Okaya

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The Okaya Platform: An AI-based Approach to Mental Well-Being

What it is, how to use it, and the Okaya Index

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Redefining well-being intelligence

The global mental health challenge

The world is facing an unprecedented mental health landscape. Global events and new technologies have dramatically transformed human dynamics, creating complex challenges that traditional approaches to mental health have struggled to cope with. The intersection of technological change, global uncertainties, and evolving workplace expectations has made mental well-being a critical strategic imperative for organizations moving forward.

What is Okaya?

Okaya is an AI-driven technology platform that provides video check-ins on personal devices that perform real-time mental health assessments through a strict privacy-first architecture.

The platform ensures individual data remains completely private until explicitly shared, while giving organizations the aggregated insights they need to create optimal environments for team wellbeing, success, and peak performance.

Beyond traditional well-being programs

In the past, organizations often considered mental health only as a peripheral concern. Today, mental health is increasingly recognized as a core driver of both individual and organizational performance. The Okaya platform seeks to enable mental well-being in this new landscape by providing information that allows individual well-being to be monitored and, where desired, integrated into organizational goals.

While the technology has a broad scope of potential applications, it is primarily targeted to assist:

Personnel readiness	**Behavioral health support**
By identifying potential mental health challenges and fatigue patterns, the technology can be used to help organizations make better informed decisions about staffing and operations. Use cases range from first responders to Air Force pilots (as part of SBIR Phase II research).	Clinicians and support staff simply do not have the time and resources to continuously follow all patients as they progress along their mental health journeys. The technology can be used to gain nuanced and real-time insights to assist with triage and follow-up operations.

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Okaya uses non-diagnostic insights—scores and trends rather than labels—to encourage open discussions about mental health. This shifts the focus from stigma and judgment to empowerment and growth.

The Okaya approach

Okaya has created a platform that reframes mental health, turning it from a potential area of vulnerability into a cornerstone of both individual development and organizational resilience. The method draws from multiple elements, including:

- Standard, readily accessible mobile and laptop devices
- Sophisticated machine learning algorithms
- Research methodologies grounded in medical expertise
- Integrated analysis of visual, audio, and textual data

Below we explore each of the validation components in the Okaya platform and explain how they are collectively used to create the Okaya Index.

Visual assessment validation

The Okaya platform's visual assessment focuses on nuanced non-verbal cues and behavioral indicators. The system analyzes facial expressions, eye movements, and other inputs, to identify signs of emotional states, including fatigue and depression. Environmental factors, such as lighting and video quality, are also considered to ensure assessment accuracy across diverse recording conditions.

Validation of the visual component involves two complementary layers of verification.

First, a technical validation step uses a corpus of 324 videos to refine the system's capability to accurately identify and measure fundamental features such as facial landmarks (e.g., blinks) under varied conditions. Facial landmarks are 2D (x, y) coordinate locations of facial features, such as the corners of lips and eyes, points on eyebrows, irises, and face contours, and intermediate points on cheeks and forehead. This involves analyzing variables like face orientation (yaw, pitch, and roll), lighting, and background noise to make sure the algorithm consistently "sees" and "hears" the user's inputs correctly. For instance, to optimize performance across diverse scenarios, the platform examines average grayscale pixel intensity (instead of lux) to assess luminosity, along with image noise levels and frame rates.

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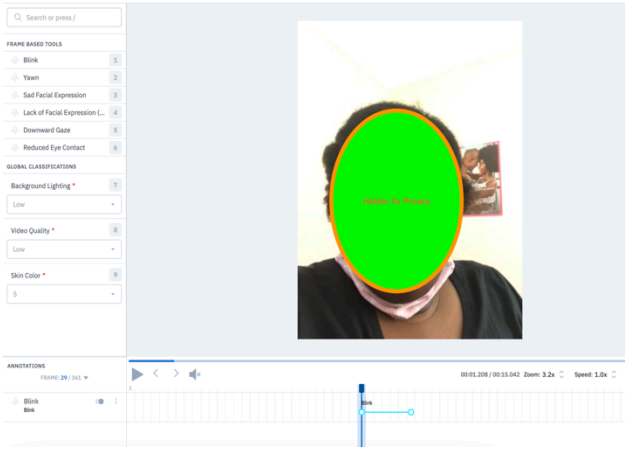
For example:

	Luminosity*	dB	FPS
Min	118.44	−90.3	0
Max	131.72	−27.30	120
Avg	125.19	−41.68	28



Second, this corpus of annotated videos is used to connect detected features to meaningful mental health and fatigue indicators. During this validation phase, careful annotation processes are employed to reduce bias and obtain a representative dataset.

Through tools like LabelBox, Okaya's team maps the extracted features to evidence-backed mental well-being markers, to ensure the algorithm not only functions correctly but produces insights aligned with known research and clinical understanding.

