

Robot wars: Giant robot gears up to battle Japanese rival

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The hulking, 15-foot-tall robot rests on its tank treads in a West Oakland warehouse, waiting for the coming war against its powerful nemesis across the sea.

It looks fearsome. One arm is a missile launcher and the other a cannon. Some of that is bluster: It lumbers around at 2 mph, powered by a lawn mower engine.

But its inventors, Gui Cavalcanti and Matt Oehrlein, have already signed it up for a historic duel. To win they will need to spend the next year transforming their creation into a more nimble fighting machine.

This is not exactly the promised future of robotics, which is increasingly being applied to help humans with manufacturing, health care, humanitarian aid and getting around. But Cavalcanti and Oehrlein, 29-year-old co-founders of Berkeley-based MegaBots Inc., are hoping to fulfill another human desire: ferocious, gladiator-style entertainment.

"There's an entire group of gamers who've been waiting for this their entire lives," Cavalcanti said after climbing down from the contraption's cockpit inside the American Steel Studios in Oakland. "People like combat, and people really like high technology. This is a perfect blend. We want to make an entertainment spectacle."

The engineering duo and their third co-founder, Brinkley Warren, released a video recently calling for help to give their machine an

overhaul so it can defeat a rival built four years ago by Japanese firm Suidobashi Heavy Industry. The location and timing of the battle is still to be determined.

MegaBots initiated the challenge, and Suidobashi accepted last month, but the American startup and its paintball-shooting machine are not quite ready for the speed and crushing hand-to-hand combat skills of the Japanese model, Kuratas, which sits on a wheeled tripod and carries a high-powered Gatling gun.

So the MegaBots team announced a Kickstarter campaign, earning more than half of its \$500,000 goal in the first 48 hours.

It took about 3{ months and \$200,000 in hardware to assemble the current version of the machine, known as Mk II, which they showed off at the Maker Faire in San Mateo in May. The machine is what's called a "mech" and was inspired by the MechWarrior video games its inventors played when they were kids. It needs a gunner and a human pilot, who shifts the [robot](#) to slouching mode for high-speed driving and moves it upright for battle.

"Right now, it has more in common with a vehicle than a robot," Cavalcanti said. "The lower half is almost entirely manual. But the final version of the robot will be much more autonomous."

A partnership with San Rafael-based Autodesk, which makes engineering and construction software, inspired the co-founders to move MegaBots to the Bay Area this spring from Somerville, Massachusetts. They found the co-working studio in West Oakland, a hub for large-scale mechanical artistry, and also used Autodesk's waterfront facility in San Francisco to weld the weaponry.

"It's hard to build really big robots in Boston," Oehrlein said. "It's a

pretty old city, the real estate is expensive and you just can't find big warehouses with cranes. Those facilities exist in the East Bay pretty abundantly."

The team also wanted an abundant supply of tech talent as the company scales up and expands.

Their Kickstarter campaign is to raise money for improvements, including "shock-mounted steel armor we need to survive multi-ton punches" and "hydraulic actuators to handle the additional weight of our armor and weapons."

"Our robot is sort of built for range combat," Oehrlein said. "It can't really take a punch or swing a punch."

They also need five times the horsepower to handle a more sophisticated hydraulic system. They have found partners, including NASA, which has technology that can make the cockpit safer, and extreme vehicle fabricator Howe & Howe Technologies, which is helping design a faster-moving track base.

Cavalcanti and Oehrlein dropped out of their promising careers at big-name robotics companies to make their dream creations. Cavalcanti worked for Google-owned Boston Dynamics, which just recently awed and frightened YouTube viewers with a new video showing its humanoid robot walking through the woods. Oehrlein worked for the Detroit research lab of Eaton Corp., helping to design high-end hydraulics for military construction and transport vehicles.

"We both worked on really high-end technology that never saw the light of day," Oehrlein said. "Giant fighting robots is way more public."

Cavalcanti's expertise is in mechanical engineering, and Oehrlein in

control systems and electronics. Warren handles business development and finding a place for the firm in the entertainment industry.

They are already envisioning a global network of arenas devoted to their new battle sport, a kind of international robot Olympics that is part Ultimate Fighting Championship (the mixed martial arts competition) and part Formula 1 racing. Each country will arm its own robot army. But don't worry, say Oehrlein and Cavalcanti, it will always remain pure sport.

If robots one day wage war on Earth, they will more likely be advanced versions of today's killer drones, not lumbering humanoid machines.

"Ours is a bigger target than a tank, slower than a tank, and it can fall over," Cavalcanti said. For a real military, it's "the worst possible design."

But for a gladiator fight, watch out, Kuratas.

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