CASE STUDY #1

HIREVIEW

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HireVue Case

Introduction

HireVue is a "Talent Experience Platform" software that allows companies to standardize the candidate engagement process through conversational AI, video interviewing, assessments, and automated scheduling. Fortune 500 companies, small businesses, academic institutions, and government agencies are able to automate workflows to scale hiring. HireVue says its AI assessments "give recruiters a standard, structured, and fair way to screen many candidates, in a shorter time and at lower cost than traditional human-led interviews."

Context of Algorithm's Use

Purpose:

HireVue uses an algorithm to assess job applicant's qualifications via an automated video interview platform based using its competency framework, in addition to various facial characteristics (i.e., facial geometry). According to the company,
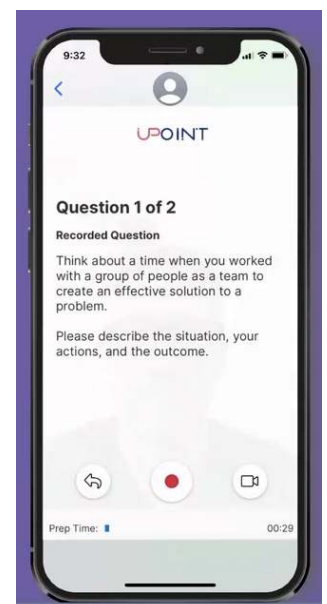
there are "thousands of data points" in each job candidate's recorded video interview that are collected and used to assess the candidate's cognitive ability, personality traits, emotional intelligence, and social aptitude. According to Nathan Mondragon of HireVue, the company uses facial analysis software to capture microexpressions to use as points that "roll together to give certain emotions and traits of personality".
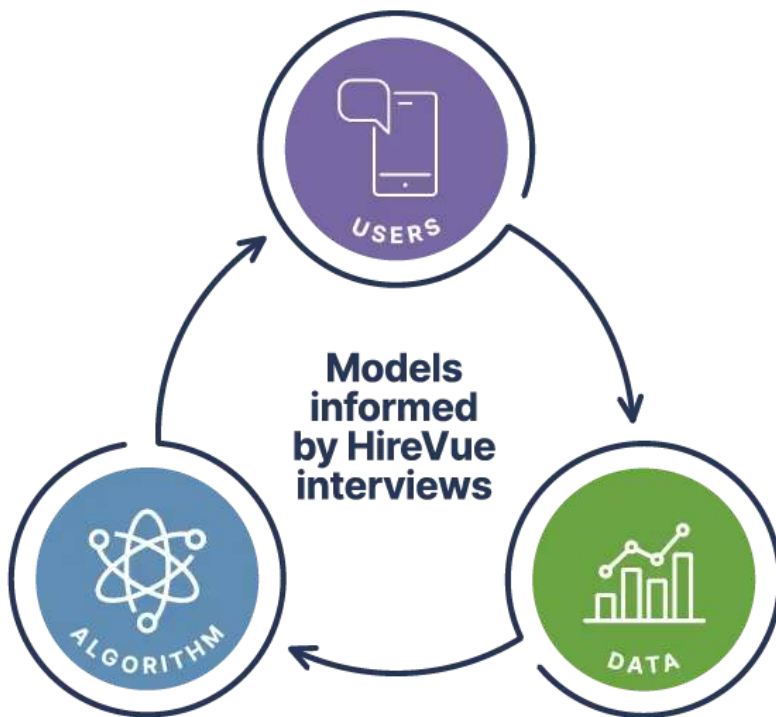
[1]

After the interview data is captured, the algorithm produces a single comprehensive assessment of each candidate (score out of 100) which can be used to compare candidates against one another. HireVue asserts that it is a processor of personal data but that the ultimate decision as to what action is taken based on that information always remains with the employer (the controller of data). The company offers a post-assessment report that makes it clear to candidates what is being tested for in relation to the position for which they are applying

