

AiME

AI for mental health and addiction



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The Industry

Challenges with Disability Insurance & Workers' Comp



Overview

The opioid epidemic costs the U.S. **\$504 billion** annually and mental health disorders cost **\$467 billion**, with depression and anxiety accounting for \$210 billion. Insurance companies incur \$26 billion of the opioid-related costs and lose \$800 million annually on fraudulent mental health claims.



The Problem

Addiction risks and mental health disorders are very **subjective** and cannot be easily proven. **Progress** of mental health improvement throughout a claim is also difficult to track. Additionally, roughly 30% of people who receive insurance continue collecting checks despite being well enough to return to work.



Current Solutions

The industry currently relies on either self-report questionnaires or mental health professionals. Both resources are limited by several factors:

1. Subjective in nature and subject to biases
2. Time-consuming to administer and score and often require multiple sources of information to generate accurate ratings
3. From a psychometric perspective, symptom-rating scales are not ideal because of vague rating systems (e.g. "mild", "moderate", and "severe" categories) that may be insensitive to subtle changes in symptom severity that occur over time

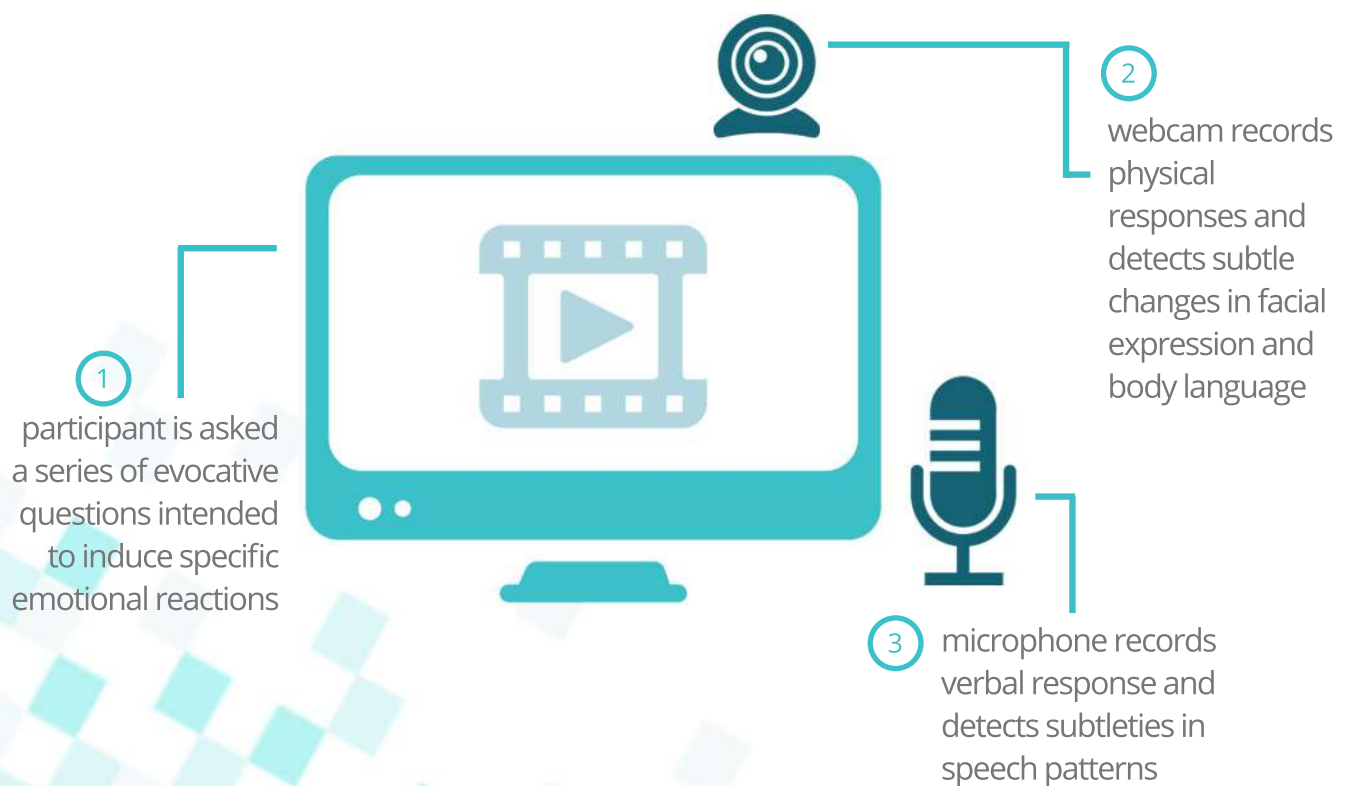
AiME

Procedural Overview

Artificial Intelligence Mental Evaluation (AiME)

AiME is a lightweight web interface for objectively evaluating mental health and opioid addiction risk.

