

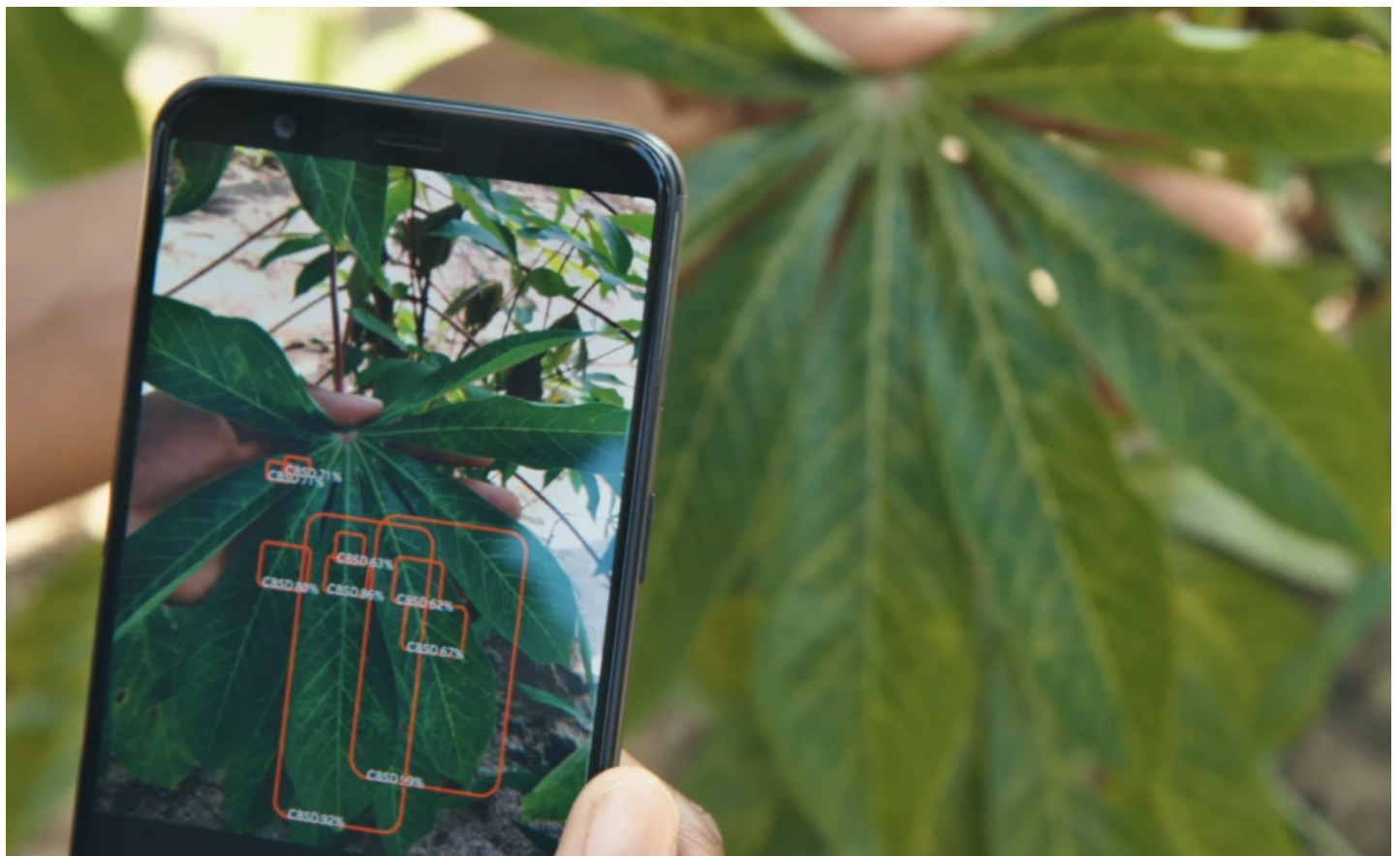
Artificial intelligence

The future of AI research is in Africa

In the last few years, the machine-learning community has blossomed, applying the technology to challenges like food security and health care.

by **Karen Hao**

June 21, 2019



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to Casablanca, and then take a three-and-a-half-hour drive to Tangier. What would have been a seven- to eight-hour direct flight was instead a nearly 24-hour odyssey. This is not unusual, she says.

The hassle of traveling within the region isn't the only thing making things difficult for Africa's research community: the difficulty of traveling *out* of the region has often left its researchers out of the international conversation. While these issues have affected every scientific field, they are amplified in AI research. The pace of innovation means, for example, that repeatedly missing conferences over visa problems—which have made it hard for African scientists to attend some of the world's largest AI events in the US and Canada—can easily cause a researcher to fall behind.

