeding in test images or test image sequences) and output modules (for fetching the calculated visual results) can be placed on any spot of the design.

Event Control

With VisualApplets® 2, it is possible to program event control mechanisms on FPGAs. The user can define that in specific situations that might arise on the FPGA during processing, events are to be generated by the application. These events are handed over to a connected software control by an implemented mechanism in real time. Thus, CPU-consuming polling processes are no longer necessary.

Parameterization at Runtime

In the process of developing the FPGA design, the user can define which parameters can be modified after the applet's implementation at runtime. These parameters can be (re)set, during runtime, by using the SDK or the microDisplay tool. This allows for a comfortable, software-based real-time control.

Build Process

As soon as a design is ready, an executable FPGA applet can be created via mouse click. In this build process, VisualApplets automatically makes use of the previously installed Xilinx Place&Route software.

Implementation Using microDisplay

Using the configuration and preview program microDisplay, the user can monitor the runtime behavior of the FPGA applet in real-time, visually adapt and configure the image processing behavior of the applet, and save the complete system environment to a configuration file.

SDK Code Generator

Together with the build of the FPGA code, an individual software example is automatically generated to ease implementation into a software application. The parameterizable interfaces are listed and embedded into a programming environment for image acquisition, memory management and image transfer.

3rd Party Libraries

Functional interfaces to 3rd party image processing software like VisionPro® (Cognex), LabVIEW (National Instruments), HALCON (MVTec), CVB (STEMMER IMAGING) and MIL (Matrox) are available - FPGA applications created with VisualApplets® can be implemented into almost all conceivable image processing systems.

ADDRESS SiliconSoftware GmbH
 Steubenstraße 46
 D-68163 Mannheim
 Germany/Deutschland

SiliconSoftware Inc.
 1 Tara Boulevard, Suite 200
 Nashua, NH 03062
 USA

CONTACT Phone: +49.621.789 507-0
 Fax: +49.621.789 507-10
 EMail: info@silicon-software.de

Phone (USA): +1 603 324 7172
 Fax (USA): +1 603 324 7101
 EMail (USA): americas@silicon-software.com

INQUIRIES Inquiries DACH
 EMail: vertrieb@silicon-software.de
 Phone: +49.621.789 507-39

Inquiries EMEA and APAC
 EMail: sales@silicon-software.de
 Phone: +49.621.789 507-39

Inquiries The Americas
 EMail: americas@silicon-software.com
 Phone: +1.603 324 7172

INFORMATION Support
 EMail: support@silicon-software.de
 EMail: support@silicon-software.com



VisualApplets® Graphical FPGA Programming for Real Time Applications



Enjoy the new, graphical approach to FPGA programming!

VisualApplets offers intuitive programming and easy access to realtime image processing applications. No VHDL or Verilog knowledge is required to program FPGAs with VisualApplets. Designs of hardware programming consist from flow charts by combining image processing modules. Libraries of VisualApplets offer more than 200 modules. The creation of own modules and libraries is possible.

For Developers

Reducing CPU Load

The use of FPGAs in machine vision results in an enormous reduction of CPU load. With the rapid development of new sensors, images of higher and higher resolution can be acquired at continually increasing speed. CPUs and even GPUs are no longer able to handle the resulting enormous amounts of data. The solution lies in employing FPGAs. Preceding the CPU in the data processing chain, they fulfill a variety of image processing tasks such as image optimization, data interpretation, or creation of control signals. Thus, the load of CPU/GPU can be reduced significantly.

FPGA Programming for Everybody

Since VisualApplets® provides a GUI for programming, VHDL knowledge is not required to program FPGAs. Thus, this is no longer a task exclusively for hardware programmers, but can also be accomplished by software developers or machine vision experts.

Graphical Application Development

Programming with VisualApplets® is done by designing flow charts. The user models the data flow of the individual image processing solution by combining image processing modules (operators) and interconnecting transport links simply via Drag & Drop.

Team Functionality

VisualApplets® offers a broad range of team work functions. In addition, members of the project team can communicate their ideas to each other without having to tackle any programming language issues.

