

RoboGames 2007

by Pete Smith

The Guinness Book of World Records list "RoboGames" as the World's largest open robot competition. I don't know if that is true, but it's certainly the largest and most diverse that I have ever attended.

This year's event was held June 13th through the 17th in San Francisco, CA. The venue was the Festival Pavilion at Fort Mason, a beautifully restored former United States Army facility, right on the shore of the bay opposite Alcatraz island. Some of a former inmates friends are still around!). The piers and large buildings which had seen major activity during the Second World and the Korean Wars would now house a much more benign but still fiercely competitive contest.

Fort Mason is a brisk walk (or short drive!) from the hotels and restaurants of Lombard Street so it is possible to stay nearby and avoid the slow traffic in San Francisco's narrow streets. If you got to the venue early, there was no problem in parking and it is also well served by public transport.

RoboGames covers just about the whole gamut of Robotic competition, from Art Robots, through autonomous "fire fighting" and soccer bots right up to huge 340 lb combat robots fighting it out in a steel and polycarbonate arena. Full details of all the classes and future events can be found at www.robogames.net.

Wednesday and Thursday were principally set up days. The large arena for the combat robots was being assembled (Figure 1), the various sized soccer pitches laid out, and the competitors going through safety inspections and testing their robots (and as usual, some still building).

Teams had traveled from all over the world, with strong contingents

from Brazil, China, Taiwan, Japan, Australia, Singapore, and the United Kingdom, plus smaller numbers from many other countries. The scene of the combat pits on Thursday afternoon (Figure 2) was typical of the activity in all areas of the Pavilion.

The competitions really got going on Friday. The big crowd pleaser was — as usual — the combat robots but there was plenty of interest in all the different displays and contests.

The small combat bots (up to Beetleweights) were fought in a small (a bit too small perhaps?) separate arena, while the Hobbyweights (12 lbs) all the way up to the Super Heavyweights (340 lbs) were in the big arena (next year, they will have an even bigger and better one!). Highlights included Super Heavyweight "The Judge" hitting the ceiling during a memorable fight against the Uber-Flipper "Ziggy," Heavyweight Spinner "MegaByte" reducing "The Red Baron" to splinters (Figure 3) during a rumble, and Middleweight "Sub Zero" throwing the big spinner "Mortician" to the roof and disemboweling it at the same time.

There was an almost endless series of excellent fights with most of the world's top bots meeting each other in titanic clashes. Large crowds filled the bleachers and overflowed onto every available vantage point, especially when the big spinners were in the arena.

The Brazilian Team RioBotz (www.riobotz.com.br; Figure 4) did particularly well, taking two first places. Their enthusiasm and spirit — win or lose —

was outstanding. The sport is rapidly growing in Brazil and if their current bots are anything to go by, they will be the team to beat next year.

The 12-lber "Surgical Strike" (Figure 5), that was featured in the "Going Brushless" article in the July issue of *SERVO*, won first place in its class. The new motor was a big improvement and most its matches ended in knockouts.

The Federation of International Robosoccer Association (FIRA) (www.fira.net) held its 12th FIRA RoboWorld Cup at RoboGames. There are seven different classes but the ones that really caught my eye were the MIROsot 11:11 and the similar 5:5.

There are 11 small robots (the size of a 3" cube) on each side and they play fully autonomous games of soccer. Each bot has a unique color pattern on its topside and an overhead video camera is used to determine the position and orientation of each bot. Each team uses high powered computers to scan the image, and control — via a RC link — its bots in order to score goals (Figure 6). It's amazing how well this all works. The bots show remarkable agility, speed, and precision, and make a fine demonstration of optical recognition, computer power, and high speed RC links.

Robosoccer is dominated at present by teams from Singapore, Korea, Taiwan, and China with the sole exception of the KheperaSot class of fully autonomous bots, where teams from Germany took the first three places.

The results for this and other classes that competed at RoboGames can be found online at <http://robo>



