The Washington Post

Democracy Dies in Darkness

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A face-scanning algorithm increasingly decides whether you deserve the job

HireVue claims it uses artificial intelligence to decide who's best for a job. Outside experts call it 'profoundly disturbing.'

By **Drew Harwell**

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An artificial intelligence hiring system has become a powerful gatekeeper for some of America's most prominent employers, reshaping how companies assess their workforce — and how prospective employees prove their worth.

Designed by the recruiting-technology firm HireVue, the system uses candidates' computer or cellphone cameras to analyze their facial movements, word choice and speaking voice before ranking them against other applicants based on an automatically generated "employability" score.

HireVue's "AI-driven assessments" have become so pervasive in some industries, including hospitality and finance, that universities make special efforts to train students on how to look and speak for best results. More than 100 employers now use the system, including Hilton and Unilever, and more than a million job seekers have been analyzed.

But some AI researchers argue the system is digital snake oil — an unfounded blend of superficial measurements and arbitrary number-crunching that is not rooted in scientific fact. Analyzing a human being like this, they argue, could end up penalizing nonnative speakers, visibly nervous interviewees or anyone else who doesn't fit the model for look and speech.

The system, they argue, will assume a critical role in helping decide a person's career. But they doubt it even knows what it's looking for: Just what does the perfect employee look and sound like, anyway?

"It's a profoundly disturbing development that we have proprietary technology that claims to differentiate between a productive worker and a worker who isn't fit, based on their facial movements, their tone of voice, their mannerisms," said Meredith Whittaker, a co-founder of the AI Now Institute, a research center in New York.

"It's pseudoscience. It's a license to discriminate," she added. "And the people whose lives and opportunities are literally being shaped by these systems don't have any chance to weigh in."

Loren Larsen, HireVue's chief technology officer, said that such criticism is uninformed and that "most AI researchers have a limited understanding" of the psychology behind how workers think and behave.

Larsen compared algorithms' ability to boost hiring outcomes with medicine's improvement of health outcomes and said the science backed him up. The system, he argued, is still more objective than the flawed metrics used by human recruiters, whose thinking he called the "ultimate black box."

"People are rejected all the time based on how they look, their shoes, how they tucked in their shirts and how 'hot' they are," he told The Washington Post. "Algorithms eliminate most of that in a way that hasn't been possible before."

The AI, he said, doesn't explain its decisions or give candidates their assessment scores, which he called "not relevant." But it is "not logical," he said, to assume some people might be unfairly eliminated by the automated judge.

"When 1,000 people apply for one job," he said, "999 people are going to get rejected, whether a company uses AI or not."

On Wednesday, a prominent rights group, the Electronic Privacy Information Center, filed an official complaint urging the Federal Trade Commission to investigate HireVue for "unfair and deceptive" practices. The system's "biased, unprovable and not replicable" results, EPIC officials wrote, constitute a major threat to American workers' privacy and livelihoods.

The inscrutable algorithms have forced job seekers to confront a new kind of interview anxiety. Nicolette Vartuli, a University of Connecticut senior studying math and economics with a 3.5 GPA, said she researched HireVue and did her best to dazzle the job-interview machine. She answered confidently and in the time allotted. She used positive keywords. She smiled, often and wide.

But when she didn't get the investment banking job, she couldn't see how the computer had rated her or ask how she could improve, and she agonized over what she had missed. Had she not looked friendly enough? Did she talk too loudly? What did the AI hiring system believe she had gotten wrong?

"I feel like that's maybe one of the reasons I didn't get it: I spoke a little too naturally," Vartuli said. "Maybe I didn't use enough big, fancy words. I used 'conglomerate' one time."

HireVue said its system dissects the tiniest details of candidates' responses — their facial expressions, their eye contact and perceived "enthusiasm" — and compiles reports companies can use in deciding whom to hire or disregard.

Job candidates aren't told their score or what little things they got wrong, and they can't ask the machine what they could do better. Human hiring managers can use other factors, beyond the HireVue score, to decide which candidates pass the first-round test.

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The system, HireVue said, employs superhuman precision and impartiality to zero in on an ideal employee, picking up on telltale clues a recruiter might miss.

Major employers with lots of high-volume, entry-level openings are increasingly turning to such automated systems to help find candidates, assess résumés and streamline hiring. The Silicon Valley start-up AllyO, for instance, advertises a "recruiting automation bot" that can text-message a candidate, "Are you willing to relocate?" And a HireVue competitor, the "digital recruiter" VCV, offers a similar system for use in phone interviews, during which a candidate's voice and answers are analyzed by an "automated screening" machine.