Machine learning algorithms implemented into AiME analyze multi-modal user responses, such as speech content, facial expressivity, and vocal prosody, to objectively analyze an individual's mental health.



AiME

Novel Technology

Three Bodies of Data:



Speech Content: responses are recorded and transcribed, then fed into Natural Language Processing models; these models analyze answers against data within a large conversational corpus

Facial Expressivity: facial cues and reactions are analyzed using a multisense platform capable of detecting nonverbal behavior with high precision

Vocal Prosody: acoustic analysis detects vocal nuances (inflection, timbre, etc.)

THE PROCEDURE

DATA COLLECTION



EXTRACT subtle verbal and nonverbal responses
BUILD database of nuanced behavioral patterns over time

MACHINE LEARNING



APPLY neural network technology to observe responses
ANALYZE patterns to map various mental health risk factors

REPORTING



PRODUCE a report addressing select mental health categories
OFFER objective mechanisms to track mental health over time

Textpert is combining the use of data collection, machine learning, and standardized mental health assessments to revolutionize how we understand mental health


AiME

Standardized Reporting

results are tracked on a numeric scale in eight behavioral categories

category graphs visualize individuals' behavior with respect to the general population

participant information is collected and summarized during each AiME exam




Exam Information

Patient Name: Stacy L
Patient Birthday: 07-16-1997
Patient ID: 504682001

Exam Date: 01-25-2018
Exam Sequence #: 2


AiME Results

Depression Risk [?]




Patient is currently showing symptoms at a 26% risk of clinical depression.

Anxiety Risk [?]




Patient is currently showing symptoms at a 58% risk of clinical anxiety.

Verbal Sentiment [?]




Patient showed a predominantly neutral verbal sentiment, averaging approximately 72% neutral speech sentiment.

Eye Energy [?]




Patient showed low to moderate levels of eye energy.

Inflection Variance [?]




Patient has a lower than average vocal inflection variance; more often has monotone rather than animated speech patterns.

Mouth Mapping [?]




Patient showed a predominantly positive mouth movement, averaging approximately 90% positive mouth motion.

Eye Engagement [?]



Patient showed high levels of eye engagement.

Modality Dissonance [?]





Patient has a slightly higher than average vocal modality dissonance.

Patient Summary:

Patient showed lower risk of depression and moderate risk of anxiety. Verbal sentiment maintained an overall neutral tone, and patient showed high levels of engagement yet low levels of energy. Speech content if patient was often dissonant from verbal tone.

[View Heatmaps >>](#)

[View Transcript](#)  

