FROM THE EDITOR

Tracking the AI Revolution

This week's issue on the promise of artificial intelligence would be much different if I had followed ChatGPT's initial take on the theme.

I asked it to "write a promotion for a themed newspaper issue all about AI," and it responded enthusiastically.

"Dive into the Future with Our Special Edition: 'AI Chronicles'!," was the headline of its teaser, and that's not including the emojis, which for some reason were a mixture of newspapers, stars and '50s-era robots.

ChatGPT promised that we would "unravel the mysteries and marvels of AI technology" through "captivating articles, insightful interviews and thought-provoking analyses."

I mean, it's not wrong. Just a bit more 'extra' for my tastes.

It was my initiation into the importance of the prompts we feed into AI engines. I asked it to tone it down by writing a serious promotion for the issue.

"Introducing 'AI Insights': Your Definitive Source for Understanding Artificial Intelligence," it responded, along with switching out the robot heads for microscope emojis for some reason.

"In an era where AI is revolutionizing industries, reshaping economies and redefining the very fabric of society, staying informed is paramount," it said, promising "the knowledge and perspective needed to navigate the AI-driven world."

And that, in a nutshell, is what we're trying to do this week with our AI issue.

I'll let ChatGPT take it from here.

"Don't miss out on this unparalleled opportunity to immerse yourself in the world of AI like never before. Grab your copy ... today and embark on a journey into the heart of the AI revolution!"

– Doug Buchanan
Editor-in-chief

HEALTHCARE

RESEARCHERS USING AI TO PINPOINT DIAGNOSES, TAILOR TREATMENTS

Central Ohio hospital systems and biotech spinoffs are increasingly deploying artificial intelligence to help clinicians and patients.

BY CARRIE GHOSE
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A diagnosis for a child's heart condition eluded doctors for five years as test after test came back negative.

Then Nationwide Children's Hospital data scientists tried ChatGPT, feeding it a list of eight symptoms, including irregular heartbeat and loss of muscle control.

The AI tool searched medical journals and listed five possible syndromes. Doctors had already eliminated four.

The fifth – largely confined to a few dozen children in an Anabaptist community in Alberta, Canada – has spontaneously occurred in a just a handful of patients worldwide.

"The patient had a mutation in that particular gene," said Peter White, newly appointed as the Columbus hospital's chief data sciences officer. "The technology was able to make that connection, where it was hard for a human to make that connection."

In healthcare, where the choice of drug or replacement heart valve can literally mean life or death, artificial intelligence is treated as a tool like a microscope.

Columbus hospital systems are both adopting and inventing AI tools to ease administrative burdens and speed data analysis to support decisions that ultimately are made by the clinician.

"Medicine is more about the human-human interaction. No AI can replace the real human beings,"


Ping Zhang

DAN TRITTSCHUH FOR CBF

said Ping Zhang, who leads the AI in Medicine lab at Ohio State University.

"I really hope AI can be a clinical tool or instrument … to make the doctor's life easier," he said.

Keeping humans in the loop

Successful AI spinouts from local health systems include Dasi Simulations LLC from Ohio State University, which developed a predictive tool for choosing a heart valve with a growing list of hospital customers.

And Deep Lens from Nationwide Children's offers digital pathology matching software that was acquired to join a technology suite to improve patient access and diversity in clinical trials.

> **"Medicine is more about the human-human interaction. No AI can replace the real human beings."**
>
> Ping Zhang, leader of the AI in Medicine lab at Ohio State University

Ohio State "absolutely" has potential for more spinouts, said Lakshmi Prasad Dasi, a biomedical engineer and Dasi Simulations co-founder and CTO.

"It's really important for the (principal investigators) and the university to recognize how to speed these innovations and translate them into the marketplace … helping facilitate these innovations to reach the end-user, which is the clinicians," he said.

Dasi's previous lab was in the middle of OSU Wexner Medical Center's specialty heart hospital. While developing the software that would spin out, he sat in on cardiologists' weekly meetings discussing their cases.

"That kind of feedback loop where you have researchers observing real pain points … that makes all the difference in developing solutions," Dasi said.

AI specialists moving to Columbus hospitals from for-profit corporations brought a similar maxim: Listen to the customer.

