



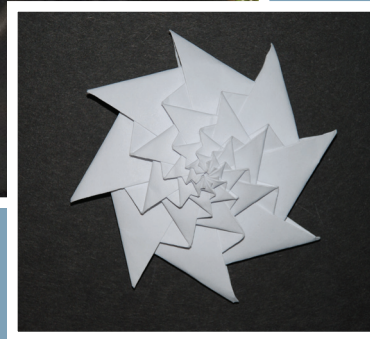
Brian Nakayama
2013-14 Pragmatics Fellow

IOWA STATE UNIVERSITY

Department of Computer Science

Pragmatics Fellowship

The Pragmatics Fellowship in Computer Science was established by Dr. Long Nguyen to attract high potential students to the PhD program in Computer Science at ISU. This year's fellowship has been awarded to Brian Nakayama (BS 2013, Regis University). Brian's research interests are broad, including computing architecture, compilers, and universal computation. He spent summer 2013 learning about DNA nanoscale technologies with the LANS Laboratory at ISU.



Brian folded this complicated origami structure (left) during the interview for this report. Origami, he says, is a good example of the creative and algorithmic character of mathematics. His motivation to pursue the PhD is due to his enjoyment of the mathematics of computing and the discrete logic upon which modern computing works.

Perhaps modeled in his origami structure (above), **beautiful patterns of interactions** seem to be characteristic of Brian's past and future interests and research work. His honors thesis at Regis University was on Universal Computation in the Prisoner's Dilemma Game. "He has written a beautiful program that color codes the strategies so you can watch successful strategies propagate in real time," says his undergraduate thesis advisor, James Seibert. A simulation can be viewed and the program can be downloaded from Brian's website, www.briannakayama.com. Other faculty who have taught Brian remarked, "he is very engaged in exploration and discovery. He uses [concepts] he learned in one course to help support and deepen his understanding and explanations in another." With such high recommendations, we were happy that he chose ISU as his new academic home and we look forward to seeing how Brian builds new patterns of interactions among research areas, new ideas, and with people.

When it comes to ideas, Brian seems to embody the CS department tagline, **All Science is Computer Science**. "My research, both academic and independent, so far covers too wide a breadth and leaves me with more questions than answers at this point," he says. "I am interested in ways that computers can reveal information about the world around us. Simulations with predictive power, such as Continuous Time Markov Chains for the rates of binding and dissociating of DNA domains, can help us create more efficient nanotechnology. Other simulations create insight into what already exists, such as cellular automata emulating relationships found in nature. In the future, I hope to understand and perhaps model other things such as reconfigurable computers." His long goals for the future involve both industry and academia. "As an industry researcher, I hope to solve problems in a focused environment; however, I do not plan on living my whole life in industry. At some point I desire to be an educator. I envision myself as a professor with a coffee mug in one hand and a dry erase marker in the other. I want the opportunity to invest myself in the well-being of others, teaching them to see the world through the lens of a computer scientist."

Brian is grateful for the Pragmatics Fellowship. "Without funding like this, I likely would have gone to industry either before attending or during graduate education. The award is substantial enough to pay for small equipment with expediency. Thus if I need a Field Programmable Gate Array or a Raspberry Pi, I have an immediate source of funds upon which I can rely. Of course, these funds also provide a safety net for the unlucky grad student whose computer decides to crash." The award is not purely "pragmatic," however, for Brian. "Besides the many advantages related to money, I also feel a sense of trust, given to me by those who awarded it. The award itself means a lot to those with computer science degrees who pursue academia in a quest for self-fulfillment against all financial logic and reason. For future students, I hope the award will push more hopefuls to become educators."