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NMSU Computer Science to help improve STEM curricula with NSF grant

Four New Mexico State University graduate students, along with four Las Cruces Public School teachers, will begin work this school year on a 3-year, $1.5 million grant awarded by the National Science Foundation to the NMSU Department of Computer Science in an effort to educate a new generation of students in ways of computational thinking.

The grant will support the GK-12 Discover Science Through Computational Thinking (DISSECT) program, led by Enrico Pontelli, Computer Science department head; Jonathan Cook, of Computer Science; Susan Brown, Director of the STEM Outreach Center in the NMSU College of Education; and Jessica Haebe, program coordinator. The program aims to integrate computer science and computational methods into traditional sciences. To do so, graduate student fellows will be paired with practicing teachers, to create dynamic partnerships. Fellows and teachers will work together over the course of the year to discover new educational tools and methodologies, as well as impact the lives of K-12 students by helping them gain confidence and mature problem solving skills.

“This program is a great opportunity for us to give back to the Las Cruces community,” Haebe said. “It’s also a great way for our graduate students to get some real-world experience, and to get young students interested in the sciences.”

One key goal of the *DISSECT* program is to revitalize interest and preparation in STEM in general, and Computer Science in particular, as K-12 student interest and success in STEM remains low and interest in Computer Science has plummeted since 2000. Fellows and teachers will accomplish this task by infusing computational thinking and computational methods in traditional STEM classes at the middle school and high school levels, and increasing teachers’ effectiveness in STEM coursework.

“Computational thinking enables students to make develop their problem solving skills by using computers in ‘building’ solutions to problems,” Pontelli said. “This project will push our local schools into a new dimension, providing students with new tools to succeed and new sources of excitement and engagement.”

The innovative *DISSECT* approach to involving students in STEM curricula incorporates the use of computational concepts, such as robotics applications to physics and engineering and artificial intelligence used to analysis biological data. In the GK-12 model, STEM curricula are not presented as independent disciplines, but as a dynamic instrument of scientific reasoning and problem solving. Computer Science is introduced to students not as a separate discipline, but as a problem-solving methodology with real world applications.

“Teaching science and Computer Science in this way puts students on the cutting-edge of the science fields,” Haebe said. “Computational problem solving is a very important skill. We live in a world in which all science has become computer science.”

The *DISSECT* approach offers many benefits to program fellows and K-12 teachers as well. From this experience, graduate fellows will come to see a broader vision of Computer Science research, learning how their research can be transformative in other domains, and become equipped with the skills to communicate their research ideas to different audiences, including students, teachers, and researchers, all of which are vital skills necessary in academia.

“We’re working with the next generation of college professors here, and we want them to be at the forefront of this scientific migration,” Haebe said.

Graduate fellows also will receive a two-year $30,000 stipends, as well as funds for additional educational expenses.

Participating K-12 teachers also benefit from opportunities to receive training in using computational methods in their classrooms as well as the opportunity to work side by side with domain experts from different areas of Computer Science. Teachers will receive a one or two-year $5,000 stipend from participating in the program.

For more information about the GK-12 DISSECT program, please visit www.cs.nmsu.edu/gk-12 or contact Jessica Haebe at jhaebe@nmsu.edu or (575) 646-6365.

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*Heather Lang 09/08/2010*