HIREVUE COMPETENCY FRAMEWORK

WORK WITH PEOPLE

Emotional Intelligence
Empathy, Influence, Collaboration, Impulse Control

Communication

Team Orientation

Negotiation & Persuasion

Service Orientation

Relationship Building

Developing Others

Coordination of People & Resources

PERSONALITY & WORK STYLE

Big Five Personality Traits

Dependability

Composure

Adaptability

Willingness to Learn

Drive For Results & Initiative

Compassion

Safety & Compliance

WORK WITH INFORMATION

Cognitive Ability
Reasoning, Visuospatial Ability, Mental Agility, Numerical Ability

Problem Solving

TECHNICAL SKILLS

Coding Proficiency

Job-Specific Knowledge

Language Proficiency

Writing Skills

Interview	▶	Tier	▶	Action
OnDemand Interview Complete		Top Tier 67 - 100%		Recruiter to Advance candidate to [Next Step]
		Middle Tier 36 - 66%		Recruiter to view interview and Advance to [Next Step], put on Hold, or Reject accordingly
		Low Tier 0 - 33%		Recruiter to view interview (if volumes are insufficient) and put on Hold, or Reject accordingly
		Insufficient Data (-2)		Issue a retake

Interview questions and scoring jointly designed by HireVue and hiring company

Final decision on next steps and whether to hire taken entirely by the hiring company

Scope of Problem:

1. Are facial characteristics a reliable way (i.e., valid) for predicting applicants' scores? To what extent do other variables play a role in predicting a score? (e.g., glasses, skin tone, hairstyle, headscarf, candidate's room background, room lighting etc.) (reference)

2. Is there disparity in algorithmic performance between applicants of different U.S. races/ethnicities and between people who are disabled (i.e., mental impairment such as autism) vs. not?

Socio/Political Environment:

HireVue's technology falls under a category classified by the FTC as "facial recognition technology," which includes "technologies that merely detect basic human facial geometry; technologies that analyze facial geometry to predict demographic characteristics, expression, or emotions; and technologies that measure unique facial biometrics."

[2]

- In 2018, the city of San Francisco banned the use of HireVue by city agencies, citing concerns about discrimination.[3]
- In 2019, The Electronic Privacy Information Center (EPIC) filed a complaint with the FTC alleging that the company engaged in unfair trade practices in violation of the FTC Act by using biometric data and secret algorithms in a manner that causes substantial and widespread harm.
- In 2019, the state of California passed a law requiring companies that use video interviewing platforms to disclose how the platforms work and to provide candidates with the opportunity to opt out of being interviewed by video.[4]
- In 2020, the Equal Employment Opportunity Commission (EEOC) opened an investigation into HireVue, alleging that the company's video interviewing platform discriminates against people of color and people with disabilities. The investigation is still ongoing.[5]
- On January 31, 2023, the Equal Employment Opportunity Commission (EEOC) had a hearing to discuss the potential for artificial intelligence (AI) and automated systems to be used in a discriminatory manner in employment decisions. The hearing featured testimony from a number of experts, including Dr. Ifeoma Ajunwa, a professor of law at the University of North Carolina School of Law. Dr. Ajunwa testified that AI and automated systems are at risk of perpetuating existing biases in society, and that employers should take steps to mitigate these risks. Some key takeaways from it:

- AI and automated systems are at risk of perpetuating existing biases in society.
- Employers should take steps to mitigate these risks, such as by using AI in a transparent and accountable manner.
- The EEOC is currently considering whether to take further action on the issue of AI and employment discrimination.[6]

Stakeholders:

- *Employers:* Companies that use HireVue to conduct employee screening through automated video and written job interviews
- Hiring agencies/managers: People who make a decision based on the outcome
- HireVue Internal Teams:

- Model development team/data engineers etc. who will use the data to fine tune and monitor the model
- Policy teams who will provide guidance and set thresholds for external users