FIGURE 1



FIGURE 5



FIGURE 2

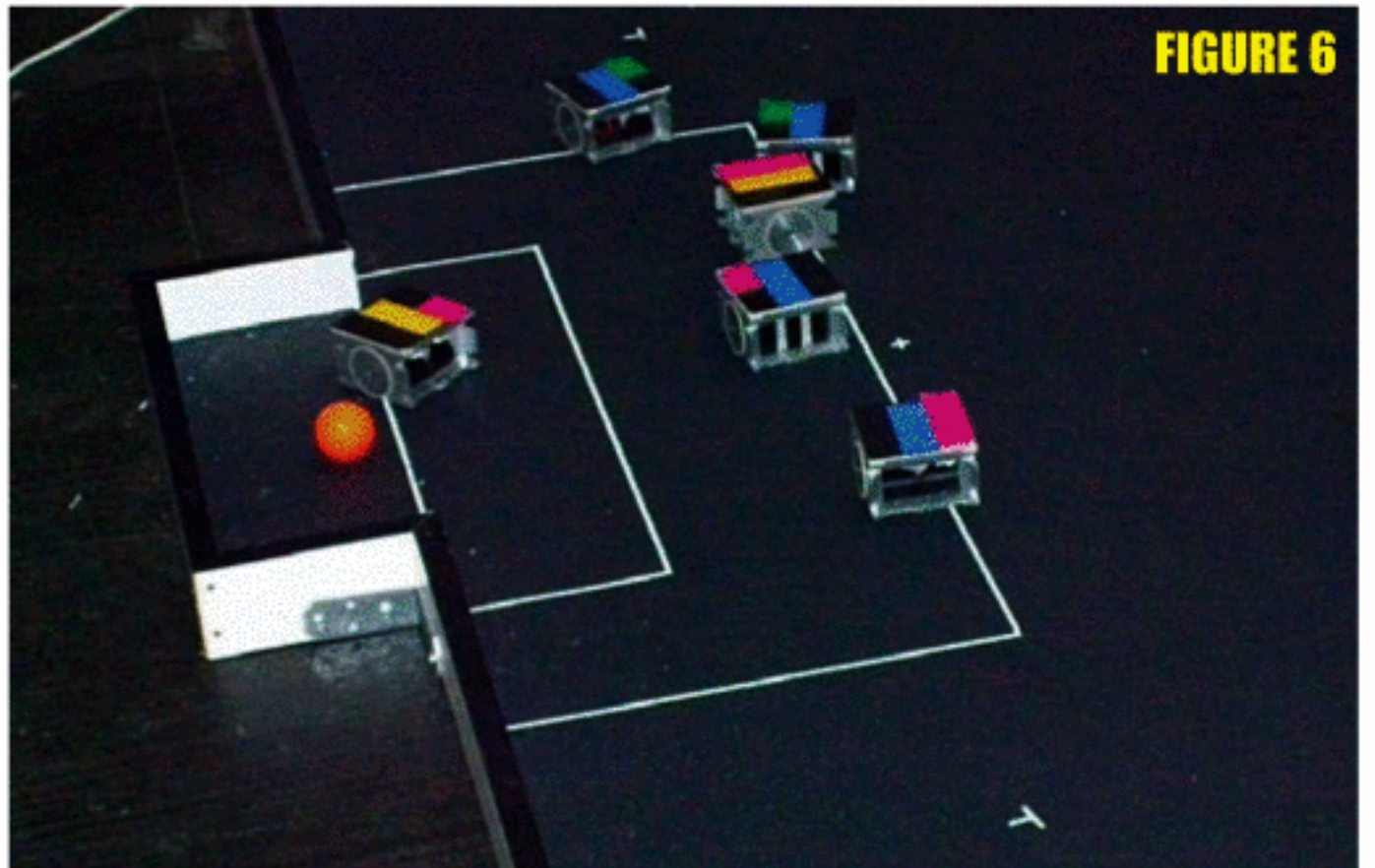


FIGURE 6



FIGURE 3

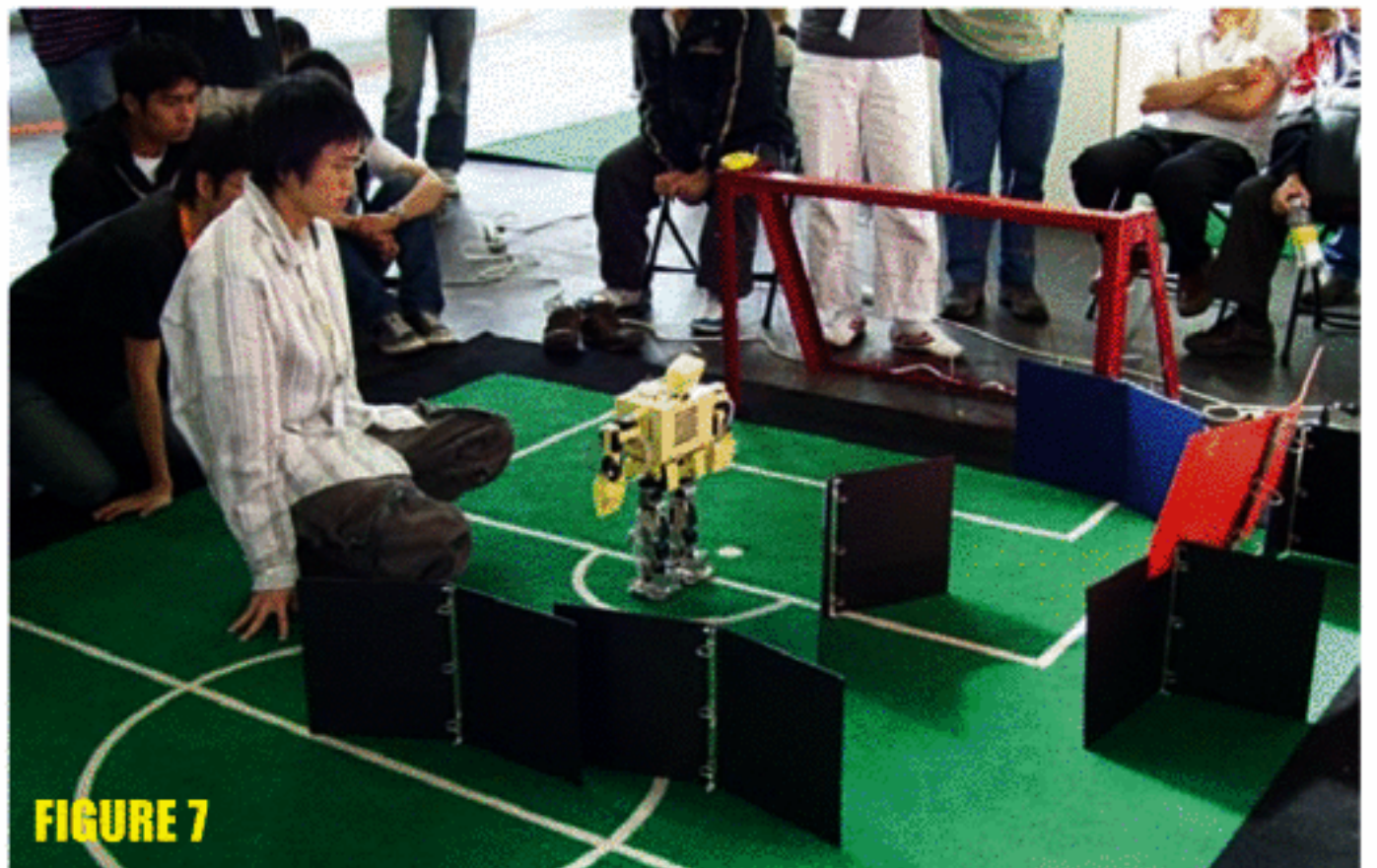


FIGURE 7



FIGURE 4

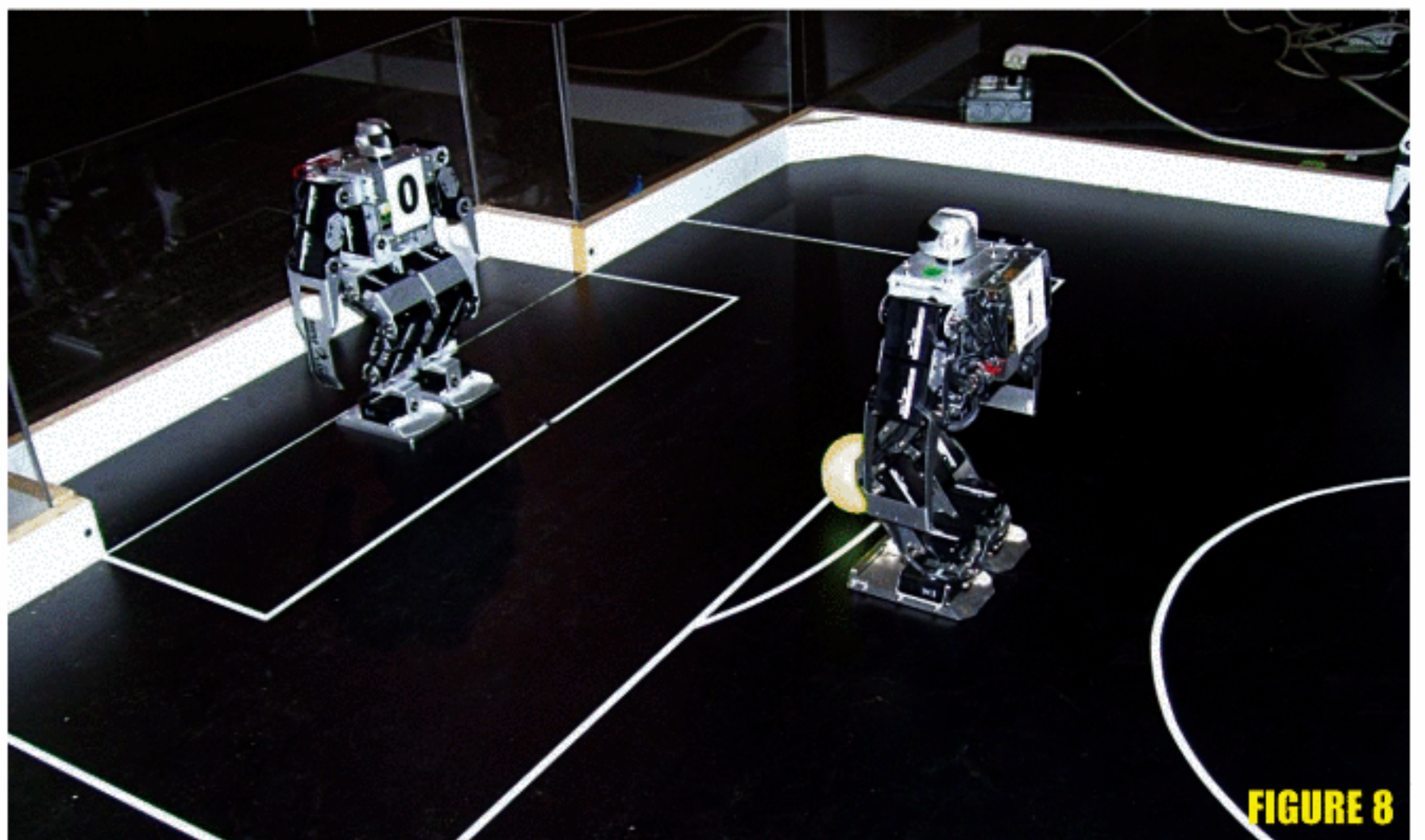


FIGURE 8

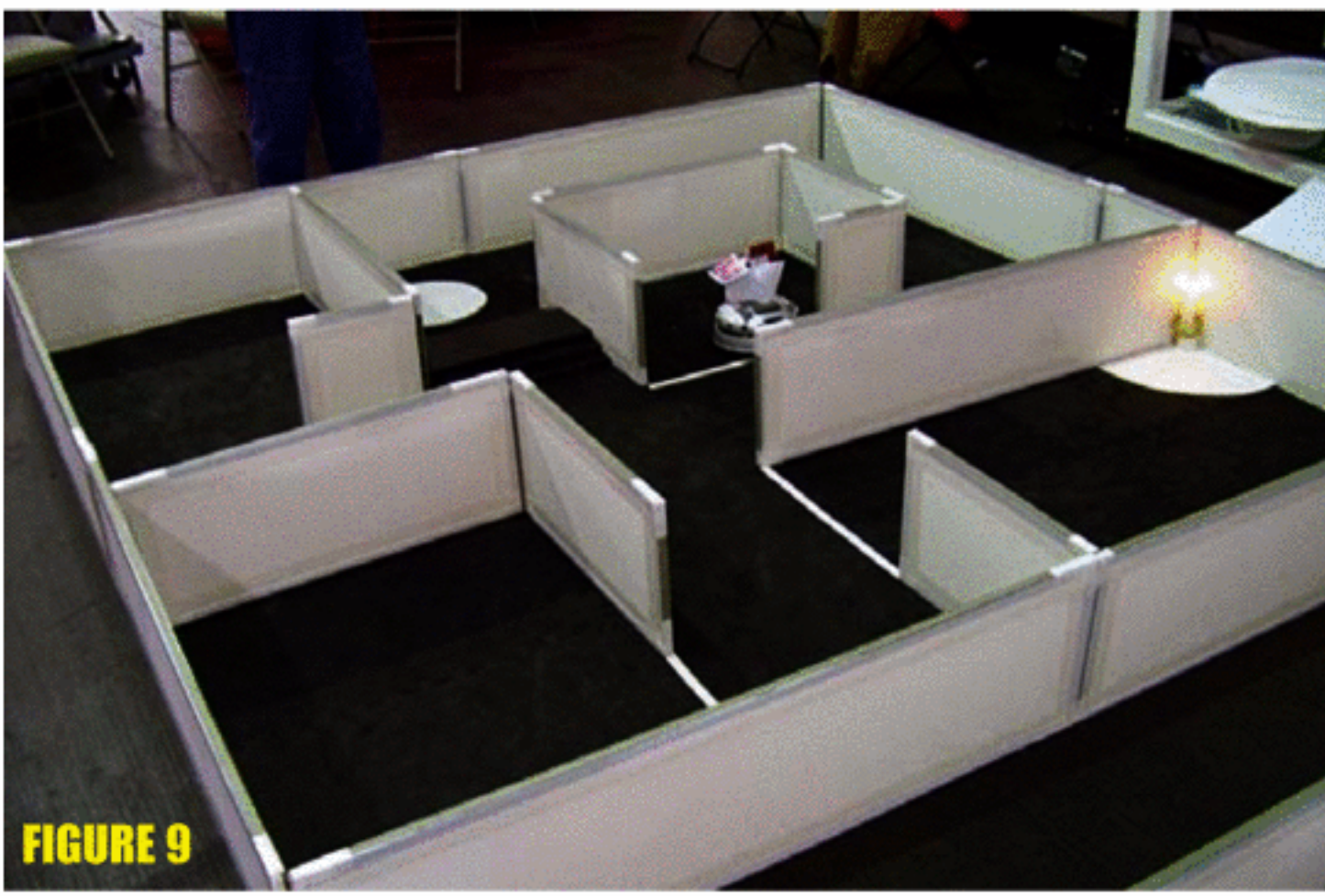


FIGURE 9

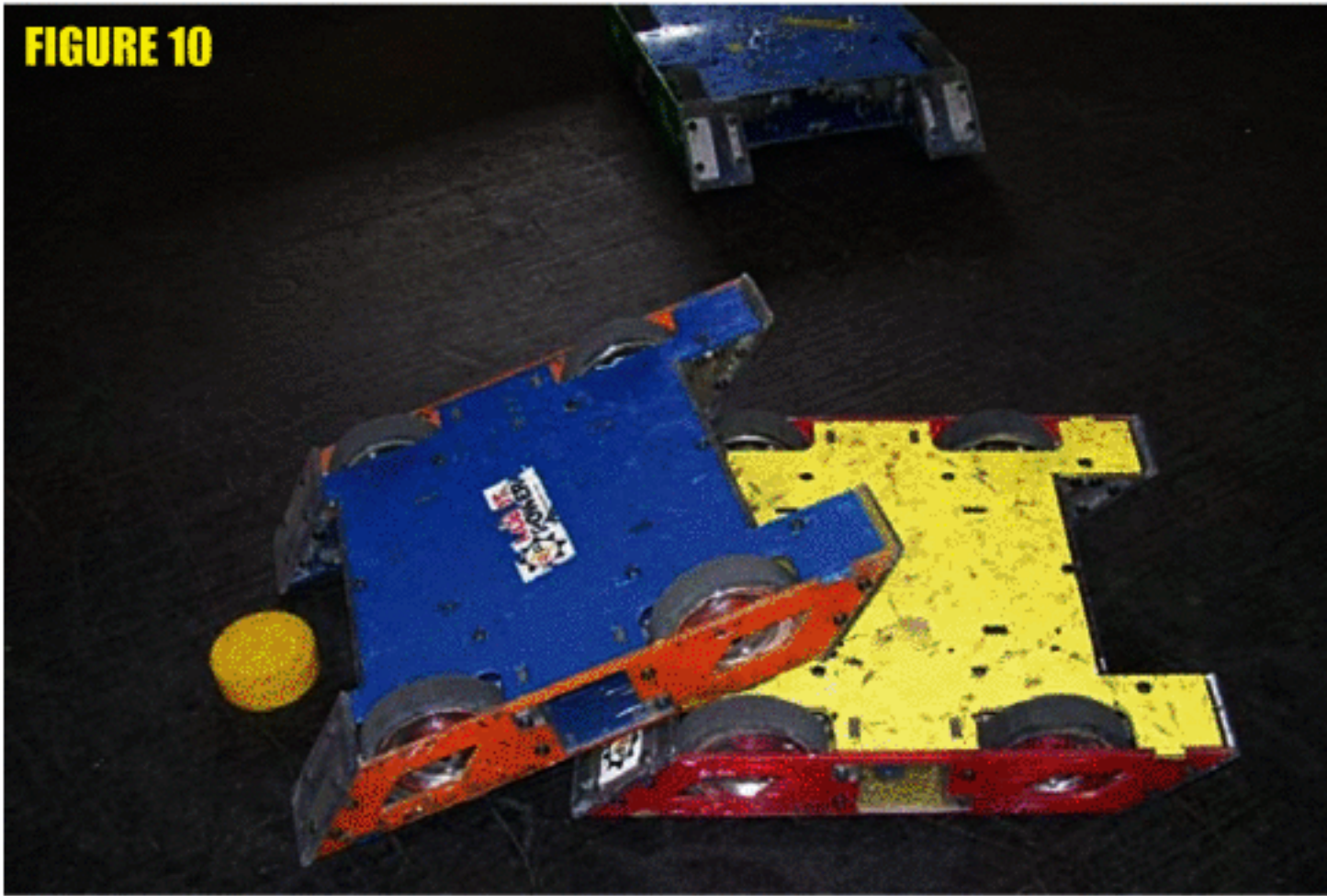


FIGURE 10

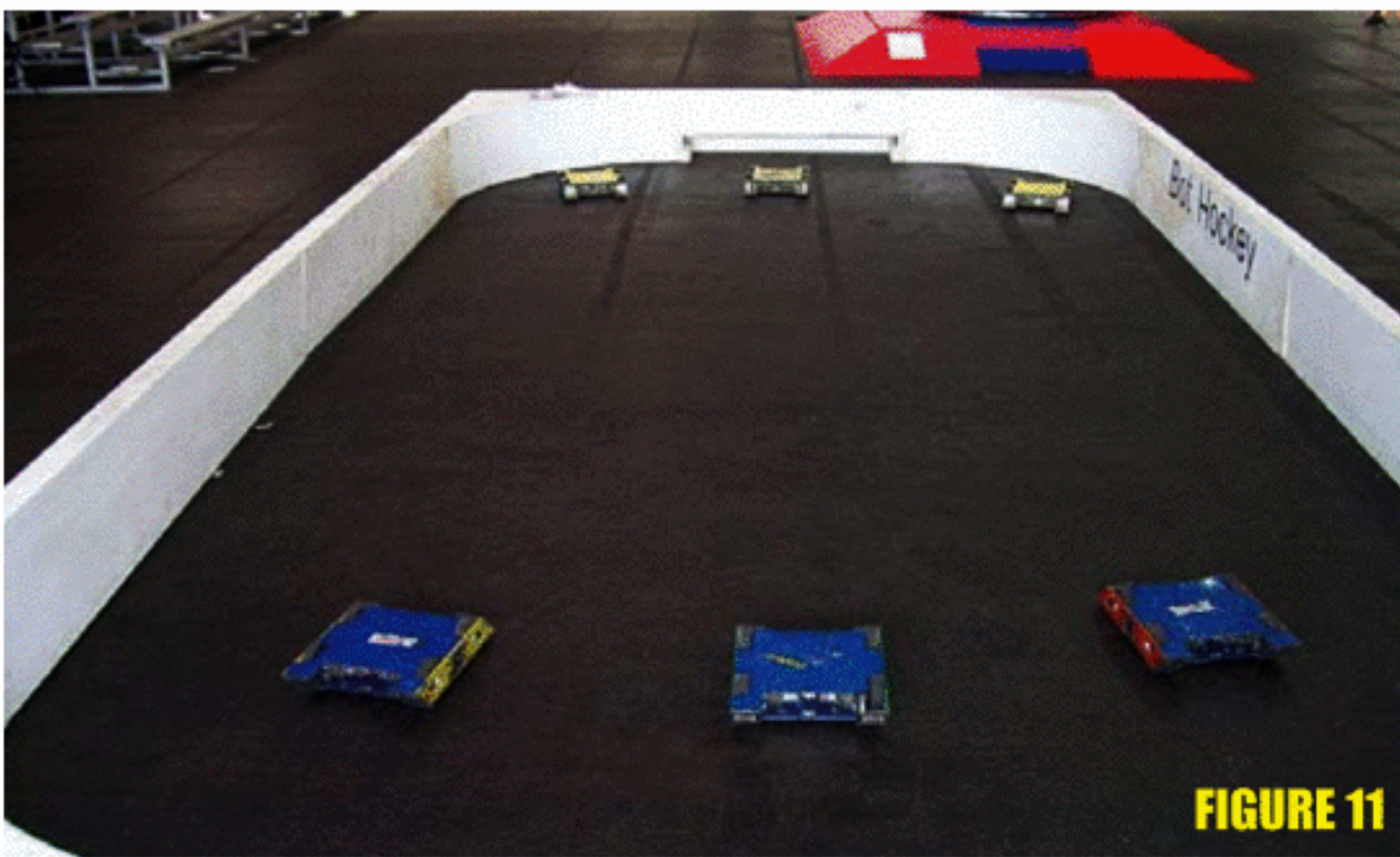


FIGURE 11



FIGURE 13

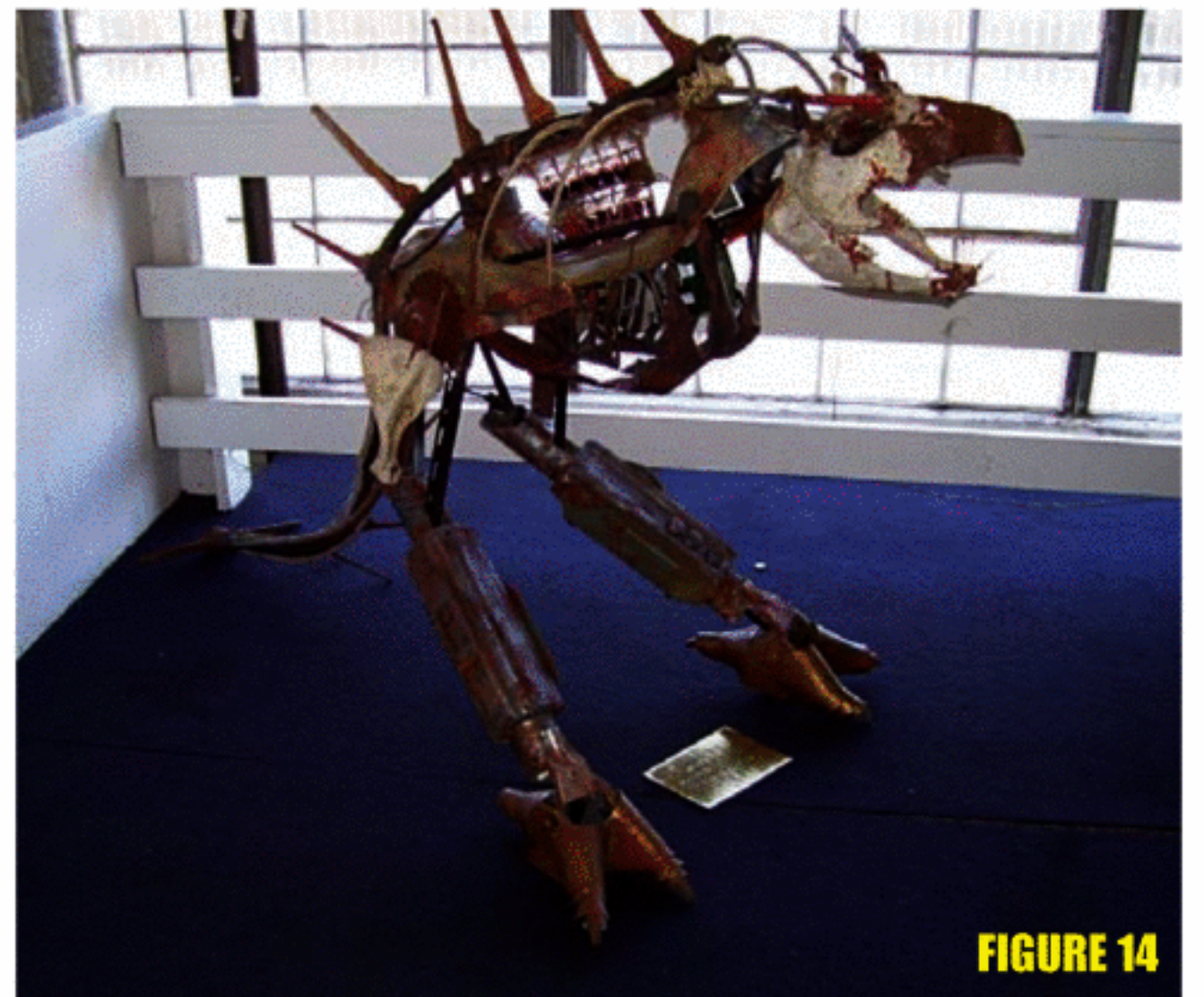


FIGURE 14



FIGURE 12

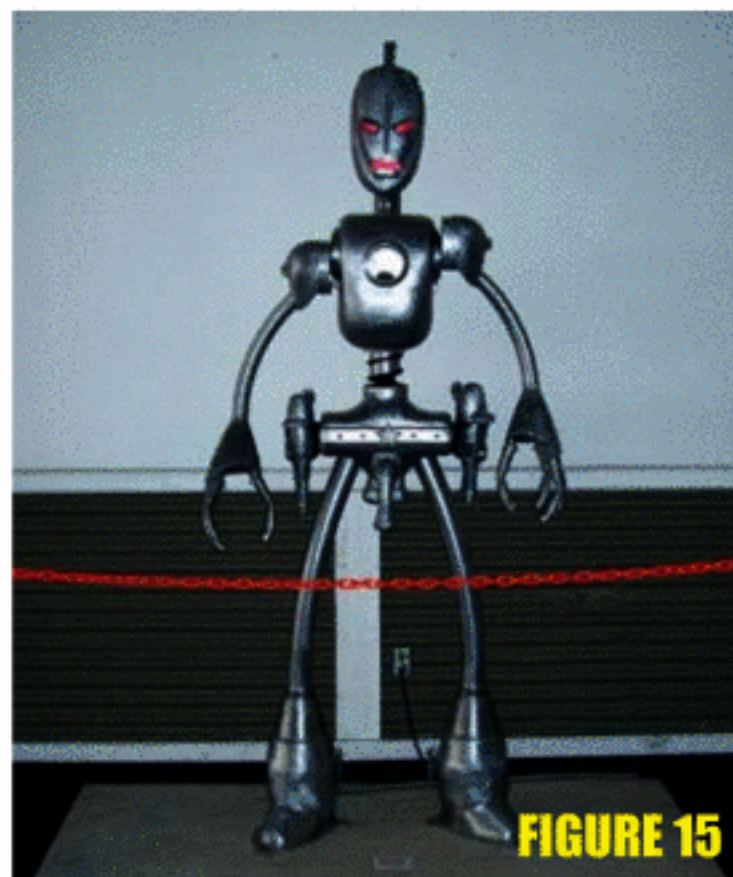


FIGURE 15

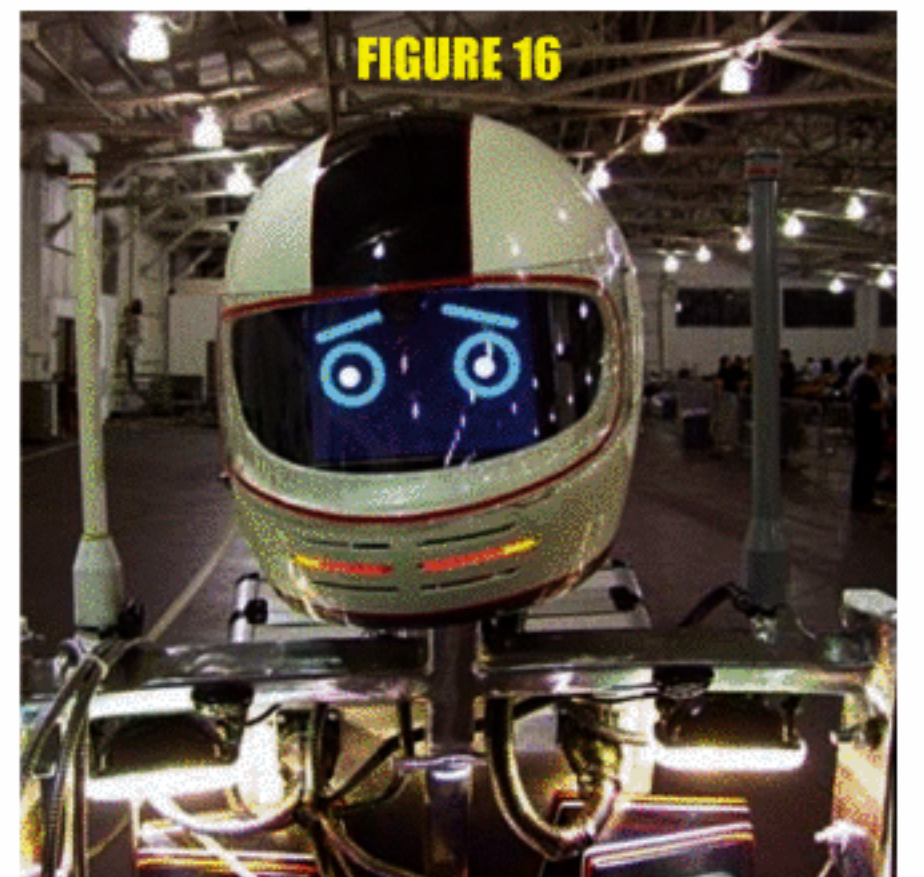


FIGURE 16

games.net/2007.php.

Humanoid and Robo-One/Android bots took part in many different competitions. Some of these bots were fully autonomous while others were