Wiggins includes all students in diversity programs

If an engineering freshman hasn't heard of Aurles Wiggins, director of the Diversity Programs Office in the College of Engineering, that usually isn't the case for long.

Wiggins has no problem tracking students down to make sure they start college off on the right foot—whether they like it or not. "I'm really intrusive and I don't take prisoners. I just tell students what they have to do," she says with a laugh. But, the students know it's true.

Nathaniel Edwards, electrical engineering sophomore, has known Wiggins for more than a year. He says, "Dr. Wiggins is very business-oriented, but she still jokes around and you know she loves you too."

Wiggins has been advising students in the Diversity Programs Office (formerly known as the Engineering Equal Opportunity Program) since 1987 when she started out as a part-time graduate assistant and academic adviser. She "worked her way through the trenches" and in 1994 moved into her current position as director of diversity programs and assistant to the dean for diversity.

The purpose of the diversity office was originally to recruit, retain and graduate traditionally under-represented minorities. Today, that mission has expanded to include all students in the College of Engineering.

"The diversity initiative is not an ethnic issue. It's not a black and white issue," she says. "Today the mission is addressing diversity from a work-force, work-place position."

When Wiggins started out, she wasn't motivated to working in diversity. Her passion was focused on working with students and student development. "I like the energy of students, and I love being in a position where I can put resources in front of students that will allow them to grow, and to mature, and to develop," she says.

Wiggins grew up in Greensboro, North Carolina. She received a bachelor of science in psychology and a master's degree in counseling and guidance, both from North Carolina Agricultural and Technical State University. Her first job after college, working with developmentally handicapped children, gave her the motivation to go for a Ph.D., which she received in counseling and psychology from MSU.

She says that earning her Ph.D. was worth the extra time and money. "There are a number of advantages a person has when they develop themselves academically within their career," she says. "It is a professional tool. It says that you have trained yourself, you know how to do research and you know how to think and problem-solve."

Those skills have helped Wiggins a lot in her current position, she says. An average day on the job usually varies quite a bit. Wiggins is involved in a number of university committees including an administrative group and an affirmative action committee, which have regular meetings. There are also staff meetings once a week and diversity-related conferences that she attends.

If none of the above is scheduled Wiggins says she comes into work ready to reply to her mail and get all her paperwork done, but a lot of times a student will come in who needs to talk. "Of course I put everything else aside and work with the student, which is what I really enjoy," she says.

Wiggins has established many goals for the Diversity Programs Office. She would like to increase the number of students participating in international travel, study abroad and co-op programs. Another ongoing goal involves the Guided Learning Center, which is the part of the Diversity Programs Office that allows students to study and interact with others. Wiggins says, "I want the Guided Learning Center to function more on student energy. It should be a depot where students can come to meet other students and support academic excellence."

Edwards visits the Guided Learning Center often to study and he says it offers a great learning environment. "I feel like I have three mothers and a big sister to watch over me here," he says. "The diversity office is a place to come if you have trouble with life, homework, anything. You can come here and they will give you the correct information about what to do, or who to call."

While Wiggins keeps track of a student population of approximately 485, she tends to work more aggressively with the first- and second-year students than with the juniors and seniors. However, that is starting to change. She says, "Older students still need someone kicking their behinds."

Wiggins says that a lot of the things she does are personality driven. "Students expect me to be wild and crazy, and to yell and scream. They can count on that because through all of it they know that I care about what they are doing, and I will show them if I think they are headed down a wrong path."

The hardest part of Wiggins' job is "to see students fail in spite of all that has been presented to them." There is too much offered at this university for a student to fail, she adds.

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Q&A

Last year, the College of Engineering was proud to have an impressive three representatives on the Homecoming court. That record was topped, however, as four engineering seniors took center field at the Homecoming football game this past October.

