

I'm Rana el Kaliouby, Host of NOVA Wonders & CEO of Affectiva.
Ask me anything!

Rana_el_Kaliouby¹andr/ScienceAMAs¹

¹Affiliation not available

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Abstract

With AI becoming mainstream, how will it affect the way we interact with our devices and how we communicate with each other? My name is Rana el Kaliouby, and I'm an Egyptian-American scientist and entrepreneur on a mission to humanize technology. I care deeply about ethics and trust in AI, from considering algorithmic bias to ensuring consent and data privacy. As Co-founder and CEO of Affectiva, an MIT spin-off that builds artificial emotional intelligence ("Emotion AI"), my company uses cutting-edge software that analyzes complex and nuanced emotional and cognitive states from the human face and voice, ultimately engineering empathy. For me, teaching machines to measure and interpret human emotions has the potential to enhance consumer experiences, engage students and personalize their learning, allow doctors and nurses to deliver better care, increase road safety by tracking driver alertness, and enable people with autism to better communicate with their families and peers. I consider myself a role-model for young scientists who are considering careers in technology and entrepreneurship. As a female Muslim scientist who's one of a handful of women CEOs in the tech industry, I'm a huge advocate for diversity and inclusion— not just because it is the right thing to do, but because it is the only way we can design and build smart technologies for an increasingly global world. Today, I'm also a co-host on PBS NOVA's new series "NOVA Wonders," in which incredible scientists from all walks of life tackle some of the biggest questions about life and the cosmos. I believe that science is the vehicle for innovation, so I'm truly excited to be a part of "NOVA Wonders"— I especially love how NOVA shows that scientists come in all shapes, colors and sizes, thus providing diverse role-models that aspiring scientists can relate to and be encouraged by. I'm a World Economic Forum (WEF) Young Global Leader and I served on WEF's Global Future Council on AI and Robotics. I'm also a member of the Partnership on AI, which is concerned with ensuring that AI benefits society and is applied for good. A former research scientist at the MIT Media Lab with a PhD in computer vision and machine learning from the University of Cambridge, I use my voice to advocate for women in tech and for beneficial uses of AI— I'm often cited in and interviewed by top business and mainstream outlets, including The New Yorker, Wired, Forbes, Fast Company, The Wall Street Journal, The New York Times and TIME Magazine. Check out my TED talk and my Inc. column, and do make sure to watch PBS NOVA's episode on Can we Build a Brain, which premieres May 16 on PBS! Ask me anything about being a computer scientist, deep learning, building artificial emotional intelligence, the applications of it, ethics in AI or how its like to be a woman leader in tech. Thank you!

[REDDIT](#)

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RANA_EL_KALIOUBY [R/SCIENCE](#)

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Rana_el_Kaliouby , r/Science ,

Hi, so when will AI start advancing the medical field in a significant way?

[Riffie1](#)

Lots happening on this front:

- 1- Automating diagnosis / radiology - Check out awesome companies like ZebraMed and others.
- 2- Quantifying mental health: this is HUGE area where technology can help .. it can bring some objectivity in how assess, track, and evaluate mental health disorders. Steven Vannoy at UMass, Boston is looking at using Emotion Ai for early flagging of suicidal intent.

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3- Social inclusion e.g., helping individuals on the autism spectrum. Check out our partner, Brain Power - they are using Google Glass and Affectiva's technology to build social training tools for individuals on the autism spectrum. Very inspiring / powerful work.

Hi Rana, thank you for doing this AMA! I have really been enjoying the NOVA Wonders series, and I thought the recent episode about animal communication was extremely interesting. People like to talk about the fear of the unknown when it comes to the future of machine learning and AI, but positive applications like the researchers using machine learning to classify whale song and discovering that popular songs are transmitted group to group across the Pacific ocean are much more enlightening.

What kind of new deep learning or AI applications excite you the most, and how do you like to share your enthusiasm with the people around you? Thank you and looking forward to more great NOVA Wonders!