under radio control. An example of an autonomous challenge was the "Humanoid Obstacle run" where a walking robot has to navigate its way through a number of obstacles (Figure 7). This appeared to be a pretty tough task with most having great difficulty in completing it.

The bots in the "Penalty Kick" (Figure 8) and "Kung Fu" are partially radio controlled and were much more agile. The mechanicals of these type of

robots is Bot Hockey (www.bothockey.com). In this sport, two teams of three radio controlled bots (Figure 10) battle it out to score goals in a simple arena (Figure 11). The games end up very much like their NHL counterparts with a lot of pushing and shoving and an occasional violent slamming of the opponents into the walls. The games quickly drew crowds, who soon got caught up in the fast paced action.

Former "Battlebots" heavyweight Champion, Carlo Bertocchini, demonstrated a couple of his new "RoBoxers" (www.roboxers.com). These are 3/4 life-size Humanoid figures carried on a radio controlled wheeled platform

15). Bar tender robots were in action up on the mezzanine as was a robotic drum set (my son who takes percussion at school says it was pretty good) and an eclectic collection of mechanisms and displays with a robotic theme.

On the Pavilion floor, you could meet R2D2, an Imperial Stormtrooper, and a very cool robot called "Hotshot" (Figure 16) who went around talking to people. There must have been a person operating it, but I never spotted him/her.

