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A Franz Inc. Customer Success Story

American Microsystems, Inc.

NETRANS™: FPGA to ASIC Migration Software for the Semiconductor Industry

American Microsystems, Inc. (AMI), an internationally leading semiconductor company supplying Application Specific Integrated Circuits (ASICs) to the electronics industry, uses Allegro CL's ANSI-standard Common Lisp in its tool suite, Access Design Tools™.

"Access is a Lisp environment with an extensive set of tools that AMI uses to manipulate, process and check integrated circuit (IC) information says Bob Kirk, CAD Research Manager. "Unlike other applications that are limited to a collection of individual programs, Access is a Lisp environment that integrates a number of tools using shared code. It is a collection of engineering tools the company uses to process design information from our customers." Kirk continues: "since IC design data is processed electronically, there are a number of steps that need to happen. Access accomplishes this through an extensible environment for quick and easy customization in a rapidly changing market."

NETRANS Converts FPGA to ASIC Design

One of the tools in the Access Design Tool suite is NETRANS, used to convert a customer's Field Programmable Gate Array (FPGA) to an optimized ASIC design. "There are many reasons why a customer might want to make this conversion," says Kirk. "By far the most common is to substantially reduce costs. FPGAs can be really large chips," he explains. "There is a lot of silicon and a lot of pins, but often the same design can be implemented using a minimal amount of silicon with fewer pins. FPGAs can sell for as much as several hundred dollars each while AMI can

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CAD Research Manager, AMI

produce equivalent ASIC chips for as little as ten to fifteen dollars each in volume."

Designers prefer to prototype with FPGAs due to lower up-front costs and faster turn-around times. They avoid the ASIC tooling expense and the risk that the first effort is wrong thereby paying to re-tool all over again. "Designers develop a low-risk, low-cost prototype of something that works and then they bring it to us for inexpensive mass production."

Allegro CL's Common Lisp Gives AMI Advantages Over Competition

Allegro CL's Common Lisp is instrumental in maintaining the competitive edge of the Access Design Tools. "Our requirements are constantly changing," says Kirk. "Lisp allows us to respond more quickly and efficiently than our competition. We also find Allegro CL to be a more productive environment than others we have used before. It is well integrated into the mainstream-computing world and offers excellent cross-platform support. The big advantage for us is that we can write more code with fewer people. Those familiar with software engineering know that when you have too many people involved on a project, it becomes unproductive. With Lisp, we can maximize our results with a minimum number of programmers.

"To illustrate my point about how quickly our needs change in this industry," continues Kirk, "NETRANS came into being back in 1987 when we developed design netlist translators using traditional programming languages. Typically, it took about six months to get a translator in place. That window was big enough that we often lost customers. Our big break came with the development of NETRANS in Lisp. Due to the advantages of Lisp, we were able to set up a translator in about two hours. Then, our sales people could say, 'yes, we can do that,' because the capability would be available in a matter of hours."

Kirk cites the dynamic extensible behavior of Allegro CL as the key to NETRANS' success. "Incremental program development permits us to rapidly assemble programs from reusable code modules. The data structures, which in many ways are very simple, are incredibly more powerful than what other programming languages offer. We also get what we call a very rapid edit-compile-debug loop in the Lisp environment."

For more information about AMI, please visit their web site at: http://www.amis.com.

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