participant information recorded during each AiME exam and tracked over time

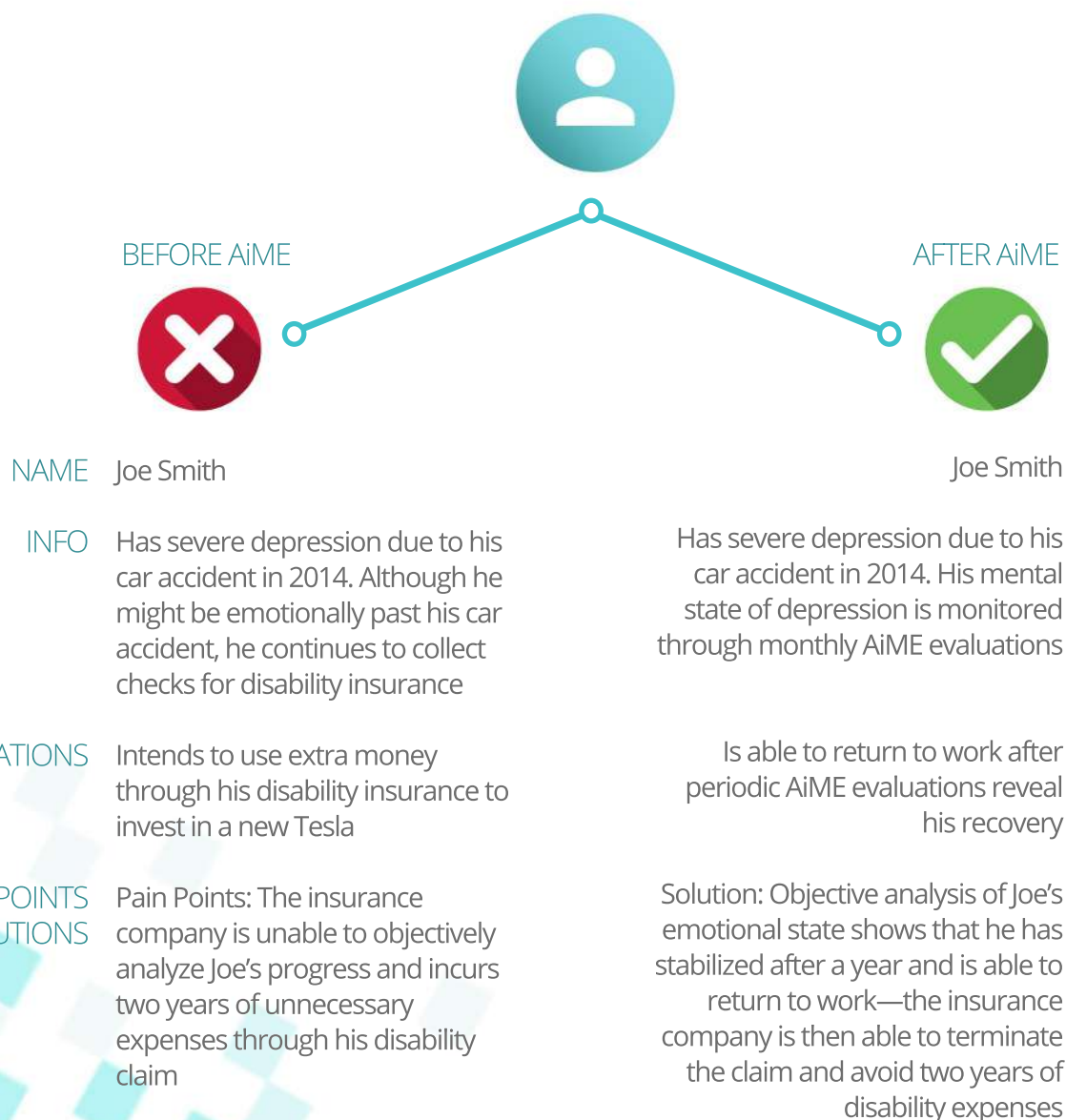
risk levels determine likelihood for common mental health conditions by combining verbal, nonverbal, and demographic data

graph explanations and significance are generated for each modality

speech transcripts as well as recorded behavior can be viewed on the following page in video and heatmap form

Cracking the Code


Use Case: Tracking Mental Health




Cracking the Code

Use Case: The Opioid Epidemic

Opioid Disorders

 Over **2.1 million** individuals are reported to have an opioid use disorder

 Opioid addiction is not very well understood and difficult to treat

 The Centers for Disease Control and Prevention (CDC) has estimated that this crisis costs insurance companies over **\$26 billion** in a single year and **\$504 billion** in total economic cost

What Happens?



Sarah injures her knee



Sarah initiates a disability claim for her knee



Sarah has surgery and begins knee rehabilitation

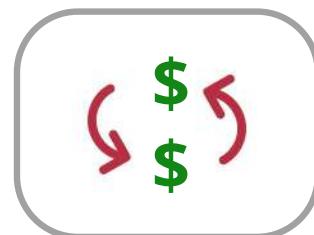
Normally Sarah would rehabilitate her knee over a predictable timeframe; however...



Sarah becomes addicted to painkillers



Sarah's knee is no longer the claim; her addiction becomes the claim



The insurance company is now at risk for a costly and indefinite claim

The addiction is catastrophic to Sarah and the insurance company is responsible for Permanent Total Disability

This could have been prevented

Cracking the Code

Predicting & Preventing Opioid Addiction

Incorporating Machine Learning



Artificial intelligence advances in both computer vision and natural language processing enable identification of individuals at higher risk of addiction



AiME uses an ensemble neural network capable of detecting subtle patterns in speech content, facial expressivity, and vocal prosody combined with additional demographic features that indicate higher risk of opioid addiction

A New Narrative



Sarah injures her knee



Sarah initiates a disability claim for her knee



Sarah takes the AiME exam and is flagged as "high risk"