- *Candidates:* People who apply for jobs using HireVue and are affected by its decisions
- *Government agencies:* Agencies that regulate the use of technology in hiring and ensure enforcement, such as the FTC and Equal Employment Opportunity Commission (EEOC)
- *Privacy advocates:* Groups that are concerned about the privacy of biometric data
- *Civil rights groups:* Groups that are concerned about discrimination in hiring
- *Academics:* Researchers who study the use of technology in hiring
- *Public:* People whose livelihood is impacted by hiring technology
- *Families:* Families of the candidates who would be negatively impacted by hiring discrimination.
- *Investors:* People who monetarily invested in the software, any lawsuit payouts or profits gained by its use
- *Employees:* People who work at HireVue
- *Partners/Suppliers:* Companies that provide goods or services to HireVue

Inputs

HireVue's product is most often used as an automated screening tool at the start of the hiring process for high-volume employers. Structured recorded video interviews are typically based on a customized job analysis for the role and applicants are asked to respond to a series of questions. HireVue's software assesses the applicant's suitability for a role by analyzing applicants' responses, speech and facial expressions.

Types of Data:

- HireVue states that its algorithmic assessments will reveal the "cognitive ability," "psychological traits," "emotional intelligence," and "social aptitudes" of job candidates. The company collects "tens of thousands of data points" from each video interview of a job candidate, including but not limited to a candidate's "intonation," "inflection," and "emotions."
- Demographic data, address/postal code

Collection Process:

- Candidate submits an application, including a resume.
- The assessment which applicants take matches the competency requirements of the position for which they are applying. A typical assessment will consist of:
- **3-6 video interview questions** (delivered asynchronously) designed by HireVue's IO Psychology team to elicit behavioral responses related to a specific competency (e.g., customer service)
- **2-3 game questions** that are designed to measure general mental abilities (e.g. numerical reasoning) or five personality areas (e.g. conscientiousness). Different games give insight into a range of cognitive skills, including numeracy, problem-solving, and attention, as well as non-cognitive abilities, such as personality, empathy and influence.

- Data such as a candidate's tone of voice, micro expressions, word choice clustering, and eye and eyebrow expressions and thousands of data points as inputs into "predictive algorithms" that allegedly determine each job candidate's "employability." According to Hirevue, facial expressions can make up 29 percent of a candidate's employability score and the remainder of the score is based on the language used.[7] HireVue does not give candidates access to their assessment scores or the training data, factors, logic, or techniques used to generate each algorithmic assessment.
- PII Data storage/governance - HireVue stores personal data based on the retention period (for the amount of time) chosen by the potential employer after which it is discarded by HireVue. Candidates can request that their personal data be deleted at any point in the process.

Algorithm

AI technology is used in video interviews for:

1. transcribing spoken words to text (Machine Learning)
2. understanding what that text means (NLP)
3. assessing/ scoring the candidate's answers following expert human rater evaluations of answers to the same competency-based question (Machine Learning)
4. assessing a candidate's facial expressions
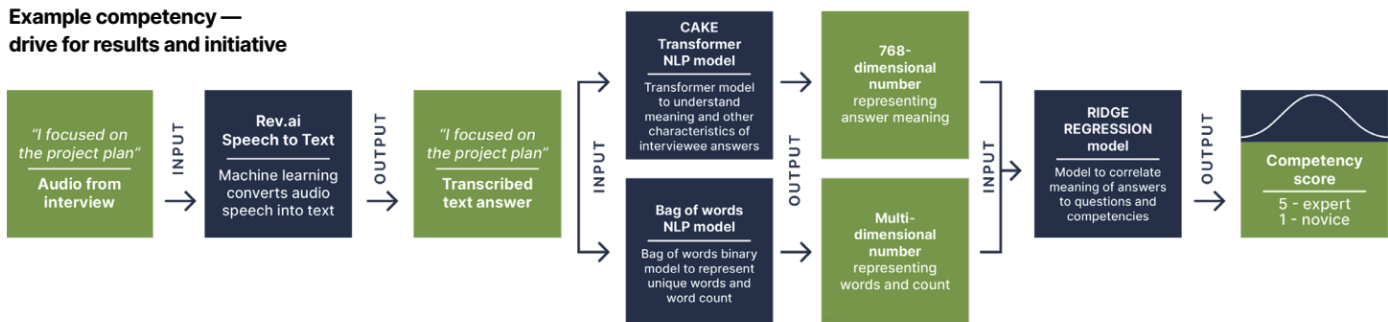
*Resulting Filter Effe*cts (algo. trained/mapped on)