I haven't covered all the robots and contests at the show as it would take more than one visit to cover everything, especially if you are

RESULTS FOR THE COMBAT ROBOTS:

• **340 lbs**

• **220 lbs**

• **120 lbs**

• **60 lbs**

• **30 lbs**

• **12 lbs**

• **3 lbs**

• **1 lb**

• **1 lb (Auto)**

• **5.3 oz**

Canada — Ziggy

USA — Sewer Snake

Brazil — Touro

Brazil — Touro Light

USA — Totally Offensive

USA — Surgical Strike

USA — Dark Pummeler

USA — Dark Pounder

USA — Thinkling

USA — Micro Drive

USA — The Judge

USA — Last Rites

USA — Pipe Wench

USA — K2

USA — Proteus

USA — AlphaQ jr.

USA — Itsa?

USA — Dark Blade

UK — Spider

USA — Dark Bullit

USA — Vladiator

USA — Original Sin

USA — SubZero

Canada — Texas HEAT

USA — Whammo

USA — Bullet

USA — Gutter Monkey

USA — Revert

UK — Chopper

Mexico — Skeet Skeet

robots are advancing rapidly, but the sensors and on-board processing power have a way to go to catch up.

The fire fighting robots were also fun to watch (www.trincoll.edu/events/robot/). The robot starts out in a random location in a house-like maze (Figure 9) and then has to find and blow out a candle that is randomly positioned in another room. Extra points can be gained for speed and if further challenges like stairs are inserted. Likewise, points are lost if the bot touches a wall. The bots are fully autonomous and use multiple sensors and have a lot more space for the high speed processors than their bipedal counterparts.

A new offshoot from the combat

(Figure 12). They can bend at the waist and throw punches with either arm. Sensors mounted on the robot's body and head record hits and the bot that gets the most hits wins the round. James Hyneman of the TV show *Mythbusters* (seen here with Carlo, Figure 13) controlled one of the bots in a fight in the arena.

Audience reception was mixed as it was difficult to tell when a hit was scored, but the idea definitely has potential.

There were other attractions at the show including a number of "Art" bots which featured a pretty scary looking metal dinosaur (Figure 14), a giant squid, and a well equipped (if somewhat under-dressed) robot gunslinger! (Figure

competing as well. The good things were a broad range of robot types, surely enough to cover all interests! A great venue, lovely weather (mid 70s-80s) and — for me — the biggest, best, combat show in the USA.

Bad things? Well, the catering was poor (luckily, there is a supermarket just outside Fort Mason that did reasonable carry out food); there was a lack of information posted as to what was going to happen when and where; and finally, a badly handled (in my opinion), last minute, change of rules caused quite a bit of ill feeling with some of the combat builders.

Overall, a great event and one that with a little attention to detail will be near perfect! **SV**