Karun Naga and Tammy Townsend, mechanical engineering, Heather Dalby, computer engineering, and Tyson King, electrical engineering, all said that being on the court was a great opportunity. These are a few of the things they had to say about their experience:

Q: Why did you want to be a representative on the court?
A: I have a tremendous amount of Spartan pride. Homecoming appeared to be an opportunity to share this pride. -Naga
A: When I was 10 years old, my dad brought my little brother and me to our very first MSU Homecoming game. I remember looking down at the Homecoming court members on the field hoping that one day I’d be doing the exact same thing at this university. -Townsend

Q: What makes you a good representative of MSU?
A: I love this university and I have tried to show that in my student activities by giving back some of what the school has done for me. -Dalby
A: As a leader I not only have the ability to guide and teach, but also to work with and learn from others. -Townsend

Q: What was your favorite part of the weekend?
A: Riding in the parade and seeing all the little kids waving, sitting on the curbside. -King
A: The pep rally on the IM East field after the parade. I felt I was part of something very special. -Naga

Q: What do you think of the fact that the 1997 court had four engineers?
A: I think that four engineering students on the court only begins to show the true dedication, motivation, and leadership skills present in each and every engineering student at MSU. -King
A: MSU has great reason to be proud of the College of Engineering and its students. Opportunities like Homecoming are a great chance for this university to realize and acknowledge this. -Dalby

The third edition of Introduction to Environmental Engineering, authored by Mackenzie Davis, associate professor of environmental engineering and David Cornwell, former associate professor of environmental engineering at MSU, has just been released. The textbook is published by McGraw-Hill as part of its Water Resources and Environmental Engineering Series.

Written with the college sophomore in mind, Introduction to Environmental Engineering gently eases students into the technical aspects of water resource management, pollution prevention and control, and solid and hazardous waste reduction and treatment. Davis and Cornwell have integrated two recurring themes throughout their book: the use of mass balance equations for environmental problem-solving, and the use of waste minimization strategies to assist in pollution control. Chapters include hydrology, water treatment, water quality management, wastewater treatment, noise pollution, solid waste management, hazardous waste management, and ionizing radiation. There is also an introductory section that provides an overview of the field of environmental engineering, as well as its associated legislation, regulations, and ethics concerns. The book is used in the courses CE 280 (Introduction to Environmental Engineering), CE 483 (Water and Wastewater Treatment), and CE 485 (Solid and Hazardous Waste Management).

The cover of the textbook—a spruce-bordered cove reminiscent of the many glacial lakes of northern Michigan—was created in watercolor by the sister of Susan Masten, associate professor of environmental engineering. Students in Davis’s spring CE 485 class selected the painting from four possibilities.

The book has been adopted by 52 institutions in the United States and more than 20,000 copies of the second edition have been sold. The third edition of Introduction to Environmental Engineering can be found in the MSU Bookstore later this fall.

Engineering seniors are lion’s share of ‘97 Homecoming court

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1997 MSU Homecoming Court

Back row (l-r): Heather Dalby (CPE), Tim Perry, Justin Burkhart, Karun Naga (ME), Tammy Townsend (ME);

Front row (l-r): Susan Locking, Adam Herringa, Ra Quel Shavers, Tyson King (EE), Kerry Brainard
CNN Visits MSU Biomechanical Design Research Lab

MSU’s Biomechanical Design Research Laboratory gained national and international exposure when Robert Hubbard, professor of materials science and mechanics, and affiliated graduate students and researchers were featured on “CNN Headline News” this October. Hubbard and his students explained the methods they are using to design new seating standards for the automotive industry. The project is a collaborative effort of Michigan State University and the University of Michigan, and is funded by automobile manufacturers and seat suppliers through the Society of Automotive Engineers.

Robots are taught to ‘think’ for themselves

Last May, when a computer named Big Blue defeated Russian grandmaster Gary Kasparov in chess’s six-game championship finale, the world was suitably stunned. They’ve finally done it, we all concluded. They’ve finally programmed a computer who can outplay—who can out-think—the world’s greatest chess player. That same day, Sridhar Mahadevan, a robotics expert who recently joined the faculty of the Department of Computer Science, had his eye on a friendly game of backgammon instead.

“IBM had programmed Big Blue to play chess well,” tells Mahadevan, a former research scientist with IBM’s T.J. Watson Research Center. “They had computer science people working with chess experts. They even had a grandmaster, who provided the computer with very sophisticated kinds of openings and moves. That’s one way of building a super-intelligent program,” he notes. “You put in all this knowledge and the computer will play well.”

But there was another effort that didn’t get the publicity Big Blue received, and according to Mahadevan, is far more promising for the field of artificial intelligence. “There is a computer that actually learns to play backgammon,” he explains. “Nobody programmed it, or put in all those expert moves. Instead, they only provided the rules of the game, and the computer has learned to play against itself.” The backgammon-playing computer is now one of the top two or three players in the world.