- According to HireVue's CEO, AI and automation are supposed to remove bias from the hiring process by providing a fair and level playing field for candidates and assessments don't consider age, race, gender, or data on one's resume such as GPA or the college attended
- As can be demonstrated from the image below, bias can creep into the recruitment process at different junctures


- Basing employability from microexpressions is not an exact science because there are no standard expression of data that demonstrate valid connections to jobs and skills
- AI and automated hiring systems can view certain microexpressions as negative when they are measured against a certain group of people's demographic and culture. This can unjustly exclude people who have different micro expressions based upon a different culture, gender, or disability

Decision Procedure

The ultimate decision being made by the algorithm is whether the candidate is classified in the low, medium or top tier based on a comprehensive score that is assigned to the individual.
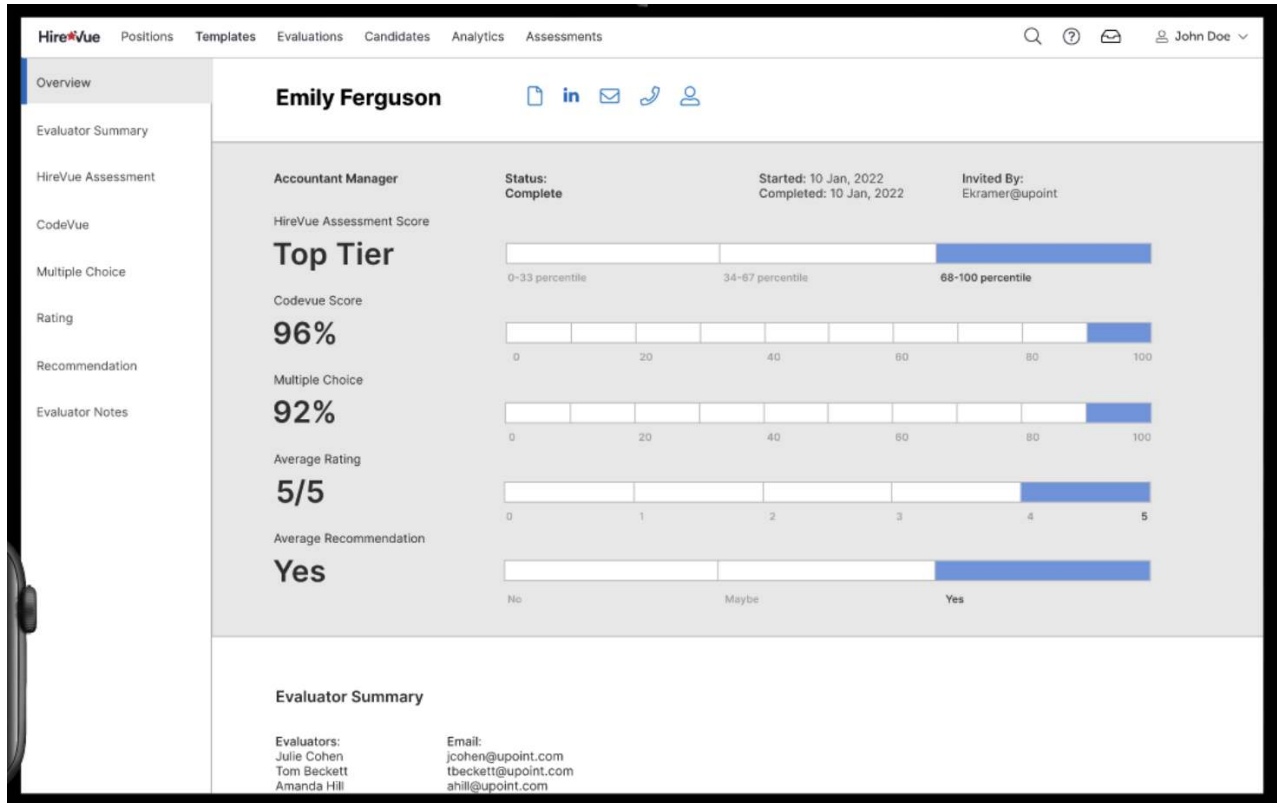
Actions Taken