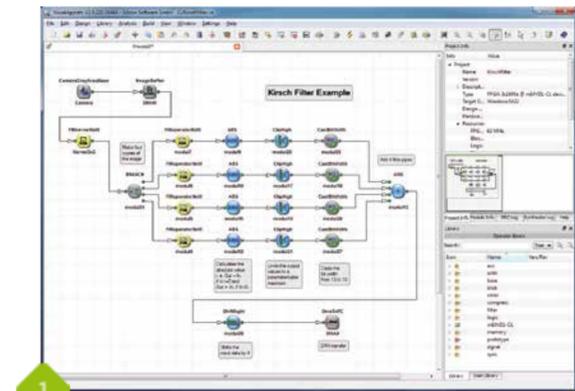
Operators and Libraries

For defining image processing solutions, more than 200 operators are available. Each operator offers a specific image processing function within the image processing chain. Operators can be freely combined and linked to meet a specific image processing task. They are grouped by theme into 13 libraries.

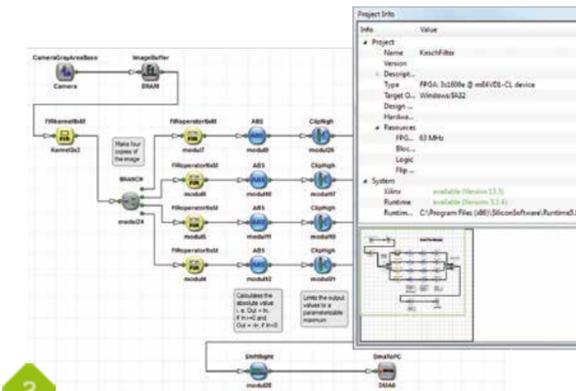
Design Rules Check and Visual Debugging

Using the two-level design rules check, the user can verify if the new application conforms to the basic combination and parameterization rules of VisualApplets®. Error analysis and debugging are closely intertwined, thus allowing comfortable visual debugging; Errors are listed as links, and clicking on an error message leads the user directly to the position where the design shows the reported defect.

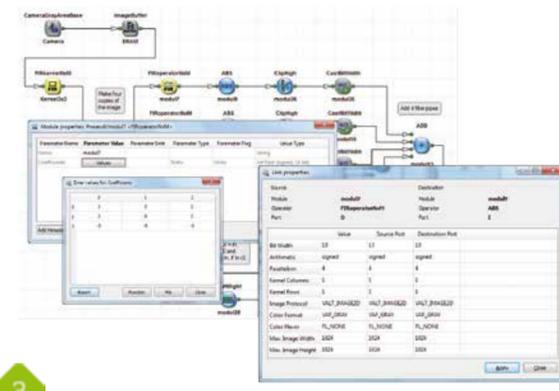
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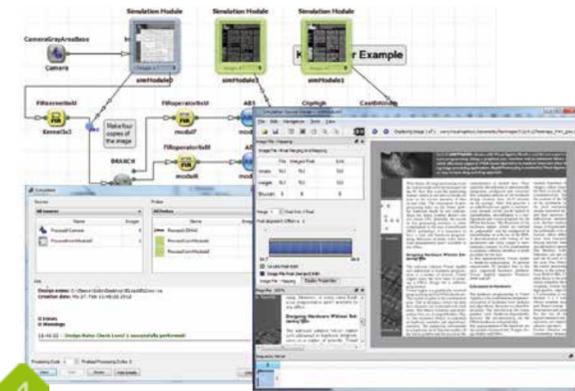
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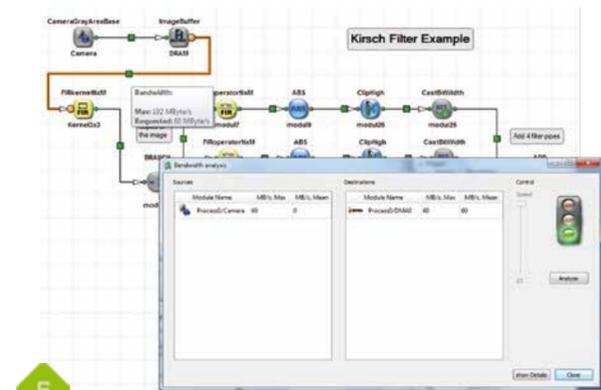
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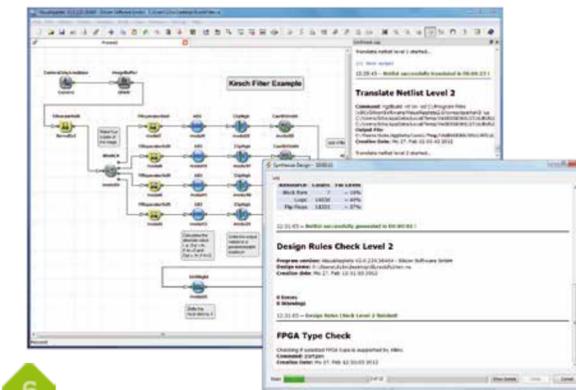
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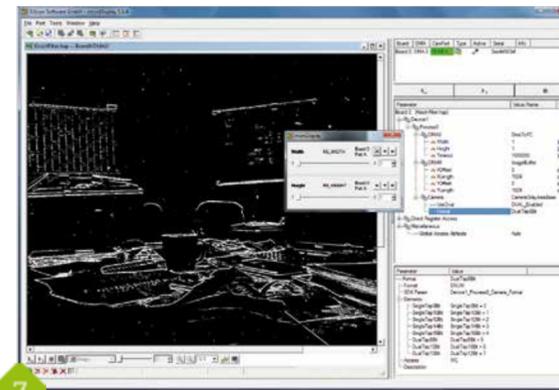
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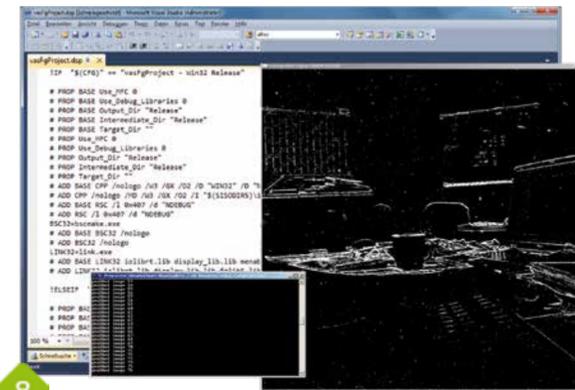
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For Deciders