An alternative treatment plan with reduced use of opioids is developed for Sarah



Sarah engages in rehab with heavily reduced (or no) use of painkillers



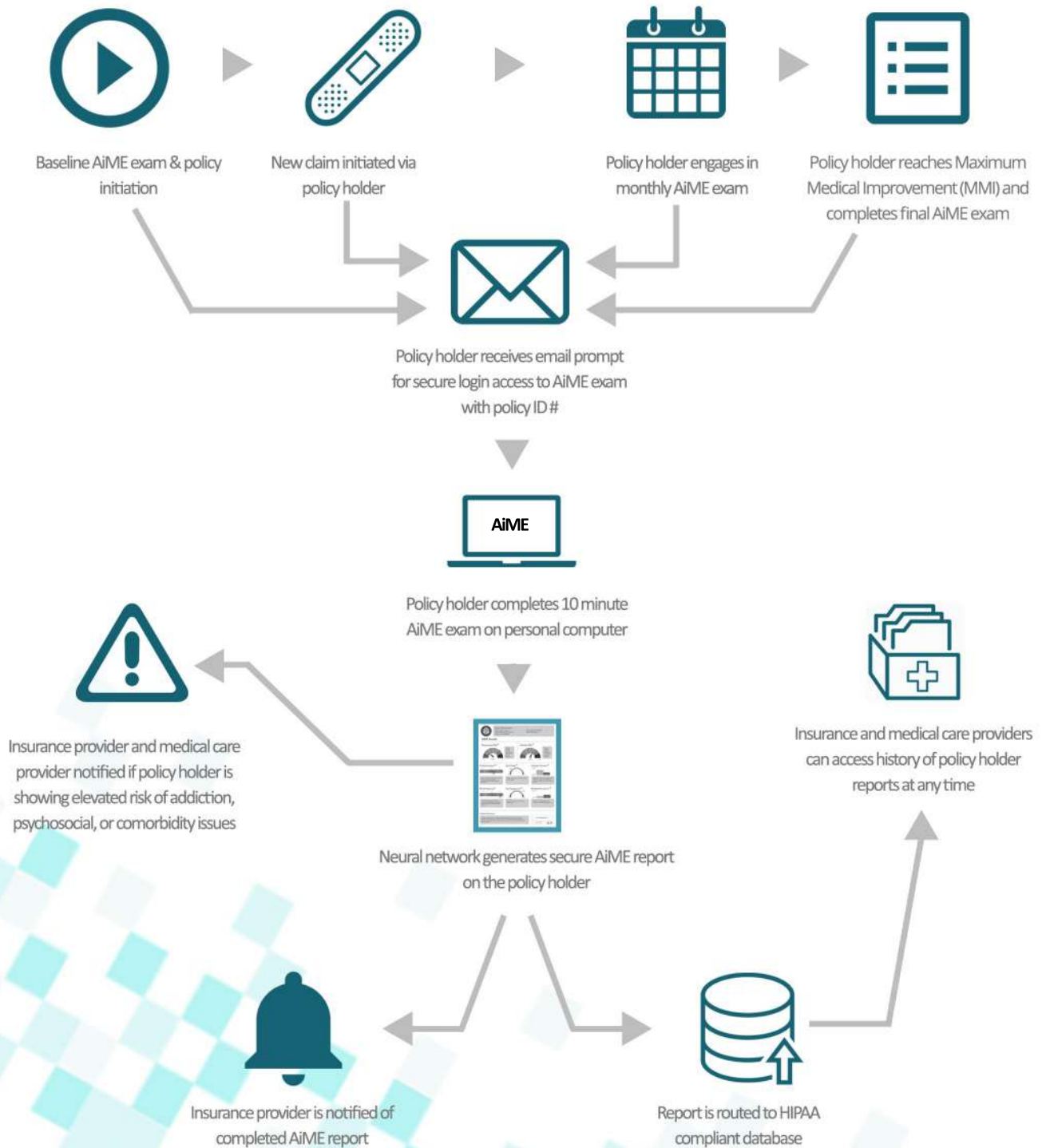
Sarah successfully rehabilitates her knee and completes the claim

AiME identifies and prevents Sarah's opioid addiction so she is able to get healthy faster. Additionally, risks related to fear avoidance, catastrophizing, and comorbid psychosocial issues are mitigated

Cutting-edge AI technology thus provides the best tool to prevent opioid addiction

Cracking the Code

Client Flow



About Us



Ray Christian, CEO
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Full-stack engineer, AI startup exit
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Awards & Achievements:

Awarded Microsoft BizSpark Grant
Awarded UCLA grant and office space
Accepted into UCLA Anderson Venture Accelerator
Featured in Mashable, Huffington Post, PC Mag, SiriusXM
Institutional Partners: UCLA, USC, UCSF
Corporate Partners: Teen Line, HelloTech, JBBBS

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