But HireVue's prospects have cemented it as the leading player in the brave new world of semi-automated corporate recruiting. It says it can save employers a fortune on in-person interviews and quickly cull applicants deemed subpar. HireVue says it also allows companies to see candidates from an expanded hiring pool: Anyone with a phone and Internet connection can apply.

Nathan Mondragon, HireVue's chief industrial-organizational psychologist, told The Post the standard 30-minute HireVue assessment includes half a dozen questions but can yield up to 500,000 data points, all of which become ingredients in the person's calculated score.

The employer decides the written questions, which HireVue's system then shows the candidate while recording and analyzing their responses. The AI assesses how a person's face moves to determine, for instance, how excited someone seems about a certain work task or how they would behave around angry customers. Those "Facial Action Units," Mondragon said, can make up 29 percent of a person's score; the words they say and the "audio features" of their voice, like their tone, make up the rest.

"Humans are inconsistent by nature. They inject their subjectivity into the evaluations," Mondragon said. "But AI can database what the human processes in an interview, without bias. ... And humans are now believing in machine decisions over human feedback."

To train the system on what to look for and tailor the test to a specific job, the employer's current workers filling the same job — "the entire spectrum, from high to low achievers" — sit through the AI assessment, Larsen said.

Their responses, Larsen said, are then matched with a "benchmark of success" from those workers' past job performance, like how well they had met their sales quotas and how quickly they had resolved customer calls. The best candidates, in other words, end up looking and sounding like the employees who had done well before the prospective hires had even applied.

After a new candidate takes the HireVue test, the system generates a report card on their "competencies and behaviors," including their "willingness to learn," "conscientiousness & responsibility" and "personal stability," the latter of which is defined by how well they can cope with "irritable customers or co-workers."

Those computer-estimated personality traits are then used to group candidates into high, medium and low tiers based on their "likelihood of success." Employers can still pursue candidates ranked in the bottom tier, but several interviewed by The Post said they mostly focused on the ones the computer system liked best.

HireVue offers only the most limited peek into its interview algorithms, both to protect its trade secrets and because the company doesn't always know how the system decides on who gets labeled a "future top performer."

The company has given only vague explanations when defining which words or behaviors offer the best results. For a call center job, the company says, "supportive" words might be encouraged, while "aggressive" ones might sink one's score.

HireVue said its board of expert advisers regularly reviews its algorithmic approach, but the company declined to make the system available for an independent audit. The company, Larsen said, is "exploring the use of an independent auditor right now, to see how that could work."

HireVue launched its AI assessment service in 2014 as an add-on to its video-interview software, which more than 700 companies have used for nearly 12 million interviews worldwide. The Utah-based company won't disclose its revenue, the cost for employers or a full list of clients.

The company said last month that the private-equity giant Carlyle Group would become its new majority investor, providing an undisclosed sum from an $18.5 billion fund. Patrick McCarter, a managing director at the investment firm — which uses HireVue's video interviews internally and said it "will look to deploy AI-driven candidate assessments over time" — said the money would help the company expand to more employers and more specialized job openings, both in the United States and around the world.

At the hotel giant Hilton International, thousands of applicants for reservation-booking, revenue management and call center positions have gone through HireVue's AI system, and executives credit the automated interviews with shrinking their average hiring time from six weeks to five days.

Sarah Smart, the company's vice president of global recruitment, said the system has radically redrawn Hilton's hiring rituals, allowing the company to churn through applicants at lightning speed. Hiring managers inundated with applicants can now just look at who the system ranked highly and filter out the rest: "It's rare for a recruiter to need to go out of that range," she said.

At the consumer goods conglomerate Unilever, HireVue is credited with helping save 100,000 hours of interviewing time and roughly $1 million in recruiting costs a year. Leena Nair, the company's chief human resource officer, said the system had also helped steer managers away from hiring only "mini-mes" who look and act just like them, boosting the company's "diversity hires," as she called them, by about 16 percent.

"The more digital we become, the more human we become," she added.

Dane E. Holmes, the global head of human-capital management at HireVue client Goldman Sachs, wrote in the Harvard Business Review this spring that the banking giant's roughly 50,000 video-interview recordings were "a treasure trove of data that will help us conduct insightful analyses."

The investment bank said it uses HireVue's video-interview system but not its computer-generated assessments. But Holmes said data from those videos could help the company figure out how candidates' skills and backgrounds might correspond to how well they would work or how long they would stay at the firm. The company, he added, is also "experimenting with résumé-reading algorithms" that would help decide new hires' departments and tasks.

"Can I imagine a future in which companies rely exclusively on machines and algorithms to rate résumés and interviews? Maybe, for some," he wrote. (The "human element" of recruiting, he pledged, would survive at Goldman Sachs.)

