>> by Samuel Coniglio

Every year I go to RoboGames (**www.robogames.net**), I am impressed with the quality and diversity of the robot events and even more impressed by the people who participate. This is the largest event of its kind on the west coast. Located in San Francisco, CA, this is the perfect place for engineering talent and artistic creativity to merge.

Under the shadow of the Golden Gate bridge, jutting out into the beautiful San Francisco Bay, the warehouse piers of the former Fort Mason Army base were converted years ago to host events (**www.fortmason.org**). For the last five years, the eastern-most pier has been transformed into a robo-mecca, a celebration of all that is robot.

This year's RoboGames introduced the brand new COMBOTS arena. Designed like a polycarbonate glass house, this new battle arena has a truss-

>> COMBOTS arena.

<< 2008 RoboGames group shot.

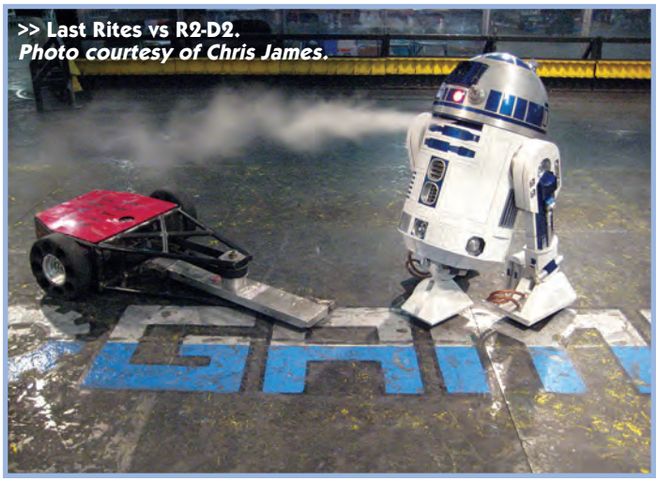
reinforced roof to avoid sagging, a ventilation system to remove nasty fumes, and some metal I-beam bumpers with teeth! The hinged bumpers at the entrances require an air compressor to lift and open the 100 pound doorways. As promised, double one inch polycarbonate sheets ring the lower half of the arena for extra protection. This house of pain will take on lots of flying shrapnel over the next few years. Also notable is the power of a noisy robot. When Curt Meyers cranks up the lawnmower engine on the "Jaws of Death" — a 340 pound class crab-like behemoth — kids from all over the cavernous Ft. Mason Festival Pavillion stop what they are doing and run to the COMBOT arena. Even from inside the arena, the sound of "Jaws of Death" excites and thrills the entire crowd.

A confluence of energies power this event: close proximity to the technical prowess of Silicon Valley, a truly international participation, frank and open collaboration between builders, and energetic volunteer support of the local community ... especially from the radical Burning Man art scene (**www.burningman.com**). Where else would you see T-shirt wearing geeks mingle with the leather and fur clad burners? It ends up that a lot of burners are closet geeks, and more than a few of them bring their bots to the show.

Case in point: the Orb Swarm (**http://orbswarm.com**). Three beautiful spheres, each about three feet in diameter, rolled around the games in a seemingly random manner, thrilling children and adults. In reality, the bots — created by Michael Prados and a team of robo-burners — are very sophisticated, as well as beautiful moving works of art. Looking through the metal weave pattern of the sphere, you can see a heavy battery pack acting as a reactive ballast. A drive motor spins the shell against the ballast, causing the orb to roll. A steering motor tilts the ballast, allowing the orb to steer. The brains are a 200 MIPS Linux ARM processor with GPS and MEMS accelerometers and yaw rate gyros for navigation and steering. Multi-color LED lights appear to flicker as the orb rolls. Over a dozen random sounds play from speakers attached to the top of the motor. At RoboGames, the swarm was

>> Jaws of Death.

>> Baby and mom watching the Orb Swarm.



>> Last Rites vs R2-D2.
Photo courtesy of Chris James.

>> A family stopping to watch R2-D2.


>> Bioloid humanoid.

>> Children playing with the OLLO robots.

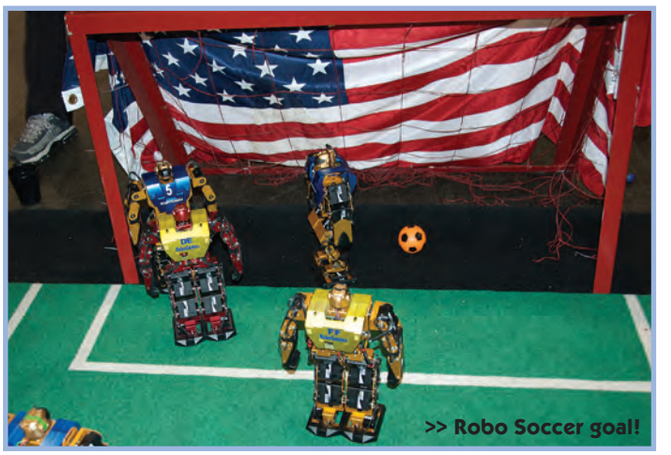
quietly run by Bluetooth enhanced game controllers, but I was told the goal is to make them run autonomously during this year's Burning Man Festival, in Black Rock City, NV.

