



For Immediate Release

University of Illinois Wins MEMOCODE 2013 Design Contest Using Convey HC-Series

--Second Year in a Row Convey System Used for Winning Entry--

Richardson, Texas, January 30, 2014 – Convey Computer today announced that a student and advisor at the University of Illinois at Urbana-Champaign, Department of Computer Science, won first place in the 2013 MEMOCODE Conference¹ design contest. Using a Convey HC-1™, the team's stereo matching design solution was selected as the pure-performance winner, achieving top honors in the Accuracy-Adjusted Performance Category.

Experts from all segments of the commercial and academic world took part in the month long contest, using a variety of design tools, hardware and software. The competition addressed a common challenge in computer vision—stereo matching. Similar to how humans use two eyes to determine depth perception, stereo matching uses a stereo image pair to infer depth information for each pixel in the computer image. Stereo matching is used in a variety of industries such as entertainment, information transfer and automated systems for applications involving computer-generated imagery (CGI), medical imaging, geographic mapping, surveillance, and robotics.

Participants in the contest were given a stereo image pair and asked to use Belief Propagation (BP) on a Markov Random Field (MRF) model to infer the depth information for each pixel in the image. The contest focused on the optimization step using BP because it was the most computationally demanding.

Jungwook Choi, a Ph.D. student in the Department of Electrical and Computer Engineering, used the Convey HC-1 as the accelerator for his stereo matching application. Convey's hybrid-core architecture pairs classic Intel® x86 microprocessors with a coprocessor comprised of field-programmable gate

¹The winners presented their methods at the 11th ACM/IEEE International Conference on Formal Methods and Models for Codesign, October 18-20, 2013 in Portland, Oregon. <http://memocode.irisa.fr/2013/>

arrays (FPGAs). Particular algorithms are optimized and translated into code that's loadable onto the coprocessor at runtime. The result is order of magnitude performance increases with less power, space and cooling requirements.

Implementing a Maximum A Posteriori (MAP) inference method known as TRW-S, Choi was able to demonstrate superior performance and comparable quality. Choi's winning design utilizes TRW-S as the core inference engine for matching, outperforming BP in MRF inference. Experimental results demonstrate a speed of 12 frames per second for challenging video stereo matching tasks.

"People run TRW-S when they want an excellent and reliable answer, but they don't run it when they want a fast answer, since it's computationally intense," explained Rob A. Rutenbar, Professor and Head of CS at the university. "It's quite extraordinary that we can run Choi's implementation at video rates."

The win by the University of Illinois in 2013 marks the second year in a row that an entry has won the MEMOCODE design contest using a Convey HC-1 hybrid-core system. Iowa State University won first place in the 2012 MEMOCODE contest with their fast exact-match short-read aligner.

"Convey Computer congratulates Jungwook Choi, Rob Rutenbar and the University of Illinois for this remarkable accomplishment," concluded Bruce Toal, CEO of Convey. "Our hybrid-core technology is being used by others to accelerate a variety of applications; we appreciate that the MEMOCODE Conference design contest helps us highlight the achievements of these talented individuals and exceptional universities."

About Convey Computer Corporation

Convey breaks power, performance and programmability barriers with the world's first hybrid-core computer—a system that marries the low cost and simple programming model of a commodity system with the performance of a customized hardware architecture. Using Convey hybrid-core systems, customers worldwide in industries such as life sciences, research, big data, and the government/military are enjoying order of magnitude performance increases. <http://www.conveycomputer.com/>

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