Consequential Impact:

The consequential impact of HireVue is still being debated. Some people believe that HireVue is a valuable tool that can help employers to make more objective hiring decisions. They argue that HireVue can help to level the playing field for candidates, as it allows them to interview for jobs from anywhere in the world. They also argue that HireVue can help employers to save time and money, as they do not have to travel to interview candidates in person.

Others are concerned about the potential for HireVue to be used in a discriminatory manner. They argue that HireVue could be used to perpetuate biases that exist in society, such as biases against people of color or people with disabilities. They also argue that HireVue could be used to invade the privacy of candidates, as it collects and stores biometric data such as facial scans.

Here are some of the potential consequential impacts of HireVue:

- Increased efficiency: HireVue can help employers to interview more candidates in less time. This can save employers time and money.
- Improved candidate experience: HireVue can provide candidates with a more convenient and personalized interview experience. This can make the hiring process more enjoyable for candidates.
- Reduced bias: HireVue can help to reduce bias in the hiring process. This is because HireVue does not rely on human judgment, which can be biased.
- Increased privacy concerns: HireVue collects and stores biometric data, such as facial scans. This data could be used to track candidates' movements or to identify them.
- Potential for discrimination: HireVue could be used to discriminate against certain groups of people. For example, HireVue could be used to screen out candidates who are of a certain race or ethnicity, or who have a disability.

Algorithmic Risk Assessment (Lite)

Table 1 provides a breakdown of the risks to different stakeholders. Predictions based on facial characteristics expose the following stakeholders to a high level of risk on each of the below harms. Table 2 provides a more complete assessment that details medium and low risks to different stakeholders.

Table 1. High Risk Harms to Stakeholders

Stakeholder	Harm
Candidate	Individual employment discrimination
	Bioinformatics - consent
	Bioinformatics - training of model using data
	Data retention
Employers	Differential access to opportunity
	Vendor due diligence
Internal HireVue Decision Makers/teams	Skewed product/policy guidance for users
	Biased AI models

Stakeholder	Interest/Harm	Metric/Cause	Likelihood	Likelihood Notes	Magnitude	Magnitude (Severity (ind) x Scale (N))	Risk Level
Candidate	Individual employment discrimination	Bias	High	Very likely to happen	High	High Severity & High Scale	High
	Bioinformatics - consent	Privacy	High	Very likely to happen	High	High Severity & High Scale	High
	Bioinformatics - training of model using data	Privacy	High	Very likely to happen	High	High Severity & High Scale	High
	Data retention	Privacy	High	Very likely to happen	High	High Severity & High Scale	High
	Security breaches	Misuse	Low	good cybersecurity	High	High Severity & High Scale	Medium
	Lack of explanation of algo. details	Transparency	Medium		Low	Low severity & High Scale	Medium
	dignitary harms	Bias	Medium	moderate chance	Medium	Medium Severity & Medium Scale	Medium
Employers	Differential access to job opportunities	Bias	High	Very likely to happen	High	High Severity & High Scale	High
	stereotype reinforcement	Bias	Low	not as likely as other vars	Medium	Medium Severity & Scale	Low
	Vendor Due diligence	3rd party risk	High	Very likely to happen	High	High Severity & High Scale	High
	confirmation bias	Bias	Medium	moderate chance	Medium	Medium Severity & Scale	Medium
Internal HireVue Decision makers/teams	Skewed product/policy guidance for users	Bias	High	Very likely to happen	High	High Severity & High Scale	High
	Biased AI models	Bias	High	Very likely to happen	High	High Severity & High Scale	High

Our assessment can be found at the following link:

https://docs.google.com/spreadsheets/d/1r7IUTvnLFfY0EQqUbmTpTmlWx9LdYPAzWlS_4_SC7uc/edit?usp=sharing

Our technology and science follow the professional guidelines and regulations to maximize fairness in the hiring process and support data privacy. We also continually monitor proposed regulations and laws, so we can help provide the right guidance to our customer base.