HireVue's expansion has also helped it win business from smaller groups such as Re:work, a Chicago nonprofit organization that trains unemployed local job seekers for careers in the tech industry. Shelton Banks, the group's chief, said HireVue had proved to be an irreplaceable guide in assessing which candidates would be worth the effort.

The nonprofit organization once allowed almost anyone into its intensive eight-week training program, but many burned out early. Now, every candidate goes through the AI assessment first, which ranks them on problem-solving and negotiation skills and helps the group determine who might have the most motivation, curiosity and grit.

"Knowing where that person is at a starting place, when it comes to this person's life," Banks said, "can help us make more accurate assessments of the people we're saying yes or no to."

But Lisa Feldman Barrett, a neuroscientist who studies emotion, said she is "strongly skeptical" that the system can really comprehend what it's looking at. She recently led a team of four senior scientists, including an expert in "computer vision" systems, in assessing more than 1,000 published research papers studying whether the human face shows universal expressions of emotion and how well algorithms can understand them.

The systems, they found, have become quite perceptive at detecting facial movements — spotting the difference, say, between a smile and a frown. But they're still worryingly imprecise in understanding what those movements actually mean and woefully unprepared for the vast cultural and social distinctions in how people show emotion or personality.

Look at scowling, Barrett said: A computer might see a person's frown and furrowed brow and assume they're easily angered — a red flag for someone seeking a sales associate job. But people scowl all the time, she said, "when they're not angry: when they're concentrating really hard, when they're confused, when they have gas."

Luke Stark, a researcher at Microsoft's research lab in Montreal studying emotion and AI — who spoke as an individual, not as a Microsoft employee — was similarly skeptical of HireVue's ability to predict a worker's personality from their intonations and turns of phrase.

Systems like HireVue, he said, have become quite skilled at spitting out data points that seem convincing, even when they're not backed by science. And he finds this "charisma of numbers" really troubling because of the overconfidence employers might lend them while seeking to decide the path of applicants' careers.

The best AI systems today, he said, are notoriously prone to misunderstanding meaning and intent. But he worried that even their perceived success at divining a person's true worth could help perpetuate a "homogenous" corporate monoculture of automatons, each new hire modeled after the last.

The company, HireVue's Larsen said, audits its performance data to look for potentially discriminatory hiring practices, known as adverse impacts, using "world-class bias testing" techniques. The company's algorithms, he added, have been trained "using the most deep and diverse data set of facial action units available, which includes people from many countries and cultures."

HireVue's growth, however, is running into some regulatory snags. In August, Illinois Gov. J.B. Pritzker (D) signed a first-in-the-nation law that will force employers to tell job applicants how their AI-hiring system works and get their consent before running them through the test. The measure, which HireVue said it supports, will take effect Jan. 1.

State Rep. Jaime Andrade Jr. (D), who co-sponsored the bill, said he pushed the transparency law after learning how many job applicants were rejected at the AI stage of a job interview. He worried that spoken accents or cultural differences could end up improperly warping the results, and that people who declined to sit for the assessment could be unfairly punished by not being considered for the job.

"What is the model employee? Is it a white guy? A white woman? Someone who smiles a lot?" he said. "What are the data points being used? There has to be some explanation, and there has to be consent."

HireVue cautions candidates that there is no way to trick, cheat or hack the system, because it assesses tens of thousands of factors to assess a "unique set of personal competencies." "Do what feels most natural to you," the company says in an online guide.

But roughly a dozen interviewees who have taken the AI test — including some who got the job — told The Post it felt alienating and dehumanizing to have to wow a computer before being deemed worthy of a company's time.

They questioned what would be done with the video afterward and said they felt uneasy about having to perform to unexplained AI demands. Several said they refused to do the interview outright because, in the words of one candidate, the idea "made my skin crawl."

Candidates said they have scrambled for ideas on how to maximize their worthiness before the algorithm's eye, turning to the hundreds of videos and online handbooks suggesting, for instance, that they sit in front of a clean white wall, lest the background clutter dock their grade. "Glue some googly eyes to your webcam. It'll make it easier to maintain eye contact," one user on the message board Reddit suggested.

Stark, the AI researcher, said these "folk theories of algorithms" were a natural response from people facing impenetrable AI systems with the power to decide their fate. The survival techniques could feel reassuring, he said, even if they were wrong: Pick the right words, use the right tone, put on a sufficiently happy face. "It's a way of trying to give people confronting an opaque system they don't understand some feeling of agency," he said.

