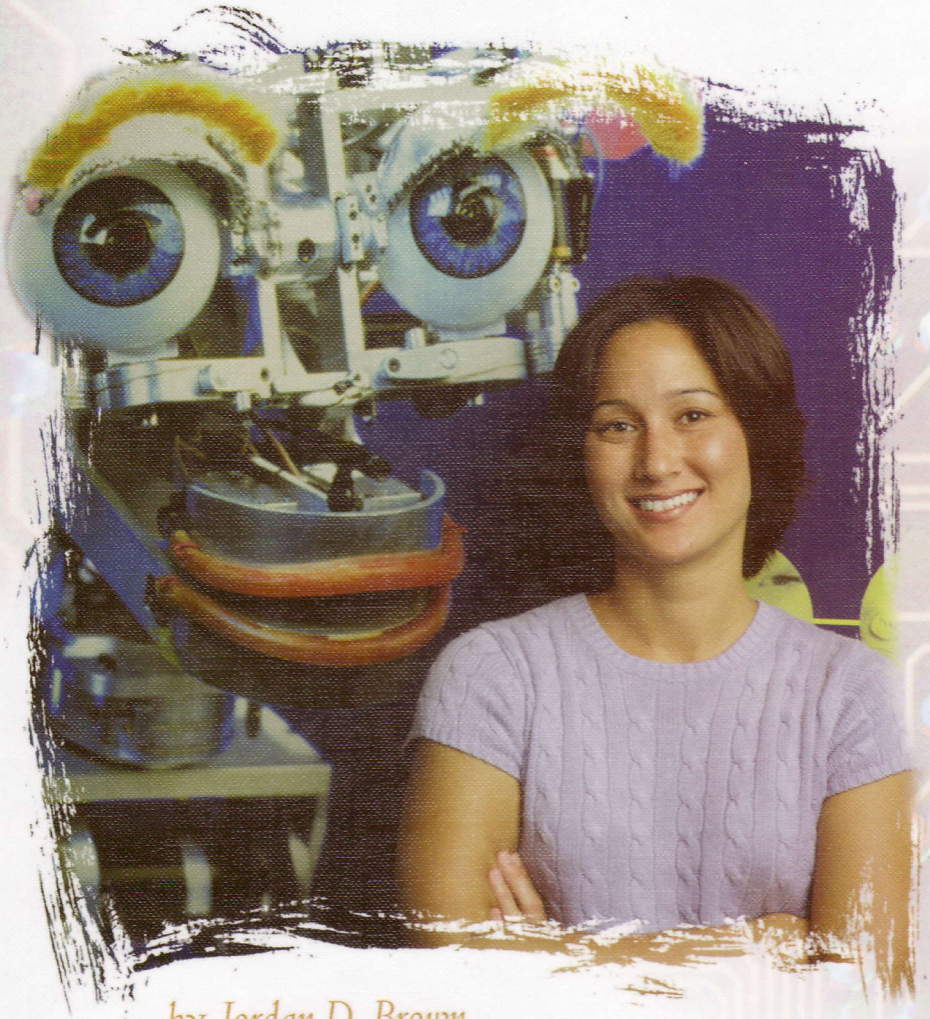
WOMEN'S ADVENTURES IN SCIENCE

ROBO WORLD

the story of robot designer CYNTHIA BREAZEAL



by Jordan D. Brown

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SCHOLASTIC

1

Visiting an Old Friend

Cynthia Breazeal shows her silly side at MIT in May 2000 *(above)*. Hours before, she had defended her thesis research about a robot named Kismet *(opposite)*.

Since April 2003, a cartoonish-looking robot named Kismet has been one of the star attractions of an exhibit entitled "Robots and Beyond: Exploring Artificial Intelligence." Most people who view this display at the Massachusetts Institute of Technology (MIT) are amazed and awed by the idea of a "lifelike" robot. They are also impressed by the videos of Kismet in action. But one visitor looks at Kismet in a very different way.

Cynthia Breazeal feels an odd mix of pride, melancholy, and nostalgia when she stops by the exhibit. Why? Kismet was one of the robots Cynthia created as a graduate student at MIT. And although she is thrilled and honored that Kismet is such an important part of the exhibit, a wistful feeling hits Cynthia when she realizes that, in many ways, Kismet is no more.

All that remains of Kismet is its head and neck. (Okay, it never actually had a body.) Kismet's brilliant "brain" is gone. That's because the 15 networked computers that once ran the robot's motors, sensors, and programs belong to MIT's Computer Science and Artificial Intelligence Lab (CSAIL). Other graduate students have commandeered these computers to run software for their own robot projects. As a result, Kismet is no longer an active robot.

The MIT Museum visitors who stare at Kismet's motionless face might wonder why the *Guinness Book of World Records* named it the "World's Most Emotionally Responsive Robot." But Cynthia Breazeal knows why. She remembers Kismet's glory days—when those big blue eyes, fuzzy eyebrows, and red rubbery lips reacted to the sound of her voice. It was a time when her robot pal seemed almost alive.

In April 2003, schoolchildren visited the MIT Museum in honor of the addition of Kismet's head to the museum's collection.