- Uniform Guidelines on Employee Selection Procedures (UGESP)
- Equal Employment Opportunity Commission (EEOC)
- The Age Discrimination in Employment Act of 1967 (ADEA)
- Americans with Disabilities Act of 1990 (ADA)
- General Data Protection Regulation (GDPR)
- Data security
- Privacy

In designing AI-based assessments, we can minimise any data points that lead to a bias to ensure proportional outcomes for all relevant groups. For instance, if we see that a disproportionate number of men score higher than women, we can determine what behavioural measures are causing the bias and change the algorithm to remedy that score difference.

because our AI interview assessments assign weights to all words, word types, statements, and contextual phrases that are predictive of the competency being rated or measured, we can minimise any data that contributes to adverse impact with minimal impact on the accuracy of our assessments. For example if the word "aggressive" is predictive of the competency 'Drive for Results', yet more men than women use the word, it might add bias against women in the competency score. By lowering the weight assigned to the word "aggressive" the bias against women will be decreased and the prediction of the competency still remains.

4/5ths Rule' mandated by the US Equal Employment Opportunity Commission, according to which if the selection rate for a certain group is less than 4/5ths of the group with the highest selection rate, that can be considered evidence of 'adverse impact' on the group with lower scores. We perform additional checks using well-established ratio and statistical metrics for group differences (the technical terms for which include 'Cohen's d', 'Fisher's Exact', '2 Standard Deviations', and others).

- *Rely on our team of expert IO Psychologists to identify the critical competencies for each role*
- *Measure a variety of soft and technical skills accurately and objectively*
- *AI-driven, scientifically validated assessments mean the most comprehensive and accurate view of a candidate's ability to be successful*

In a video-based assessment, you'll be presented with a question – either written or in video form – and be given several minutes to respond to each question. Most video-based assessments include between five and eight questions.

Our AI assessments don't replace recruiters. They simply help recruiters and talent acquisition teams assess more candidates more quickly and more accurately. Recruiters and hiring managers are provided materials and training on what competencies are measured in the assessment and why and how to interpret the competency assessment results (we provide further detail of this below)

Common types of questions you'll see in a video-based assessment are:

- *Situational judgement questions. You'll be asked what actions you would take when confronted with a hypothetical situation.*
- *Scenario-based simulations. You'll be asked to simulate your actions in a hypothetical scenario. The key difference between this type of question and a situational judgment question is that you'll act out your response, rather than explain it.*
- *Past behavior questions. You'll be asked to relate past experiences and previous challenges you've faced.*

Your interview video will be analyzed by an assessment model (also called an algorithm).

Video-based assessments evaluate both what you know about performing the job ("hard skills" or competencies) and what recruiters call "soft" competencies, like communication skills, conscientiousness, problem-solving skills, team orientation, and initiative.

Each assessment algorithm (or model) is developed for one type of job role, and many were developed specifically for the company that is offering the job.

We've learned a lot by conducting over 32 million interviews. With this data, our models focus on skills, behaviors, and competencies specific to the job and not on irrelevant information like how someone was dressed, which university they attended, or which keywords are in their resume.

For the vast majority of jobs, the interview (and the assessment, if the hiring company uses them) help recruiters make the first cut, and then those in the top group move on to person-to-person interviews before hiring decisions are made by people.

So HireVue Interviews and Assessments are basically just replacing the typical 20-minute screening phone call with a recruiter and the long, multiple-choice question assessment tests before the top pool of candidates moves on to the person-to-person interviews. And, to answer your other question, no robots are involved – just software.