Despite the odds, the African machine-learning community has blossomed over the last few years. In 2013, a local group of industry practitioners and researchers began Data Science Africa, an annual workshop for sharing resources and ideas. In 2017, another group formed the organization Deep Learning Indaba, which now has chapters in 27 of the continent's 54 countries. University courses and other educational programs dedicated to teaching machine learning have burgeoned in response to increasing demand.

The international community has also taken note. In late 2013, IBM Research opened its first African office in Nairobi; it added another in Johannesburg, South Africa, in 2016. Earlier this year Google opened a new AI lab in Accra, Ghana, and next year ICLR, a major AI research conference, will host its event in Addis Ababa, Ethiopia.



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hand, might offer a context with which AI can return to its original promise: creating technology that tackles pressing global challenges like hunger, poverty, and disease.

“I think for anyone who’s looking for tough challenges,” says Wayua, “this is the place to be.”

The African model of innovation

Both IBM Research’s offices in Kenya and South Africa and Google’s AI lab in Ghana share the same mission as their parent organizations: to pursue fundamental and cutting-edge research. They focus on issues like increasing access to affordable health care, making financial services more inclusive, strengthening long-term food security, and streamlining government operations. The list is not unlike that for a lab located anywhere else in the world, but the context adds nuance to the objectives.

“Research cannot be detached from the environment in which it is performed,” says Moustapha Cisse, the director of Google AI Ghana. “Being in an environment where the challenges are unique in many ways gives us an opportunity to explore problems that maybe other researchers in other places would not be able to explore.”



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model, which works directly on farmers' phones without needing access to the internet, helps them intervene earlier to save their plants.

Wayua gives another example. In 2016, the Johannesburg team at IBM Research discovered that the process of reporting cancer data to the government, which used it to inform national health policies, took four years after diagnosis in hospitals. In the US, the equivalent data collection and analysis takes only two years. The additional lag turned out to be due in part to the unstructured nature of the hospitals' pathology reports. Human experts were reading each case and classifying it into one of 42 different cancer types, but the free-form text on the reports made this very time-consuming. So the researchers went to work on a machine-learning model that could label the reports automatically. Within two years, they had developed a successful prototype system, and they are now striving to make it scalable so it can be useful in practice.

“Technology is only half of the equation,” Wayua says. “The other half is being able to understand the problems that we see and being able to define them objectively in a way that science and engineering can address.”



IBM Research's office in Nairobi, Kenya.
courtesy of IBM Research

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accommodate the roughly 2,000 languages spoken in Africa. “It is by far the most linguistically diverse place on Earth,” says Cisse. “There’s a lot to learn and to research from that.”

The next generation

Cisse and Wayua share similar career trajectories. Each left Africa for higher education before coming back, hoping to apply their skills in ways that would maximize their impact. Cisse worked at Facebook in Europe while he waited for the right opportunity to return.



An African scientist teaching students.
courtesy of IBM Research

Now, both are deeply invested in developing more local educational opportunities for youth interested in AI. Cisse founded and directs the [African Master’s in Machine Intelligence](#), a one-year intensive program that operates learning programs around the region and brings in some of the best AI researchers around the world. Wayua’s lab hires high-performing undergraduates to work alongside full-time staff and pays for them to take the online master’s program in computer science offered by Georgia Tech University.

“The main resource for doing research is talented people, and you will find more talent in Africa than

