



Microprocessor Interfacing Laboratory

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Goals

1. Replace aging hardware with modern alternatives.
2. Reduce maintenance difficulties by switching from custom hardware to easily replaceable, commercial products.
3. Increase the flexibility of the equipment to support greater freedom in design projects.

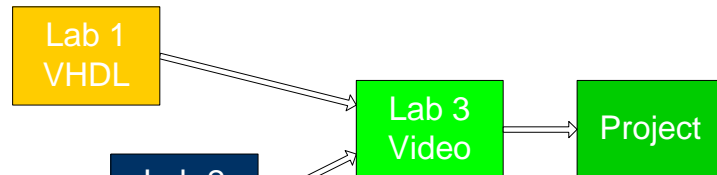
Changes

1. Embedded Intel 80386EX board replaced by a HP iPAQ PDA running Linux.
 - a. Linux is open-source, providing easy access to any portions of the OS used in the course.
 - b. Students have previous experience with Unix platform.
2. All custom hardware replaced by an XESS XSV-300 FPGA prototyping board.
 - a. Can purchase replacements if repairs not feasible.
 - b. Wide array of functions supported that are not all used during structured labs.

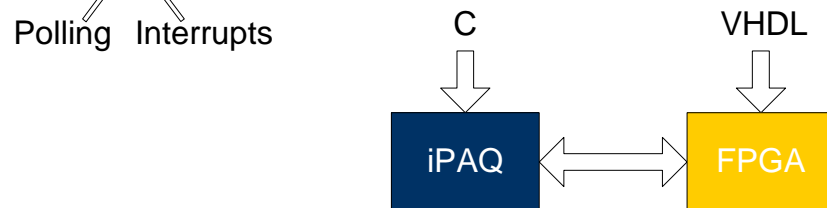
Accomplishments

1. Selected equipment that would meet specified goals.
2. Developed a suitable iPAQ Linux installation and convenient access to iPAQs from desktop computers in the lab.
3. Developed 3 structured labs that cover VHDL, interfacing with the iPAQ via PCMCIA, and video-in/VGA-out.

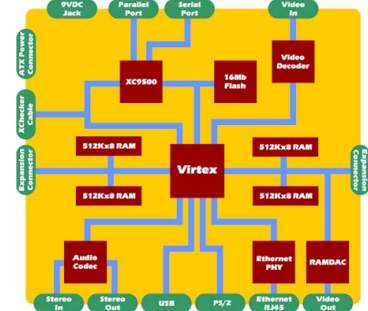
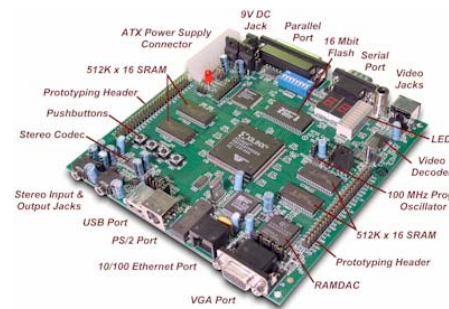
Course Flow



Design Flow

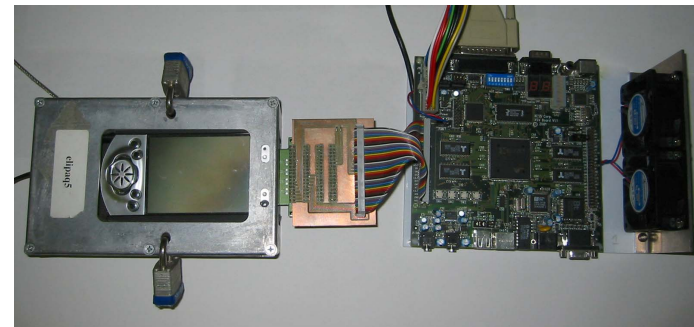


XSV FPGA Board



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Lab Station



Student Projects

1. Audio applications
2. Games
3. 3-D video

Lessons Learned

1. iPAQs have proven quite reliable in a student laboratory setting.
2. SRAM chips on XSV-300 boards have been prone to overheating due to incorrect enable signals.
3. Complexity of XSV-300 leads to difficult troubleshooting and repair.
4. XESS has discontinued XSV boards, but have replaced them with comparable boards that use SpartanIIe FPGAs.