

Bridging the gap between engineering and art

By Alex Seise



*[Media Credit: Courtesy of Yunfeng Wang]
DJ Bot uses a spinning platform to create a
circular work of art.*

Though you will not see their works on display in the Guggenheim any time soon, robots are indeed staging an invasion of the art world.

Currently, a little piece of this takeover is happening here at the College. The Artbot project is an assignment for students taking the mechatronics course under the direction of course-creator Yunfeng (Jennifer) Wang, assistant professor of mechanical engineering.

For this assignment, students create a mechatronic device, which is a robotic appliance that combines aspects of mechanical, software and electrical engineering into a single machine that can perform programmed tasks. In this assignment, each robot must include a microcontroller with a mini built-in computer, two different sensors and two motors. However, there is a catch.

Each robot must also be able to create an original work of art as its specific programmed function.

Students may use any materials they see fit to create their robot, though most opt for simple, easily obtained supplies. From design to construction, to artwork creation, the project is entirely hands-on.

Students are evaluated and graded based on their Artbot's design concept, physical appearance, quality of construction, artistic output and physical properties, among other things.

"Most mechanical students don't think about art," Wang said. "This (project) bridges between art and engineering knowledge."

The College is not able to claim robotic art as its own because it has its roots elsewhere. Eduardo Kac, a leading pioneer in the robotic art field said in an article in the Art Journal, "As artists continue to push the very limits of art, traditionally defined by discrete and inert handmade objects, they introduce robotics as a new medium at the same time that they challenge our understanding of robots - questioning our premises in conceiving, building and employing these electronic creatures."

While the College's contributions are most notable in the field of visible works, robots have also been able to create musical pieces based on pre-programmed knowledge.

Demonstrations of each College-created robot are seen at the end of the year at the annual Celebration of Student Achievement in Armstrong Hall.

This past year's festivities were filled with designs that spanned the mechatronic world.

Some projects included Artie the Circle Bot (which created designs reminiscent of those drawn with Spirograph toys), Foo Bot (which used an elaborate system of lateral and longitudinal coordinates to draw a staircase pattern) and DJ Bot (which used wire prongs to move paint around a rotating platform).

Wang believes that an exhibit such as this appeals not only to science majors but to art majors as well.

"It is very interdisciplinary," Wang said. "It is a project that involves both mechanical and electronic engineering."

Keeping with the theme of bridging between graphic arts and physics, Wang asked Ricardo Miranda, assistant professor art, to help critique the demonstrations.

Some of the robots were able to move freely in order to create overlapping circles with tangent lines. Others involved elaborate pulley and lever systems that moved markers in pre-determined patterns. One machine used marbles covered in paint to create a sporadic, randomized design.

"Engineering students and art students alike can take the course," Wang said. "Though a background in circuits is a requisite."

The course is new to the campus, having been introduced by Wang, but it has already met with enthusiastic support from members of both the scientific and artistic campus communities.

"The School of Engineering is very small," Wang said. "It needs more exposure."

Robots have already taken over assembly lines and dangerous tasks that humans could never accomplish. However, one cannot forget to put things into perspective.

For instance, in the 1960s television show "Lost in Space," the robot is known for saying, "Danger Will Robinson!"

Nowadays, though, Will Robinson has nothing to worry about; Thomas Kinkade, however, may just want to consider sleeping with one eye open.