TECH OFFER

AI Smart Spectacles - Cognitive and Emotional Analysis for Mental Health Management

KEY INFORMATION

TECHNOLOGY CATEGORY:
Sustainability - Sustainable Living
Healthcare - Telehealth, Medical Software & Imaging

TECHNOLOGY READINESS LEVEL (TRL): TRL9
COUNTRY: CHINA
ID NUMBER: TO175327

OVERVIEW

The AI-Enhanced Smart Spectacles integrate camera-based eye tracking, photoplethysmography (PPG) sensors, and electroencephalography (EEG) sensors into a lightweight and comfortable spectacle frame. This multi-modal data collection system enables real-time monitoring of eye movement, brain activity, and heart rate, offering deep insights into a user's cognitive state, stress levels, and overall neurological health.

Using AI-driven analytics, the system can detect early signs of stress-related vision problems, cognitive fatigue, and mental health disorders, providing preventive interventions before symptoms manifest. A key focus is helping teenagers avoid vision fatigue and prevent anxiety and depression by offering early detection and proactive recommendations.

In addition, it offers a multi-model approach with a **health assessment machine**, a stationary diagnostic unit designed for in-depth cognitive and emotional health evaluations. This machine leverages AI-driven analytics to integrate facial expression recognition, pulse waveform analysis, eye movement tracking, and neural activity assessment, offering high-precision mental and

neurological health diagnostics. It serves as an advanced assessment tool in clinics, schools, and corporate wellness programs, allowing detailed stress profiling and personalized intervention recommendations.

This non-invasive, wearable AI solution is designed for healthcare, education, and corporate wellness applications, ensuring continuous well-being monitoring for users in their daily lives. The technology owner is looking for potential licensing and use-case collaborations in Singapore.

TECHNOLOGY FEATURES & SPECIFICATIONS

Smart Spectacles: AI-Integrated Stress & Vision Health Monitoring

- Sensor-Embedded Spectacle Frame – EEG sensors, eye-tracking cameras, and PPG sensors are discreetly placed on the spectacles, collecting real-time physiological data from the ear-side region for accurate brain activity, heart rate, and eye movement analysis.
- AI-Powered Cognitive & Emotional Analytics – Detects stress-induced vision fatigue, cognitive overload, and mental health risks. Provides early warnings and intervention strategies for teen vision health, anxiety prevention, and workplace stress reduction.
- Seamless Wearability & Cloud Connectivity – Lightweight, ergonomic design for all-day wear, with secure wireless data synchronization to wellness and productivity platforms.

Multi-Modal Health Assessment Machine: AI-Based Cognitive & Stress Evaluation

- Advanced Multi-Sensor Data Collection – Combines facial expression recognition, pulse waveform analysis, neural activity assessment, and gaze tracking for comprehensive stress and cognitive health diagnostics.
- Deep AI-Driven Analytics – Processes multi-modal inputs to generate detailed emotional and cognitive state reports, helping healthcare professionals, educators, and employers detect early signs of anxiety, burnout, and cognitive fatigue.
- Clinical-Grade Accuracy – Designed for hospitals, mental health clinics, educational institutions, and corporate wellness programs, offering data-backed intervention strategies before stress-related health problems worsen.

POTENTIAL APPLICATIONS

Healthcare & Mental Wellness:

- Supports psychiatrists, psychologists, and optometrists in detecting stress-induced cognitive and vision impairments. Offers preventive interventions for anxiety, depression, and vision fatigue.

Teen Vision & Mental Health Protection:

- Smart spectacles help students monitor screen-induced vision strain and AI-guided interventions prevent mental stress-related disorders.
- The multi-modal machine enables schools and mental health professionals to perform deeper evaluations and early interventions.

Corporate & Workplace Productivity:

- Wearable smart glasses allow employees to track cognitive load, stress levels, and eye fatigue, while the assessment machine provides comprehensive stress risk analysis.

- Helps HR teams enhance workplace wellness strategies to reduce burnout and improve productivity.

Education & Learning Enhancement:

- Real-time cognitive load monitoring supports personalized learning strategies, reducing exam stress and digital fatigue.

UNIQUE VALUE PROPOSITION

- Most Seamlessly Integrated AI-Powered Smart Spectacles for Stress and Cognitive Health Monitoring – Unlike existing smart glasses with bulky external sensors, this technology miniaturizes EEG, PPG, and eye-tracking sensors into a lightweight and ergonomic spectacle frame, providing continuous real-time monitoring without discomfort.
- Discreet, Everyday Wearability – Unlike traditional brain-computer interfaces (BCIs) or head-mounted EEG devices that require scalp electrodes or intrusive hardware, this system looks and feels like regular eyewear, making it ideal for long-term, non-intrusive health tracking in real-world settings.
- Advanced AI-Driven Cognitive & Emotional Health Analytics – Uses deep-learning algorithms to analyze brain activity, stress responses, and vision strain, offering personalized recommendations for early intervention against vision fatigue, anxiety, and cognitive overload.
- Holistic Multi-Sensor Data Fusion – Unlike other smart glasses that focus only on eye tracking or basic biometric signals, this system integrates brainwave monitoring (EEG), cardiovascular stress tracking (PPG), and gaze analysis (camera-based eye tracking) to provide a comprehensive view of cognitive and emotional well-being.
- Designed for Everyday Use Across Multiple Applications – Seamlessly integrates into healthcare, workplace wellness programs, education, and personal health monitoring, offering real-time stress reduction strategies, cognitive load assessment, and vision health tracking.