"I can develop several tools per year. However, physicians don't like a random tool," OSU's Zhang said.

An associate professor of computer science and engineering and biomedical informatics, Zhang joined Ohio State five years ago from IBM Corp.

While there, he sought uses of the Watson supercomputer for hospital and pharmaceutical clients and was inspired to start a lab for "human-centered AI."

At OhioHealth Corp., Drew Smith joined as chief data and analytics officer in March 2023 from Little Caesars Enterprises. He previously worked in data analytics for Ikea.

"I really love this stuff," Smith said. "I've always really appreciated AI for its capacity to help people be the best they can be at their jobs. … I can't think of a better place to apply that than healthcare."

Unlike industry, academia doesn't seek ROI on research in a year or two, Zhang said. A recently approved product from another school took 11 years.

Software that Zhang is refining to predict the likelihood of sepsis – a response to infection that can cause fatal organ failure – is at least five years from the market.

Over the past year, collaboration with OSU physicians greatly improved the technology, he said. A graduate student tweaked the algorithm to prompt clinicians to supply missing test results and rank which parameters are most important for reducing uncertainty.

Zhang's lab is now recruiting 50 doctors to use the software so he can refine it further before seeking FDA approval for software as a medical

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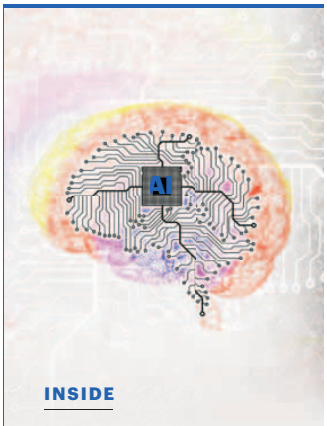

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device.

He's also developing a chatbot that patients receiving chemotherapy use to report side effects – providing more frequent feedback than office visits every few weeks.

OhioHealth is providing clinical feedback to several early-stage AI startups, Smith said, and is piloting existing products in administrative uses.

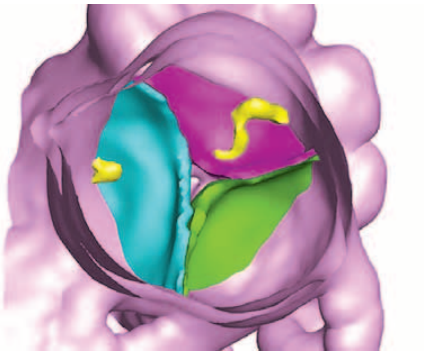
"The way we talk about it is ensuring you have a human in the loop," Smith said. "The clinician makes the call, all the time."

Using AI as a helper, magnifier

About 100 OhioHealth primary care doctors are testing Dax Copilot, a product from Microsoft AI subsidiary Nuance.

With patient permission, they record audio of office visits and the AI generates required notes in seconds.

"Even after the first day, it made a huge impact," said Dr. Andy Narcelles, OhioHealth's medical director for clinical informatics and a family physician in Blacklick.



DASI SIMULATIONS

Dasi Simulations software generates a 3D image of a diseased aortic heart valve from a CT scan.

One doctor said it was the first day in years she didn't need to stay late at the office.

"It's easier for them to have a draft they can edit as opposed to generate the whole notes themselves," Narcelles said, adding that accuracy is "a work in progress."

Patients in surveys have said they were comfortable with the technology, he said, and appreciated that doctors weren't typing throughout the visit.

"If you're working with a generative AI tool today, you're working with the worst version of that tool … because it gets better every day," Smith said.

At Mount Carmel Health System, a physician is leading a study to use AI and machine-learning to reduce racial and gender-based health disparities.

Dr. Laura Gravelin, co-director of Mount Carmel's women's heart program, was awarded $102,000 from medical device maker Medtronic, according to the hospital system's website.

She will use software to analyze the electronic health records of patients with heart failure to identify those who might be eligible for an implant that can prevent death from a sudden irregular heartbeat. Today, four in five eligible patients don't received counseling and those left out are disproportionately women and minorities.