[asymptoticallynormal](#)

Thank you :) I was a featured scientist in the "Can we build a Brain" episode but I co-hosted "What are Animals Saying" and in doing both, I was struck that all the scientists in those two shows were trying to answer the same question from different perspectives. Animal scientists are using machine learning to DECODE how animals connect and communicate, and I am using machine learning to ENCODE machines that can connect and communicate with us. At the end of the day, its all about feeling connected - this deep connection that makes us feel loved, supported, celebrated and part of a greater purpose. Thats really what Emotion AI is about - its ultimately about re-imagining how we connect with machines, as well as how we as humans connect with one another! Re: AI application I am most excited about: Using Emotion AI to quantify mental health - such as depression, pain, Parkinson's and more.

Hi there!

I guess I'll ask a question about the ethics. So, what's the deal with ethics? Why is it bad to run algorithms on some data? I totally get why it is super problematic for private companies to have access to huge databases that others don't have access to, for the imbalance that this creates. But I don't get why a researcher needs an IRB to run an algorithm on data that float on the internet.

[lucaxx85](#)

There's a number of questions all rolled in to one in here :)

I will start with bias, which IMO is a real concern of AI. If we are not careful in how we train and deploy AI systems, we may accidentally perpetuate biases that exist in today in our society and build those biases into our AI systems. These includes biases against certain genders, ethnic groups etc. The good news a number of us are part of the Partnership on AI (PAI), which is a consortium of companies concerned about building and applying AI in a way that is beneficial to society. One of our goals with PAI is to build best practices and guidelines around ensuring that AI is fair, accountable, equitable and transparent.

Do you think AI has potential to not only diagnose tricky diseases but in the near future create new small and large molecules or even find antibodies with barely any off target effects and good binding affinity. A world where prescription drugs have like no side effects needs to happen ASAP. I feel like AI will dramatically speed up future drug discovery and it can also help with creating surgical robots that never make mistakes, bringing down complication rates for high risk surgery. I saw somewhere awhile

back that scientists created a robot arm that does open heart surgery extremely accurately. AI will surely change this world for the better.

[Encrypt0rj0nes](#)

Absolutely - some of your examples here are already happening. For instance, robotic surgery has transformed the field of surgery and will continue to do so. One of my favorite examples: Boston Children's Hospital uses 3D-printing technology to give doctors an opportunity to practice before they operate with the aim of avoiding surgical complications, reducing the length of operations, and ultimately cutting costs. 3D printing turned out to be particularly helpful when it comes to rare cases.

Do you think there is a risk of Artificial intelligence? Are you concerned about the risk of the singularity? What can be done to stop this?

I'm definitely not a scientist or well informed, but from my understanding, it seems like if you make a technology smart, or advanced enough to be "humanized" there will be dangers. Philosophically, to create a human technology, it would desire to be free just as humans desire freedom? Why are you confident in your technology to not become a threat to humanity? Basically, are we doomed?

[chaaarliee201](#)

No we are not doomed :) I do not worry about the existential threat of AI - and do not see AI taking over. My favorite answer to your question is a quote from AI Scientist Prof. Yann LeCun "The desire to dominate is not correlated with intelligence ... but it is correlated with testosterone". There is no reason that these AI systems will have any motivations to take over the world. Technology is neutral - thats always been true in the history of humanity - we are in control and we get to decide if we want to apply it for good or evil.

Empathy seems antithetical to machines and technology;it's human. Considering that, how do you design/create "Emotional artificial intelligence"? I'm curious about the actual nuts and bolts here of the process.

[chaaarliee201](#)

Hi there! Building Emotion AI is complex - because humans convey many "States of mind" through many channels (your facial expressions, your tone of voice, your gestures, your language etc). We use machine learning and a TON of data, to build algorithms that can read and respond to people's different expressions, cognitive and emotion states. For instance, we feed a deep neural network hundreds of thousands of examples of people smiling, smirking, frowning etc - examples from all around the world, of all ethnicities, and age groups - and the neural net learns how to differentiate between those different states. We are continuously feeding the system more data, so its always learning new and more nuanced / complex states.