



THINGS FALL APART

A seemingly simple, sturdy, wood-veneer chair has become an online video hit. With its "brain" in its seat, the chair collapses into a disheveled, disconnected heap; its legs then slowly find each corner of the base, connect back together, and eventually, the chair stands upright.

The next breakthrough in artificial intelligence?

Not quite, says the chair's system architect, Raffaello D'Andrea, Cornell associate professor of mechanical and aerospace engineering.

"It has no utilitarian value," D'Andrea said. "It is an art piece."

The artistic brainchild of Canadian artist Max Dean, the chair is currently on tour at art exhibits around the world, most recently at the Ars Electronica show in Austria.

Better known around Cornell as the faculty adviser to the world champion student RoboCup team, D'Andrea partnered with Dean two years ago as chief engineer for the Robotic Chair project, which also included Matt Donovan—another Canadian artist—and D'Andrea's former student Steve Lowe.

The creation of the chair would have been artistic achievement enough, but the robot's rapid rise to fame over the Internet has created an unexpected buzz. A recent spot that aired on the Discovery Channel also helped surge the chair into the international spotlight.

The hype began, D'Andrea said, right after he spoke about the chair at a Cornell-sponsored event in Silicon Valley in May. He and the rest of the chair team had just finished building a working prototype.

"Word just got out, and somebody decided to put the

video on YouTube," said D'Andrea, who is currently on a year's leave from Cornell, working on a startup company he helped found that employs robotic technology.

The Internet home video hub YouTube has received more than 180,000 download requests for the video of the Robotic Chair, and varying user comments.

"It's cool, however it doesn't really have a point :P," one viewer wrote. "Are you Kidding Me? Yes it does have a point! They can use this technology to make robots that can be regenerative if destroyed," another viewer replied.

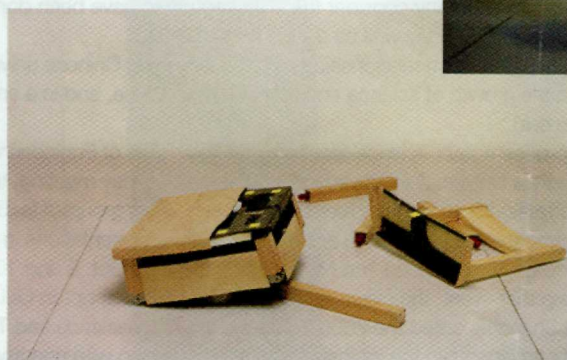
"The Robotic Chair" isn't the first engineering/art collaboration D'Andrea has worked on with Dean. In 2001, a nondescript robotic table that followed people around was the focus of the pair's artistic sensibilities. The table was exhibited at the Venice Biennale and later purchased by the National Gallery of Canada.

As system architect for the chair, D'Andrea figured out how the robot, which involves 14 motors, two gearboxes, and many other parts, would accomplish the task of autonomous self-as-

sembly. Donovan and Lowe built the robot, while D'Andrea outlined the engineering specifications and wrote the algorithms that bring the chair to life. The robot uses a sophisticated algorithm to know how to find its component pieces and build itself back up. It communicates with a computer, which sends commands to the chair's "brain" in the seat so it knows which pieces it needs next.

"Some people thought it was a hoax, or fabricated, or computer animation," D'Andrea said. "Others thought it was remote-controlled. The reality of it is, it's not. It's a self-contained system that does what it does."

—Anne Ju, *Cornell Chronicle Publications*



Photos provided by Raffaello D'Andrea



"The Robotic Chair" falls apart and reassembles itself autonomously. <http://www.mae.cornell.edu/rafi/InteractiveDynamicArt/InteractiveDynamicArt.htm>