Nearly all companies who use HireVue interviews and assessments simply use this as a convenient first step in a longer process that involves person-to-person interviews with finalists later on. This step is often used to replace the screening phone call many recruiters have with candidates like you. Just as would happen if HireVue were not part of the process, if the recruiters choose to bring you past this screening step, then you're almost certain to have one or more person-to-person interviews later on.

The HireVue assessment model development process

HireVue does not offer a one-size-fits-all algorithm that evaluates all candidates for all job types in the same way. Each assessment model is purpose-built for a specific job role after following these critical steps:

- *Ensure that there is a clear performance indicator for the job role that differentiates the strongest from the least promising performers.*

- *Ask the right questions to elicit responses that can be measured and that are pertinent to predicting job performance based on IO psychology research.*

- *Train the model to notice everything that is relevant in the interview (what someone says and how they say it), and build a model that uses only the data points that help predict success in the job.*

- *Rigorously audit the algorithms to ensure that they aren't adversely impacting protected groups.*

- *Remove features that may cause biased results.*

- *Re-train the model.*

- *Re-test the model.*

- *Repeat these procedures as needed so the algorithm evolves with the customer's data and changing requirements of the job.*

When HireVue creates an assessment model or algorithm, a primary focus of the development and testing process is finding and mitigating factors that may cause bias (or "adverse impact") against protected classes. The HireVue team carefully tests for bias related to age, gender, or ethnicity throughout the process — before, during, and after development of the assessments model. Thorough testing is done prior to deployment and continues to be performed as part of an ongoing process of prevention.

Once assessments on candidates have been performed, recruiters see a list prioritized by assessment scores and can choose which to move on from the screening stage to the person-to-person interviewing stages. Skilled recruiting specialists and hiring managers decide which candidate to hire after the completion of multiple stages in the hiring process.

The models we use to assess candidates through interviews have been trained using expert human evaluations of structured interview responses; the scoring algorithms are based on sophisticated analytic techniques to craft correlational-based models that mimic trained expert human rater judgements.

To create the assessment scores for each BARS, HireVue collects thousands of expert human rater evaluations of standardised interviews and uses these ratings to train the models to score candidate interview responses.

Training

1. *We collected scoring data from interviews for different levels of roles, type of companies, and geographic locations.*
2. *We trained teams of around 30 expert raters to evaluate the responses in each of those interviews based on specific competencies according to an evaluation guide based on using a BARS.*
3. *The expert raters then manually scored each response in the interviews against each competency, with 2-3 separate evaluators scoring each candidate answer.*
4. *During the training process, we held regular calibration discussions to ensure consistency in scores from each rater. We also filtered any unreliable data (for example where there were audio issues or insufficient words in a response). We also re-scored or removed responses where rater evaluations varied significantly.*

The HireVue Assessment for your job will be evaluating your answers to questions about specific skills and competencies for that job, such as teamwork, persistence, or, for a sales job, for example, ability to negotiate.

HireVue provides each candidate with an individualised Candidate Insights Report setting out their assessment scores (see Appendix A). In addition, where the hiring company requests it to do so, HireVue can also provide further information on the underlying data in respect of each candidate.

Junkyard

Context - The context of an algorithm is the socio-technical setting within which it is deployed. It might include the process of development of the algorithm, the process of preparing the data for the training algorithm, the process of delivering an algorithm to its primary user, and often, most importantly, the setting within which it is used. The analysis of the context of the algorithm might also include the dynamics

of the algorithm's commercial trade, including whether it is open sourced or licensed. It is these contextual aspects of the algorithm's development and delivery that often account for much of the negative impacts of the algorithm.

- *What is the stated purpose of the algorithm?*
- *Who is deploying the algorithm and what is their understanding of the purpose?*
- *How are the outputs of the algorithm used?*
- *Are these actions fully automated, or is there a human-in-the-loop and how does the human intervene or facilitate the loop?*
- *Is the algorithm static, or is it updated? If updated, at what cadence?*
- *How well is the group the algorithm is applied to represented in the training data?*
- *What common socio-political harms underpin and result from human decision-making that the algorithm is augmenting or supplanting?*

In addition to the lawsuit regarding inappropriate storage of biometric data, HireVue made decisions and analyzed the candidate's tone of voice, micro expressions, word choice clustering, and eye and eyebrow expressions.