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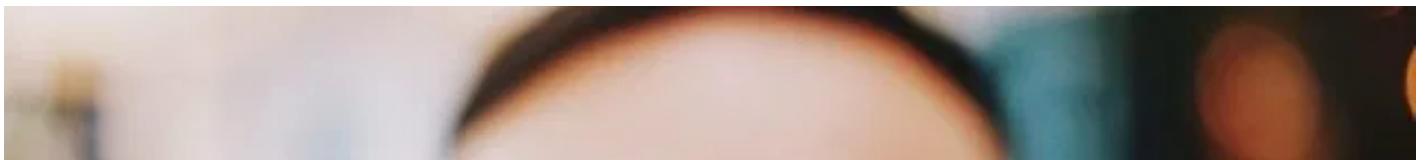
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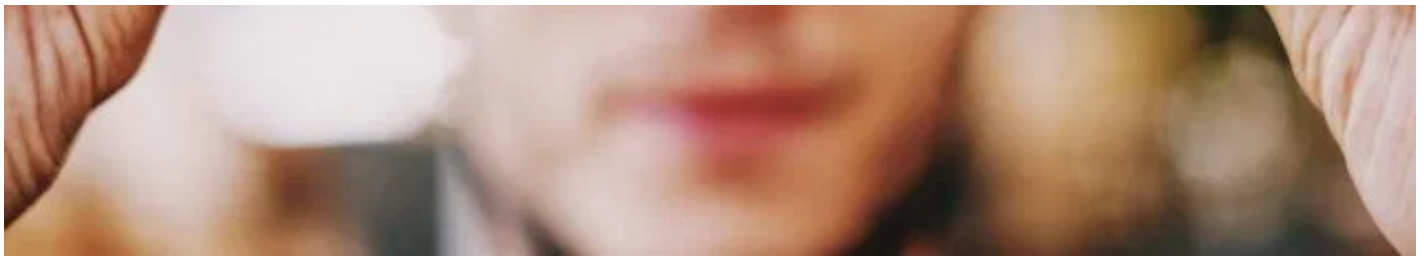


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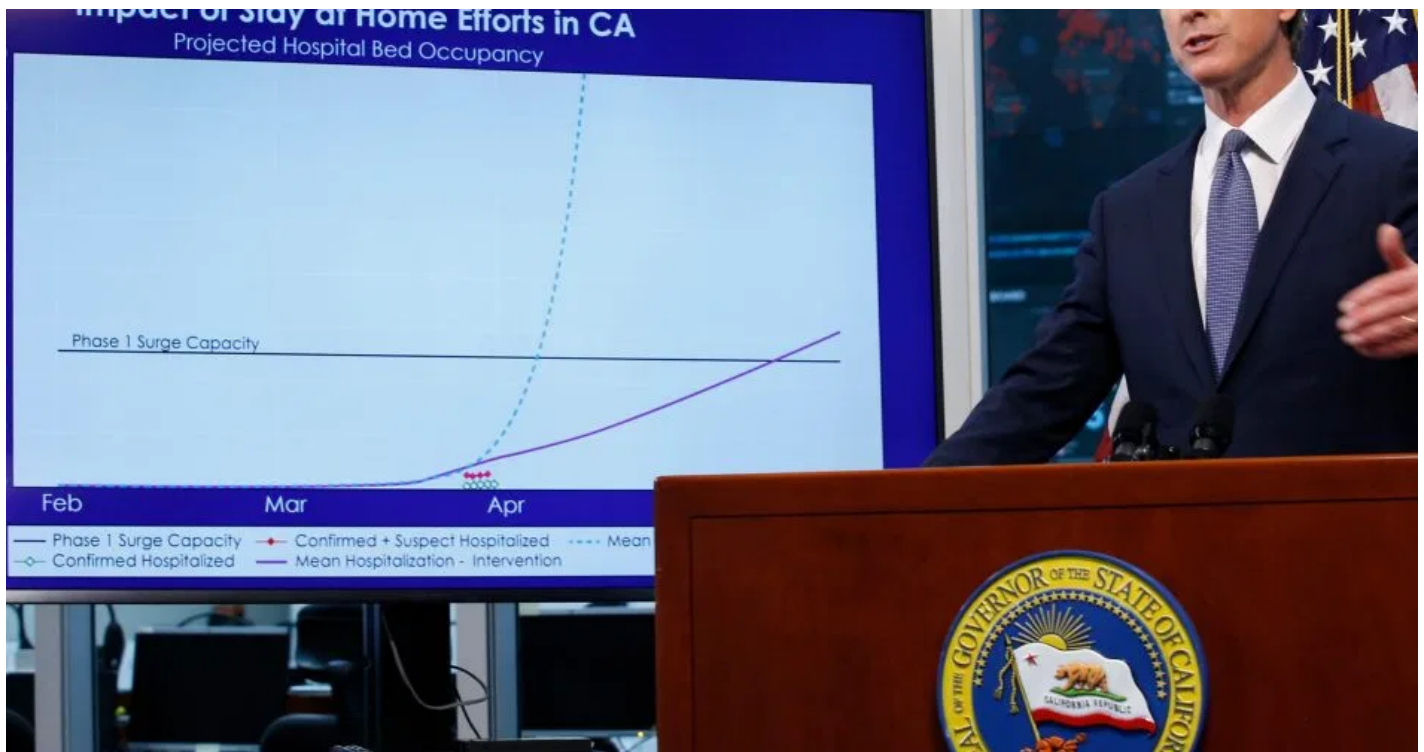


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