

AI will help to contain infectious bugs before they turn virulent

Indian techies use AI to also help neurosurgeons, oncologists

SHILPA PHADNIS & SUJIT JOHN | TNN

To understand which drug can work on which bacteria or other kinds of bugs, medical researchers have traditionally grown these bugs in laboratories, and applied the drug on the culture to see if it kills them. But it could take weeks to create those cultures.

Praapti Jayaswal and Avlokita Tiwari's AarogyaAI has adopted a different approach. They extract the DNA of the bug, sequence the DNA, annotate the whole sequence. That helps them figure out different mutations of the same bug. They have done this for the tuberculosis bacteria. They have also built algorithms for 14 of the most popular TB drugs, each of which works best on certain kinds of mutations.

Now, when a TB patient comes in, they take a DNA sequence from the patient, and their artificial intelligence (AI) system can quickly identify the particular form of the bacteria, and which drug will work best. Traditionally, it is often a trial and error process for the doctor, and arriving at an accurate treatment line could take a long time.

“We are able to identify exactly which drug will work for which patient, and 100 times faster than the existing gold standard (creating lab cultures) by using cutting edge technology. It takes two months to do lab cultures, and we are able to do it in a few hours,” says Jayaswal.

Researchers and entrepreneurs in India are using new-age digital technologies to solve some of the biggest problems in healthcare today. It's the kind of work that could one day make the likes of Covid-19 less frightening, one that identifies mutations quickly, one that predicts the patterns of evolution of bugs and future drug resistance patterns.

AarogyaAI's investors include Illumina, one of the largest genomics companies in the world, and American angel investors who invest in genomics companies – evidence of the quality of the work being done.

Dinesh Koka's Onward Assist is working with institutions like AIIMS Delhi, Tata Memorial Hospital, and Yale Institute of Public Health to build AI models that can look at a cancer biopsy slide, and help pathologists identify the areas of interest. Koka says oncologists look at a lot of data, yet the success rate of cancer treatment is very poor compared to other diseases. He says their AI tools not only ensure faster diagnosis, they provide advanced clinical information to an oncologist to take a more accurate treatment decision.

“The reporting time is down by 30-40%. More importantly, you are able to dramatically improve the productivity of the pathologist,” he says, adding this is especially important in countries like India where there is a severe shortage of good pathologists.

Laina Emmanuel and Rimjhim Agrawal's BrainSightAI is using signal processing, AI, 3D visualisation, and 3D modelling to build a neuroinformatics platform that can give unique insights into brain structure and functions. Emmanuel says it can answer questions like, does this person have early forms of dementia, will they move to amnesiac forms of dementia, does this patient with psychosis have schizophrenia with bipolar, or are there other indicators.

Their AI system looks at long functional MRI videos to figure out “the dance patterns” in the brain – something no radiologist can do. They then take all that information and map it back into the 3D space, so that the doctor can visualise it in the way she understands it best.

Jayaswal says investors have become more open to having discussions with deep tech companies. All three companies have been part of various accelerator programmes, including the GE Edison one in India. Emmanuel says for market creators like them, working with companies like GE helps to think about problems in a large-scale industrial way.

The platforms they are building in most cases can be applied in a host of other areas. “Bill Gates said the other day that the beauty of pathogen genetics is that it is pathogen agnostic. It means, what we are building today can be scaled to other infectious diseases that manifest antimicrobial resistance,” Jayaswal says.

TOWARDS FASTER AND BETTER DIAGNOSIS

“ Our neuroinformatics platform can give unique insights into brain structure and functions. It can answer questions like, does this person have early forms of dementia, will they move to amnesiac forms of dementia. It can help in better planning for brain tumour surgeries – should you approach the tumour from the right side or the left, with minimal functional loss for the patient.

Laina Emmanuel |
CO-FOUNDER &
CEO, BRAINSIGHTAI



BrainSightAI

► Has accelerator agreements with Dassault Systemes, GE-Edison, Netapp. Expected to join Microsoft's Amplify programme

► Has clinical agreement with Max Hospital, Saket. In conversation with 4 other hospitals

Investor: Entrepreneur First (pre-seed round). Seed round expected to be completed soon

“ AarogyaAI employs genomics and AI to give precision diagnosis and precision medicine for infectious diseases that are manifesting antimicrobial resistance. We are going after tuberculosis first because that's the most lethal disease globally, besides Covid-19 now. We are able to identify exactly which drug will work for which patient, and 100 times faster than the existing gold standard.

Praapti Jayaswal | CO-FOUNDER
& CEO, AAROGYAAI



AarogyaAI

Investors: Illumina (one of the largest genomics companies in the world), Entrepreneur First, American angel investors who invest in genomics companies

► Working with hospitals and National Reference Laboratories with large flow of TB patients



“ The success rate of cancer treatment is still very poor. A big challenge is, India has only about 600 expert cancer pathologists. We have built AI models structured to mimic the pathology process, look at a cancer biopsy slide, and help pathologists in identifying the areas of interest. It ensures faster diagnosis, and provides advanced clinical information to an oncologist to take a more accurate treatment decision.

Dinesh Koka | CO-FOUNDER & CEO, ONWARD ASSIST

Onward Assist

Investors: CIIE (IIMA), LetsVenture, BVR Mohan Reddy

Hospital partners: AIIMS Delhi, Tata Memorial Hospital, Yale Institute of Public Health