Audio assessment validation

Audio analysis has the capability to deeply evaluate speech characteristics, including vocal attributes such as tone, pitch, and rhythmic patterns. The platform examines (but is not limited to) the following elements:

- Vocal characteristics indicative of distress or engagement
- Prosodic feature variability
- Speech modulation as a marker of cognitive load and emotional state

Validation of the platform's audio component represents an approach equally nuanced to that of the visual component. The audio technology used in the platform is trained on a dataset of over 65 demographic groups, categorized by age, ancestry, gender, and regional dialect. For all demographic groups, F1 scores for word recognition exceed 92%, which indicates high fidelity accuracy in identifying words across all demographic groups.

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Contextual assessment validation

The linguistic analysis component examines written and transcribed speech from multiple aspects. The platform analyzes vocabulary complexity, sentence structure, and response dynamics to generate insights into cognitive and emotional states. Specific focus areas include:

- Linguistic pattern recognition
- Response speed assessment
- Cognitive processing fluency indicators

Consistency validation

An algorithm must be reliable in the output it provides. Okaya's algorithm shows consistency in two ways:

- When a video is run 100 times independently, each feature returns the same output, and the index score is the same each time.
- When a video is run 100 times consecutively to mimic a user checking in multiple times, the algorithm returns the same feature scores each time, but the index score fluctuates, as expected.

The validation process extends beyond algorithmic accuracy: it also encompasses the crucial considerations of privacy, security, and platform scalability. This holistic approach ensures that the Okaya platform provides sophisticated mental health insights and that it does so with unwavering commitment to ethical and responsible AI development.

Understanding the Okaya Index

Utilizing all the data from the various types of validation described above, Okaya creates the **Okaya Index**, a unique score that captures an individual's state of well-being over time. Instead of one-time evaluations, it tracks personal baselines and watches for meaningful shifts in a person's well-being profile. This approach ensures insights are tailored to each person's typical range, giving more accurate, context-rich information.

Current approaches to mental health assessment

In the US, mental health evaluations typically rely on standardized protocols that compare an individual's symptoms to population-based norms. These assessments are conducted in a variety of settings—clinics, hospitals, and telehealth services—with the goal of diagnosing and monitoring mental health conditions.

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Most diagnostic processes are guided by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) and the International Classification of Diseases (ICD-11). The Patient Health Questionnaire (PHQ-9) is particularly popular for screening depression due to its proven efficiency and reliability. Beyond the PHQ-9, practitioners also use tools like the Generalized Anxiety Disorder 7-item Scale (GAD-7), the Perceived Stress Scale (PSS), the Beck Depression Inventory (BDI), and the Structured Clinical Interview for DSM-5 (SCID-5) for more comprehensive evaluations.

Okaya diverges from this traditional approach by focusing on each individual's personal well-being trajectory rather than benchmarking against broad population averages.

Okaya's approach: Personalized mental wellbeing landscape

The Okaya algorithm creates a personalized distribution of an individual's collected and analyzed data points. This ensures that each assessment is uniquely tailored to the individual, meaningful deviations from their personal baseline are tracked, and all insights remain deeply personal and contextually significant.

Score categories: An individual's landscape

Category	Index Range	Percentile Range
Very Healthy	80–100	65th–99th
Sustainable	60–80	35th–65th
Moderate	45–60	20th–35th
Needs Support	0–45	0–20th

These categories are exponentially scaled to give more nuanced insights into an individual's mental well-being, with extra resolution in the lower percentiles where more support is needed.

The Okaya Index's utility stems from its ability to transform raw data inputs into a curated set of over 30 distinct features, which have been drawn from published scientific literature (see Appendix). While the index is still undergoing validation at scale, it is based on well-researched, multi-dimensional methodologies and is designed to offer reliable, evidence-driven insights.

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Planned large-scale validation

Like all AI algorithms, the Okaya Assessment Algorithm is constantly evolving. As more data is gathered, the algorithm becomes more accurate. To that end, Okaya follows an approach of running continuous research and validation exercises with targeted organizations and individuals, while conforming to the highest levels of security and compliance. These validations are done under IRB settings and standards. As of December 2024, the company's current research projects include:

- **United States Air Force, 71st Flying Wing:** Assessing fatigue and cognitive processing
- **Indiana University:** Evaluating depression and well-being indicators in cardio-oncology patients
- **Ongoing research:** Continuous improvements targeting strategic population groups, under IRB, and in collaboration with scientific advisors.

Early Comparisons of the Okaya Index with Established Tools

Comparing the Okaya Index with the PHQ-9

The PHQ-9 relies on subjective, self-reported depressive symptoms, while the Okaya Index takes a multi-modal approach, analyzing visual, audio, and textual data to assess a wider range of mental wellbeing factors—beyond just depression—such as stress, fatigue, and cognitive processing. This objective, continuous monitoring can detect nuances the PHQ-9 may miss. For example, an individual who reports moderate depression on the PHQ-9 might show elevated stress and cognitive fatigue in the Okaya Index's analysis, prompting more comprehensive care.

The platform achieved a high correlation (R^2=0.78) between its feature extraction system and PHQ-9 scores. While these initial results are encouraging, Okaya recognizes that its current data is limited to a specific population group. To broaden its understanding and ensure more representative findings, they are conducting IRB-backed studies designed to diversify their datasets and analyze individual PHQ-9 questions in greater detail.

