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An award-winning combination

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An award-winning combination

Summary: What do a software engineer for a major company, a professor of computer science and a comic book artist have in common? Their computer science expertise and research produced an award-winning paper at an international computer science conference.

(October 23, 2008)-What do a software engineer for a major company, a professor of computer science and a comic book artist have in common? Besides their affiliation as alumni and faculty of the University of Minnesota, Morris (UMM), the three combined their computer science expertise and research to produce an award-winning paper at an international computer science conference.

Tyler Hutchison ’07, Brian Ohs ’08 and Nic McPhee, UMM professor of computer science, researched and co-authored a paper on Genetic Programming (GP). Hutchison and McPhee jointly presented the paper during the EuroGP 2008 conference in Naples, Italy, and garnered the Best Paper Award for the team’s efforts.

“I started doing research work because I wanted some experience, a challenge, and I heard a bit about GP and thought it would be interesting,” said Ohs. “A couple years later and I'm co-author on a 2008 Best Paper award winner. Getting to that point isn't easy and it is something that doesn't just 'happen.' It takes a lot of time, effort and dedication to get there.”

“Students with whom I've worked have won previously at the regional level,” said McPhee. “However, this is at the international level and most of those attending the Naples conference just assumed that Tyler was a graduate student.”

Earning an opportunity to present at the conference was rigorous, shared McPhee: “EuroGP is one of a handful of major international conferences in genetic programming held worldwide each year. Only 34 out of 100 of the submitted papers were accepted. These papers were authored by graduate students and experienced researchers, some with decades of experience. This was the only accepted paper co-authored by undergraduate students. Of the 34 accepted papers, only seven were nominated for best paper. Of those seven, our paper was voted best by the conference attendees, a group of nearly 200 of the most prominent researchers in the field.”

What is genetic programming?

Hutchison said that it is “not difficult to understand, but it is a rather foreign idea to most people and kind of abstract. Imagine being asked to build the tallest and the strongest building on earth. You probably have some ideas of how to make a building that will be really tall, and probably some ideas of how to make a building that will be strong but you may not know the best way to make a building that is both tall and strong. People can use critical thinking and come up with a few designs that will have both of the required properties. But a computer can randomly generate a million, maybe a billion, maybe a trillion different designs for buildings, some of them really good some not so good. It can then look at all these individual buildings and measure which ones are the tallest and the strongest, then 'mate' the best buildings from the population by mixing and matching parts of each parent building and creating a 'child' building. The computer has just created a new generation of designs for buildings.”

“We don't understand all the nuances of how GP works,” added Hutchison, “and how randomly mixing and matching parts eventually constructs a good solution to a problem, but it does. Our paper investigates what is really going on during this whole process and how parts combine.”

“We brought our findings to the eyes of the world, “ said Ohs, who, although unable to attend the conference, played an equally significant role in the research and preparation. “I believe we helped to pave the way for future work to both better understand and hopefully improve genetic crossover operations. This is very exciting, as genetic programming has had numerous successes in everything from programming soccer-playing robots to the design of satellite antennae to predicting changes in the stock market.”

“Just as students who, for example, perform each year with renowned jazz musicians during UMM’s legendary Jazz Fest, students who present before and receive feedback from experts at the conference level gain confidence,” said McPhee. “To do research teaches a student about how science—or whatever field—works. To publish at this level tells students a lot about what they can do. Then to win an award of this caliber, it’s a pretty cool deal.”

Ohs and Hutchison chose diverse careers following their graduation from UMM, which also speaks to the value of the liberal arts education that UMM offers its students.

Ohs, a software engineer for Trane, Inc., said, “I'm part of a very high-profile project in the company and have stepped in to take over some of the work of a 10-year veteran engineer. I feel that the self-motivation that it takes to excel at UMM, especially in research work, has helped me to stand out as a self-starting individual, willing and able to think on my feet. I also feel that the abilities I learned and discovered I had due to the caliber of work expected for UMM research helped prepare me for the demands of the workforce.”

“I used to work as a software engineer for an online game company and also worked as a user interface developer for a small start up [company] in Minneapolis,” shared Hutchison. “At the moment I am gainfully unemployed and using my time to make more comics and work on applications for grad school to continue research in genetic programming.”

“For me, comics and computer science kind of go hand in hand,” added Hutchison. “My programming notebooks are just filled with drawings and doodles of how a program is going to work.” Hutchison is working on “an adventure Web-comic that is updated every Tuesday-Thursday (http://www.tylersaurus.com), a sci-fi mystery graphic novel set on Mars in the year 1967 and an educational comic textbook that will explain the basics of Genetic Programming.” He already created a comic to distribute during the conference “so people could follow along and they would have a nice little pamphlet to help them remember the presentation.”

Graphic: Tyler Hutchison applied his comic book artistry to create this rendition of himself, McPhee and Ohs riding on a mythical Geneticorn.