Accelerating Time-to-Market

With VisualApplets®, projects are realized much faster - the graphical, high-level approach makes FPGA programming quick and simple. The resulting hardware code is immediately ready-to-use in the system. A high-level simulation shows the hardware behavior and helps to minimize integration time. The result is a timely and easy integration into factory automation.

No Staff Shortages

Software developers or application engineers can do it - no hardware programming knowledge is required to program FPGAs with VisualApplets. A fast learning curve supports a smooth integration in company workflow due to intuitivity of GUI and design method. A broad range of crossdepartmental team work functions helps to integrate hardware and software programmers.

Rapid Return of Investment

VisualApplets offers low startup investment costs. FPGA technology guarantees a long product life cycle of developed applications since they can be re-fined and adjusted via re-programming. The maintenance costs decrease hereby. The modular design concept in VisualApplets eases a re-use of designs; a high partability enable a change of hardware platform in minutes; already existing VHDL code can be optionally imported. code can be optionally imported.

Protection of Intellectual Property

The design of individually developed image processing solutions is always protected by conversion into binary code. Unauthorized use of applets can be prevented by restricting the executability of individual applets to certain, pre-defined FPGAs. In these cases, an applet developed by the customer or on behalf of the customer will only run on FPGAs approved by the customer.

Services

Documentation and Online Tutorial

Comprehensive documentation provides information for all audiences and is also available as context-sensitive online help which can be accessed directly from within the program. A live link leads to the online version of the documentation that is updated on a regular basis:
<http://www.siliconssoftware.de/va2.html>

Face-to-Face

Silicon Software offers a broad range of services such as workshops, tutorials, and coaching that deal with implementation and usage possibilities of VisualApplets®. Development services that speed up the development of customer-specific applications complete the product portfolio. Get information on upcoming events from your local distributor or directly from Silicon Software.

- Design creation by flow chart diagrams
- Resource estimation of the design
- Design parameterisation
- High level simulation and preview of the visual result
- Bandwidth estimation of the design
- Design rule check performance
- Live preview and configuration in microDisplay
- Embedding in SDK project