At Nationwide Children's, researchers use machine-learning to review clinical notes and rank which of the 3 million possible variants in a person's genetic code are most important to test.

In-house technology to assess variants in cancer, called Ava, was trained on the hospital's nationwide repository of tumor samples.

Identifying the exact variant can help find treatments that were effective in similar patients. The tech is two or so years from reaching clinical use, White said.

The hospital's behavioral health researchers, not trained in writing software, are using language-based generative AI to extract information from complex data sets, without having to track down a data scientist.

"It gets you about 95% of the way there," White said.

What AI can't do

"AI in medicine holds a lot of promise to improve healthcare," Dasi said. "At the same time, we do need to be worried about any technology, not just because it's AI.

"We have to be careful about how that technology is used in a very responsible way."

Scientific experiments require showing the same results when repeating the same steps.

Purely computational machine-learning can do that. Generative AI, by definition, tends to give different answers every time.

For the patient with the rare heart condition, ChatGPT gave four wrong answers along with what turned out to be the correct one.

"Sometimes it's wrong. It's an overconfident teenager," White said. "You need a human in the loop … to fact check what you're seeing.

"Once that starts moving into a healthcare setting, there's got to be a lot of checks and balances."

OhioHealth so far is sticking to administrative applications such as note-taking and patient scheduling, Smith said, not using AI to help diagnose disease.

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Peter White is chief data sciences officer at Nationwide Children's Hospital.

"Diagnostics is too critical for us to rely on a tool that needs to get better," Smith said.

Equity is a major concern for clinicians exploring AI uses. An algorithm trained on the medical records of only white patients might not identify risks in a Black or Asian population.

"If you're not feeding it the right data and not asking the right questions, it might lead you to something wrong," Dasi said.

As with any technology, he said, AI requires safeguards against irresponsible uses.

"Every time there has been a major technological breakthrough in our world, there's always a population that's very excited and a population that's very worried about it," Dasi said.

"Some of it is just human nature, but some of it is real."

A WORD FROM OUR SPONSOR

STEVE WYLIE
General Manager / SVP, East Region
Trace3

TRACE3

Trace3 delivers business transformation. Our firm consults on, integrates, and operates convergent solutions across data, security, and cloud that embrace emerging technology and drive measurable business value for our clients. We are one of the few firms in the world that can consult on AI at any point along your digital transformation journey.

Here are just a few of our recent AI projects:

1. An entertainment client (casinos) sought to develop an AI Acceptable Use Policy to leverage as a foundation for the future of AI.
   - Trace3 interviewed key stakeholders across various departments, including commerce, gaming, health, and enterprise applications.
   - The team drafted an Acceptable Use Policy based on feedback and maturity of various departments, and then conducted AI awareness and readiness training.
2. A major health insurer required an improved solution to identify and protect patient data from unauthorized access. The current monitoring was not comprehensive, lacked precision, and resulted in a high number of false positives and an unknown number of undetected true positives.
   - Trace3 designed a new AI-based solution that improved accuracy, speed, and explainability of the current system-access tracker. The solution leveraged an ensemble approach that employed multiple models to reduce false positives, identify unusual behavioral patterns, and sort through volume anomalies. Trace3 also developed and deployed a production instance of the solution.
   - Trace3 conducted a Data & AI workshop for over 60 data and analytics leaders and architects at a well-known defense organization.
   - Trace3 shared leading practices driving the use of data and AI in business transformation, including perspectives and experiences in Gen AI, RAG Architecture, data fabric, adversarial AI, AI governance & compliance, and AI security.
   - The team provided guidance to client technical teams who are seeking to transform the organization through Responsible AI use.
3. A health care supply chain client wanted to use AI to improve its financial performance, increase new operating efficiency, and gain competitive advantage.
   - Trace3 conducted a series of education, discovery, and ideation workshops with leaders from all areas of the business. These workshops emphasized AI awareness, consensus building, collaboration, and out-of-the box thinking that established recommendations to executive leadership for strategic planning.
   - Leaders worked together to identify and prioritize a focused set of highly impactful and achievable AI use cases that will improve business performance and patient care.

If you'd like to learn more about how Trace3 can help you drive successful AI project implementation, check us out at **www.trace3.com.**