

SCIENCE LIVES

Where logic meets emotion

A computer scientist gets candid about her quest to bring empathy to artificial intelligence

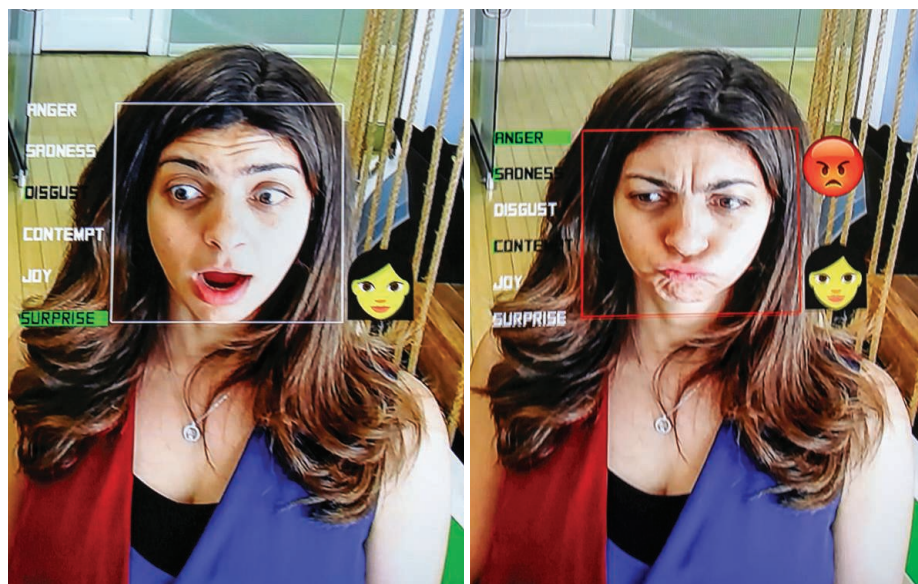
By **Vijaysree Venkatraman**

As she sat in a taxi headed to Cairo International Airport in September 2001, Rana el Kaliouby remembers thinking, “*Am I really going through with this?*” A married woman and hijab-wearing Muslim, she would be on her own for the next 3 years, pursuing her doctorate in computer science at the University of Cambridge in the United Kingdom. In *Girl Decoded*, el Kaliouby and coauthor Carol Colman have created a riveting memoir of a “nice Egyptian girl” who, despite cultural conditioning that encouraged her to put her duties as a wife and mother first, went on to pursue her profes-

sion endow machines with the ability to recognize, understand, and even express emotions. This idea ran counter to conventional wisdom, which posited that pure logic was the highest form of AI.

In her first presentation at Cambridge, el Kaliouby announced that she planned to teach computers to read facial expressions, a proxy for a person’s mental state. At the time, computers could barely tell apart a human face and a piece of fruit. The project was audacious.

A fellow student remarked that his brother, who was autistic, had great trouble understanding facial expressions. (Many people on the autism spectrum struggle to interpret nonverbal cues that indicate a person’s mood



Rana el Kaliouby demonstrates Affectiva’s facial expression recognition technology in 2018.

sional dreams. She would become a pioneer in the emerging field of artificial emotional intelligence (emotion AI), where researchers seek to build computers that can sense and respond to human emotions.

El Kaliouby was inspired by the influential 1997 book *Affective Computing* by Rosalind Picard. Drawing on findings from neuroscience, Picard’s central argument was that if we want smarter computers that interact more naturally with us, we must

or emotions.) Perhaps her work could ultimately help autistic people, he suggested.

El Kaliouby was intrigued and approached Simon Baron-Cohen, a prominent autism researcher on campus, to learn more. Baron-Cohen, it turned out, was building an exhaustive catalog of facial expressions to serve as a guide for those on the spectrum, and he allowed el Kaliouby to use the database to train her algorithm. Her face-reading code, “the Mind Reader,” became a reality in 2004. “If I could have done an Egyptian *zaghroota*, the ululation of joy my people make at weddings, I would have,” she confides.

Girl Decoded: A Scientist's Quest to Reclaim Our Humanity by Bringing Emotional Intelligence to Technology

Rana el Kaliouby with Carol Colman
Currency, 2020. 352 pp.



El Kaliouby writes with candor about the challenges she faced during her training. She was homesick, and Cambridge’s cold weather added to her misery. “I was lonely and my work was just creeping along,” she admits. She barely saw her husband, who had founded a software company in Egypt, and their friends joked that she got pregnant with the couple’s first child “over the Internet.”

In 2004, el Kaliouby had the chance to show her work to the woman who had originally inspired her to study emotion AI. Rosalind Picard, who was visiting the Cambridge Computer Laboratory, was extremely impressed with el Kaliouby’s work and offered her a postdoc position in the Affective Computing group at the Massachusetts Institute of Technology in Boston, Massachusetts.

El Kaliouby’s reminiscences offer glimpses into her background and cultural upbringing. We learn, for example, that Arab men are conventionally referred to as the fathers of their eldest sons; for instance, “Abu Mohammed” means “father of Mohammed.” If a man has no sons, then he is typically called by his own first name. El Kaliouby recounts how, once, when she was visiting her father’s office in Abu Dhabi, a male colleague referred to him as “Abu Rana.” She realized that her father must have spoken of her at work with pride, and by using this naming convention, his colleague was acknowledging the young woman’s achievements. “I was deeply touched by the gesture,” she writes.

In 2009, el Kaliouby and Picard founded the startup Affectiva to bring the emotion-sensing technology they had developed together in the laboratory to the marketplace. Many industries now put the company’s software to myriad uses: from social robotics and market research to monitoring systems that check for distraction or drowsiness in drivers. In 2018, el Kaliouby was named to *Fortune* magazine’s “40 Under 40” list of the most influential young people in the world of business.

Girl Decoded is an affecting memoir that highlights the tension between one woman’s upbringing and her aspirations. Such life stories, told well, have the power to uplift us all. ■

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10.1126/science.abc3555

Science

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Science **368** (6495), 1072.
DOI: 10.1126/science.abc3555

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