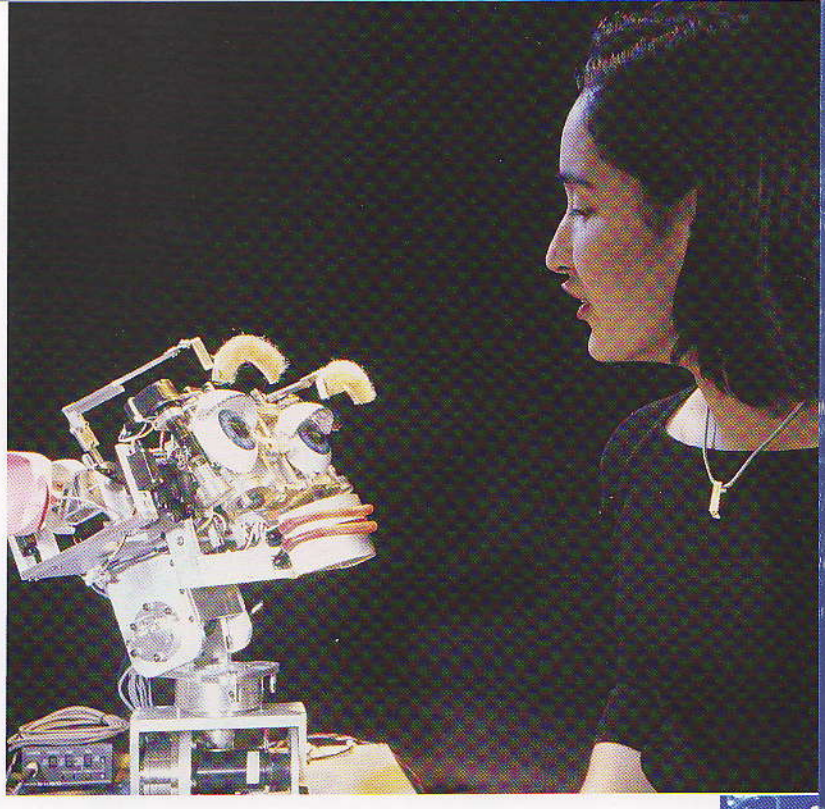
Back in 2000, when Kismet lived in Cynthia's workspace on the ninth floor of the Artificial Intelligence (AI) Lab, meeting the robot face to face was a completely different experience. Cynthia and her team spent years designing Kismet so that it could notice and respond to human social cues. If you had met Kismet then, you probably would have been astonished.

In those days, Kismet seemed to know what people were saying. For example, if you walked into the lab and casually asked, "Hey, what's up, Kiz?" the robot would crane its neck in your direction. As you moved closer, its big blue eyes would make eye contact with you and follow your movements. If you said in a sweet, singsong voice, "You are such an adorable robot!" Kismet's face would move closer and smile. But if you scolded Kismet with a stern "Bad robot!" Kismet would pull back in fear.

Of course Kismet could not actually understand English—or any other language, for that matter. Thanks to Cynthia's innovative programming, however, Kismet was able to use pitch and tone to recognize the emotional quality in peoples' voices and respond accordingly. The robot's face could express a variety of "emotions," including happiness, sadness, anger, surprise, disgust, and even exhaustion.

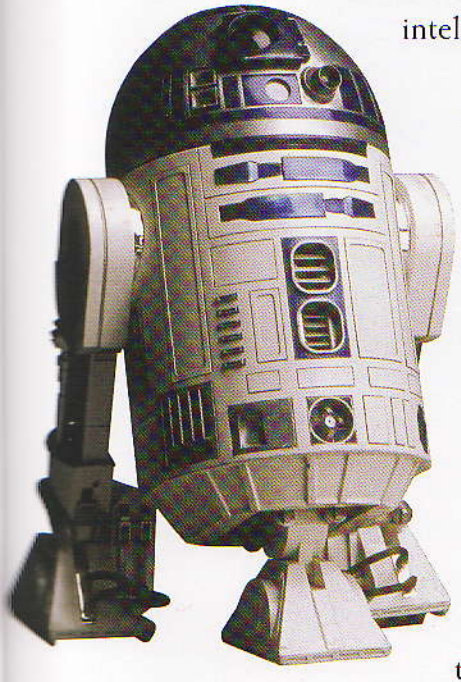
Because Kismet was so expressive, it was sometimes hard to remember that the robot couldn't actually "feel" anything the way humans and animals do. But that was a sign that Cynthia's project

was a success. Cynthia was trying to create a robot that could imitate the emotional behavior of a human infant. Her mission was to build a mechanical creature that could use its facial expressions and babbling voice to communicate with humans in a spontaneous, lifelike manner. The people who met Kismet were often astounded that Cynthia had achieved this ambitious goal. At times, the accomplishment amazed Cynthia herself. But the idea of making a robot had been simmering in her head for decades.



When Cynthia saw the original *Star Wars*, she fell in love with the human-like qualities displayed by R2-D2 *(left)*, a spunky, resourceful robot. Cynthia *(above)* chats with Kismet, as it responds to the social cues coming from her voice and movement.

Back in 1977, when Cynthia was ten years old, she watched a thrilling new movie. It was the original *Star Wars*. Like so many other kids, Cynthia was fascinated by the movie's robot heroes, R2-D2 and C-3PO. Cynthia daydreamed that one day she would create a robot as charming, engaging, and intelligent as those two 'droids.



Little did Cynthia know that her daydream would start to become reality within just a dozen years. The word "kismet" comes from the Turkish word for "fate." After seeing the lovable robots in *Star Wars*, was Cynthia destined to become a visionary robotic scientist? Who knows? But one thing is for sure: Cynthia's boundless curiosity, bold determination, and love of adventure have kept her on an exciting path of discovery from the very beginning.