And that—in a microchip—is what Mahadevan’s research is about: autonomous learning. Mahadevan wants to develop a general framework from which a robot, or a computer, or any “autonomous agent” can work to complete a certain task—whether the goal is winning a backgammon game, or cleaning a hotel room, or finding signs of life on Mars.

Mahadevan is developing this framework, or algorithm, so that it can be used in three different applications. One application will be for a search engine on the Web, where the task might be to find the best purchase price for a certain brand of software; a second application will be for a manufacturing plant control system, where the task may be to develop the most efficient manufacturing and servicing schedule for a given part; and the third application will be for a robot, which might be asked to locate a certain person or landmark in the Engineering Building.

“We’re getting to a point where we really can build these computer programs that can learn, and that can learn to a level better than humans can,” says Mahadevan.

The way the autonomous agent learns to accomplish fairly complex tasks is by first learning to accomplish the “lower layer” ones—such as not bumping into walls—and
Robot story continued

then combining all of those smaller tasks to achieve a greater goal. For example, a 16-year-old who is first learning to drive a car is conscious of every time she depresses the accelerator, shifts gears, or changes lanes. Once she has been at the wheel for a while, however, she is no longer compelled to fixate on the minutia of driving, but is free to contemplate other, more meaningful things—from where to eat dinner, to how to bring peace to the Middle East.

Programming each and every behavior, layer by layer, is one way of accomplishing these goals, Mahadevan acknowledges. A better way, however, a way that would enable the agent to improve upon itself better than a human could conceive, is to allow it to figure things out on its own.

“One of the big lessons that the computer community has learned is that we have to have much more flexible means of programming,” says Mahadevan. Mahadevan says that this flexibility is best gained through reinforcement. He “rewards” the agent when it has done something right and “punishes” it if it does something wrong. The agent can review the multiple moves that it took to accomplish the outcome and fine-tune its behavior accordingly.

Mahadevan says that autonomous agents are already popping up everywhere, and are soon to become more prevalent in our day-to-day lives. A hospital in Connecticut has a robot that can deliver meals to individual patients. There are now “learning elevators” that can determine the optimum service schedule for passengers. And in Anthony Hall—yes, right in our own neighborhood—there is a floor cleaner that is able to navigate the hallways entirely on its own.

“I think we’re moving toward an increasingly automated society where a lot of things will be under the control of computers,” says Mahadevan, citing such examples as toll booth operation and cleaning. “And there are a lot of mundane tasks out there that if we can get a robot to do them, people won’t have to. We will be better off because we can do more creative kinds of tasks—tasks that require our brain.”

Mahadevan’s laboratory is equipped with two robots that he brought with him from his previous position with the University of South Florida. Georgios Theocharous, a Ph.D. student and Lynn Ryan, a master’s student, also accompanied him to continue their research studies.

Diversity story continued

Fortunately, failure isn’t as common as success. Wiggins says that she knows she has been able to help students achieve their goals. “I know I have made a difference to students because they tell me,” she says. “Parents come to me and say, ‘I have heard my child talk about you. I can count on knowing that you are there to watch over (them) because I am not.’”

Kyhia Bostic, computer engineering sophomore, says that Wiggins has helped her to get focused on college and stay that way. “She is encouraging me to study abroad, she has found me a scholarship program, and she has helped me look at career goals.” Bostic knows that Wiggins wants students to take advantage of all their opportunities.

Working with students doesn’t stop in the office for Wiggins. She serves as an associate faculty adviser for a number of student groups including the Society of Hispanic Professional Engineers, American Indians In Science and Engineering, the National Society of Black Engineers, and the National Organization of Black Chemists and Chemical Engineers.

“I love being in a position where I can put resources in front of students that will allow them to grow, and to mature, and to develop.”

-Aurles Wiggins Diversity Programs Office director

Wiggins is also a board member for the Detroit Area Pre-College Engineering Program, which brings high school students to MSU for four weeks in the summer to get a taste of college life while learning about engineering. “It gets the students to start thinking beyond high school,” she says.

As far as reaching all of her career goals Wiggins says that her family has been a main inspiration to her. Every generation of women since her great-grandmother has attended college and valued education. “I didn’t realize it until I was in college, but that is pretty significant. They were strong, forward-thinking, very intelligent, creative women,” she said.

Now, Wiggins’ close family consists of her son Antoine, 21, daughter Ciera, 7, and a new fiancee. She instills the value of education in her children as well, which seems to be a big theme in both her personal life and her career. Wiggins seems to know this.

“There is nothing more important than education,” she says.