In Japan, bot builders are inspired by Astro Boy; in the US, kids are inspired by R2-D2. It was fun to see not one but two artoo units roving around RoboGames. Built by Chris James (**www.artoo-detoo.net/**) and Gerard Fajardo (**www.astromech.net/**). They put some serious effort into making the most accurate work on the droids, and the results are beautiful. Complete with sound effects (and a mister?!?), these droids look like they came out of the Lucasfilm warehouse in Marin county, just a few miles away. This is a pure hobby, and Chris just cannot make a cent when he does shows and demonstrations. Although I missed the Friday events, I heard there was a confrontation between Artoo and a couple of combat robots in the COMBOTS arena. Fortunately, the droid escaped unscathed.

A new vendor at RoboGames, Robotis, was showcasing not only its Bioloid humanoid robot, but also the new OLLO robots for children. An entire OLLO carnival was on display. These tiny bots are made of bright plastic blocks — not unlike LEGO — and use a new micro-actuator called the Dynamixel BX-2. One green-carpeted section was turned into a playground for kids and adults building the OLLO family of bugs and critters.

Outside, the Robo-Magellan teams were getting better at making bots that can find their way around. Using a combination of GPS receivers and sonar, the bots use autonomous navigation and obstacle avoidance over the varied, outdoor terrain of Ft. Mason Park. Robots have three opportunities to navigate from a starting point to an ending point and are scored on time required to complete the course with opportunities to lower the score based on contacting intermediate points. Returning from last year,


>> Team USA playing Robo Soccer.


>> Robo Soccer goal!

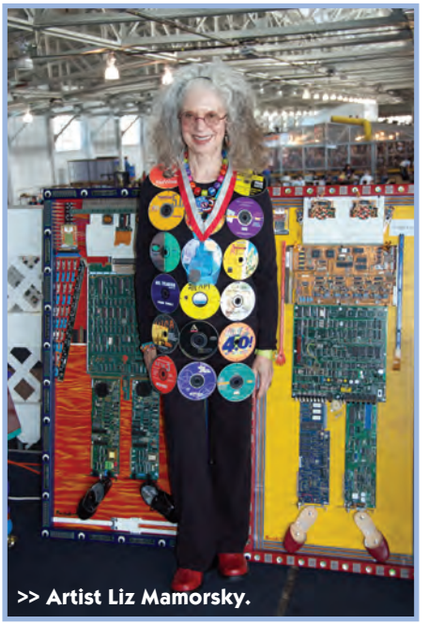
For complete RoboGame results/winners, go to **www.servomagazine.com** and click on the Table of Contents for October to find the link.

the Intrepid made quick work of getting to its destination. Rival team Zippy also did surprisingly well and shared the gold medal. There was a strange incident when one of the bots suddenly veered off course and chased after an unsuspecting dog. After much barking and jumping around, the dog seemed to scare off the bot as it resumed on its way.

Robo Soccer was back this year with a large number of Robo-One entries. Contestants came from South Korea, Taiwan, Russia, the UK, Japan, India, Austria, and the US. One notable match was between the US and Austria. The HiTec team, led by RoboGames founder David Calkins, fought hard to hold off advances from the Austrian team. Much of the time was spent picking up fallen robots. (Why do they insist on using astroturf?) A last minute maneuver, and suddenly the orange ball was kicked into the US goal.

Up in the mezzanine area overlooking the games are the art bot displays. Art bots add a unique quality to RoboGames. Creativity and fun added to an otherwise dry technology boost the possibilities of new ideas. Plus, they look cool. For artist Liz Mamorsky, this was her first robot event. Using circuit boards as her canvas, she creates little bot people. In the kinetic arts category, Marko Galt's "Mechanical Woman Walking" is a beautifully crafted brass sculpture that uses a counter weight to tighten a spring that causes the arms and legs to "run" in mid air.

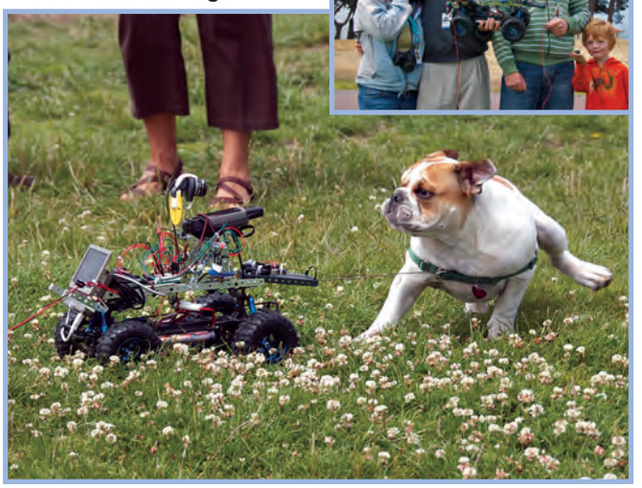
A powerful aspect of the RoboGames event is its all-volunteer crew. These dedicated people — some of whom also participate with their own bots — help make these games a powerful and cohesive force. Five years is a long time to keep the same group together, and they do it for the love of the robot. **SV**


>> Artist Liz Mamorsky.


>> Mechanical Woman Walking.

>> Red Dwarf team.

>> Red Dwarf vs. Dog.




>> Titanium sparks.


>> Texas Heat.