HireVue uses an algorithm to assess job applicant's qualifications based on various facial characteristics via an automated video interview platform. In addition to the lawsuit regarding inappropriate storage of biometric data, HireVue made decisions and analyzed the candidate's tone of voice, micro expressions, word choice clustering, and eye and eyebrow expressions. According to Nathan Mondragon of HireVue, used facial analysis software to capture microexpressions to use as database points that "roll together to give certain emotions and traits of personality".[8] After the interview data are captured, the AI would score the candidate for the job match.

HireVue has removed the facial analysis component from its screening assessments as concerns about the transparent and appropriate use of artificial intelligence in employment decisions and were accused of employment discrimination.

In addition, in January, 2022, The HireVue lawsuit was a class-action lawsuit that was filed in Illinois state court with allegations that the video interviewing platform violated the Illinois Biometric Information Privacy Act (BIPA) by collecting and storing biometric data from job applicants without their consent. BIPA is a state law that protects the privacy of biometric data, such as fingerprints and facial scans.

The lawsuit was filed by Kristen Deyerler, an Illinois resident who applied for a job with a company that used HireVue's video interviewing platform. Deyerler alleges that HireVue collected her biometric data, including her facial scan, without her consent. She also alleges that HireVue did not provide her with a publicly available retention policy for her biometric data, as required by BIPA.

Today, over 850 companies have used HireVue for their hiring and applicant tracking needs. According to HireVue.com, they have completed over 35 million interviews, 46 million chat conversations, 6 million assessments completed, and 90% customer satisfaction (HireVue.com, 2023).

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[1] https://youtu.be/8QEK7B9GUhM

[2] https://www.ftc.gov/sites/default/files/documents/reports/facing-facts-best-practices-common-uses-facial-recognition-technologies/121022facialtechrpt.pdf

[3] https://www.nytimes.com/2019/05/14/us/facial-recognition-ban-san-francisco.html

[4] https://www.paulhastings.com/insights/client-alerts/class-action-targeting-video-interview-technology-reminds-employers-of

[5] https://news.bloomberglaw.com/daily-labor-report/eeoc-targets-ai-based-hiring-bias-in-draft-enforcement-strategy

[6] https://www.eeoc.gov/meetings/meeting-january-31-2023-navigating-employment-discrimination-ai-and-automated-systems-new/ajunwa

[7] https://hrlens.org/wp-content/uploads/2019/11/The-Next-Generation-of-Assessments-HireVue-White-

Paper.pdf

[8] https://youtu.be/8QEK7B9GUhM

HireVue's Innovative Approach to Streamlined Hiring

In conclusion, HireVue's "Talent Experience Platform" software offers companies a valuable tool for streamlining their candidate engagement process, providing a standardized and efficient approach to hiring. By utilizing conversational AI, video interviews, assessments, and automated scheduling, HireVue caters to a wide range of organizations, from Fortune 500 companies to smaller businesses, academic institutions, and government agencies. HireVue's use of algorithms in its assessment process, incorporating both competency frameworks and facial characteristics analysis, brings an innovative dimension to candidate evaluation.

The collection of numerous data points from video interviews allows for a comprehensive assessment of candidates' cognitive abilities, personality traits, emotional intelligence, and social aptitude. This approach aims to provide recruiters with a structured and fair way to evaluate candidates quickly and cost-effectively, compared to traditional human-led interviews.

It's worth noting that HireVue maintains a stance as a data processor, emphasizing that the ultimate decision-making authority rests with the employer, who is the data controller. Furthermore, their commitment to transparency is reflected in the provision of post-assessment reports, which offer candidates insight into the specific criteria being evaluated for the position they are applying for.

In summary, HireVue's use of algorithms in the hiring process represents a promising advancement in talent assessment, offering a comprehensive and efficient means of evaluating candidates and ultimately empowering organizations to make more informed hiring decisions.