But some HireVue interviewees questioned whether it was fair or even smart to judge a person's workplace performance or personal abilities based on half an hour spent looking into a webcam. They also worried that people's nerves about the odd nature of the exam might end up disqualifying them outright.

Emma Rasiel, an economics professor at Duke University who regularly advises students seeking jobs on Wall Street, said she has seen a growing number of students excessively unsettled about their upcoming HireVue test. The university's economics department now offers a guide to HireVue interviews on its student resources website, including typical questions ("What does integrity mean to you?") and behavioral tips ("Act natural, talk slowly!").

"It's such a new and untried way of communicating who they are that it adds to their anxiety," Rasiel said. "We've got an anxious generation, and now we're asking them to talk to a computer screen, answering questions to a camera … with no real guidelines on how to make themselves look better or worse."

The mysterious demands can also push people's angst into overdrive. When Sheikh Ahmed, a 25-year-old in Queens, applied for teller jobs at banks around New York, he said he received eight HireVue assessment offers, all scheduled for the same day.

He studied guides on how to talk and act but found the hardest part was figuring out the camera angle: Too high, he worried, and he would look domineering; too low, and he would look shrunken and weak.

Before his marathon of AI interviews, he put on a crisp dress shirt, a tie and pajama pants and went to his dad's soundproof music studio, away from the family's chirping society finch. He also turned off his air conditioning system, hoping the background noise wouldn't mess up his score.

He changed his answers slightly in each interview, in the hopes that the algorithm would find something it liked. But he found it exhausting and disheartening to boil down his life experience and worthiness into a computer-friendly sound bite.

By the end, his mouth was dry, he was covered in sweat and he was paranoid he hadn't made enough eye contact while worrying about the bird. A few weeks after the interviews, he said, he's still waiting to hear whether he got a job.

Correction: Due to incorrect information from Goldman Sachs, The Post misreported in an earlier version of this story that the investment bank used HireVue's AI-driven assessment program. Goldman Sachs representatives said they only use HireVue's video-interview system, not its automated assessments.

Drew Harwell

Drew Harwell is a technology reporter for The Washington Post covering artificial intelligence and the algorithms changing our lives. He joined The Post in 2014 and has covered national business and the Trump companies. Follow 🐦

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mountainlake1   3 months ago

This is truly frightening.

Like 👍 8   Link 🔗   Report ⚑

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msame   4 months ago

Bonkers. I think hiring managers just don't want to take responsibility for hiring decisions. But hiring based on looks alone— that's nonsense, and potentially discriminatory.

Like 👍 4   Link 🔗   Report ⚑

DontBlowSmoke   4 months ago

Unbelievable. The current "smart technology" in Applicant Tracking Systems involves resumé parsers. A quick story: I pasted my resumé into a simulator of these parsers. It told me my resumé was full of grammar errors and interpreted my job title, UX Designer, as Unix

programmer. This in the era when UX Designer is a COMMON job title. So just think how well this secret algorithm performs.

Like 👍 7   Link 🔗   Report 🚩

Ted-Faraone   4 months ago

Back to 1984. Really, if a human resources person needs a machine to evaluate job applicants the person ought not to be in human resources. When I hired PR people I gave them a writing test. Very simple. An intentionally jumbled set of facts out of which they had to make a 300 word press release. It worked, and it had nothing to do with their tone of voice, accent, height, weight, skin color, gender, or facial expressions.

Like 👍 10   Link 🔗   Report 🚩

Edisadog   4 months ago

This is for companies who want people to do anything they are instructed to do.
Soon orgs. will skip the applicants and just hire the AI.

Like 👍 4   Link 🔗   Report 🚩

Jungle_Bob   4 months ago

Would this technology be allowed in police interrogations? In courtroom testimony?
This is over the top. Orwellian.

Are the algorithms customized for different corporate cultures? So all new hires have model-like looks and are expressive. Do these organizations state upfront that "Introverts need not apply?"

Like 👍 12   Link 🔗   Report 🏳

Ronjaboy   4 months ago

I'm so glad that I no longer have to put up with bs such as this!

Like 👍 6   Link 🔗   Report 🏳

Edisadog   4 months ago

Has HireVue contracted with any government agencies?

Like 👍 2   Link 🔗   Report 🏳

Edisadog   4 months ago

We the people need to hire them to replace the host of the next debate.
Who knows and will do the best job in support of the Constitution?

Like 👍   Link 🔗   Report 🏳

Edisadog   4 months ago

Then interview Trump and compare the results.

Like 👍 4   Link 🔗   Report 🏳

MollyG   4 months ago

So companies are having so many applicants that they need to resort to this to narrow down the list? I thought that this was an economy of full employment?

Like 👍 8   Link 🔗   Report 🏳