Comparing the Okaya Index with the CFS

The Cancer Fatigue Scale (CFS) relies on subjective self-reporting to gauge physical, emotional, and cognitive aspects of cancer-related fatigue. Okaya's multi-modal approach allows the Okaya Index to identify fatigue that may extend beyond cancer-related factors and capture stress, cognitive strain, and other mental health indicators in real time. Though initial findings show a strong correlation (R^2=0.73) between their feature extraction system and CFS scores. At the moment, Okaya recognizes that the dataset is skewed toward lower fatigue

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levels. Recognizing this limitation, we are committed to conducting IRB-backed studies to diversify its data sources and explore more granular aspects of the CFS, including its physical, affective, and cognitive subscores, as well as each individual question.

Ethical, transparent, and secured AI practices

All data collected during Okaya-led studies are kept strictly confidential and used solely for research purposes. The following protocols ensure data security:

- **Data encryption and secure storage:** All data is encrypted and securely stored, with access restricted to the research team only.
- **Anonymized emails:** Participants are provided with anonymized email addresses to protect their identities.
- **Personally identifiable information (PII):** Any PII recorded during studies is securely stored and deleted at the end of the study period. It is not shared as part of the results.
- **Minimal personal information:** Participants are asked for a very limited set of PII.

The studies conducted by Okaya adhere to strict ethical standards set by both institutional and governmental regulatory bodies and have received IRB approval. All procedures involving human participants comply with the ethical principles outlined in the Declaration of Helsinki, and relevant guidelines issued by the Department of Defense (DoD) when carrying out studies involving government personnel. Additionally, the protocol conforms to the DoD Ethical Principles for AI.

Informed consent is obtained from all participants to ensure they fully understand the nature, purpose, and potential risks of the study. Confidentiality and data protection measures are rigorously maintained, including the use of anonymized emails and secure storage of audio recordings, until the conclusion of the study, at which point audio recordings are deleted.

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Privacy

The platform does not support facial identification.

It is a known and accepted fact that an individual could ask another individual to do a check-in in their stead.

Trade-offs

The model is optimized for real-time performance on a wide variety of mobile and desktop devices, but is sensitive to face position, scale, and orientation in the input image.

Inputs

Videos should be captured in “selfie” mode. The algorithm will not consider faces that are:

- Looking away from the camera (more than 80°)
- Inclined from the vertical orientation
- Only partially visible (less than 50% of the face)
- Located too far away from the camera (a cropped face cannot be rescaled to the model input of 192x192 without quality degradation)

Volume level of the audio input must be within the proper range.

Note: At the time of publication of this paper, end-users are not yet notified in real-time of these limitations.

Environment

If the environment degrades (e.g., light, noise, motion, or partially obscured face) the analysis can also degrade.

Instrumentation

Dataset images were captured on a diverse set of smartphone cameras and desktops.

All images were captured in a real-world environment, under different conditions of light, noise, and motion.

Fairness

The underlying video landmark acquisition process was developed using 1700 samples, 100 from each of the 17 geographical subregions, which were annotated with perceived gender (male and female) and skin tone (from 1 to 6) based on the Fitzpatrick scale.

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Future roadmap

Expanded well-being indicators
The platform's research trajectory is focused on developing more nuanced analytical capabilities to deepen the understanding of mental well-being. By mapping emotional states, cognitive processes, and psychological resilience, the goal is to detect subtle indicators of stress, anxiety, and cognitive performance that surpass the limitations of current assessment models. This holistic perspective moves beyond surface-level metrics toward a richer, more dynamic view of individual well-being.

Refining methods and technologies
A central priority is to enhance how the platform integrates visual, audio, and textual data streams. Strengthening these processes promotes better accuracy across diverse demographic groups and makes possible more robust, inclusive analyses.

Longitudinal insights
To better understand how mental health evolves over time, planned longitudinal studies will track well-being trajectories over extended periods. These efforts will illuminate the platform's potential to predict shifts in mental well-being and support proactive, data-driven mental health strategies that inform clinical decisions and organizational policies.

Commitment to transparency and collaboration
Upholding transparency and scientific rigor guides every stage of research. The platform's approach includes:

- Establishing collaborative research partnerships
- Submitting results to peer-reviewed scientific journals
- Incorporating systematic user feedback
- Continuously refining the Okaya Index based on emerging insights

By adhering to these principles and refining its methodologies, the platform aims to advance the field of mental health assessment beyond traditional diagnostic frameworks. While the outlook is promising, lasting success will depend on rigorous validation, adherence to ethical standards, and demonstrable impact across varied populations.

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Summary

The Okaya platform represents a transformative approach to mental health monitoring. It utilizes advanced AI technologies to create personalized, non-diagnostic well-being assessments across diverse environments. By integrating machine learning, multi-modal data analysis, and medically informed research methodologies, Okaya is developing the Okaya Index—a comprehensive, individualized mental well-being tracking tool that goes beyond traditional diagnostic frameworks. The platform's commitment to ethical AI practices, continuous improvement, and scientific validation positions it as a pioneering solution for understanding and supporting mental well-being in complex, dynamic settings.

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