

VigilSense: AI Protecting Women's Occupational Health and Safety

A Portable EEG Fatigue Monitoring Solution Based on AI

Table of Contents

01 Challenges Faced by Women's Occupational Health

02 Our Focus Groups

03 The Solution: The Birth of VigilSense

04 Project Implementation and Results

05 Project Impact and Sustainability

06 Future Outlook

The Predicament of the 'Male Standard'

Occupational safety and health management has long been centered on male standards, leading to a systematic underestimation of risks for women.

Personal Protective Equipment (PPE) is designed based on male body types, forcing women to wear ill-fitting gear, which not only causes discomfort but also increases the risk of slips, trips, falls, and exposure to hazardous substances.



Female workers are forced to use inappropriate male-sized protective equipment.

Core point: **Breaking away from the single-dimensional "male standard" and establishing gender-differentiated occupational safety standards is the crucial first step in ensuring the occupational health of women.**

The Neglected Physiological Needs

Existing safety systems almost entirely overlook the unique physiological needs of women. The interaction between heat stress and protective equipment is crucial. Studies show that women's risk of heat stress varies significantly during different physiological stages such as menstruation and pregnancy. However, current PPE designs have never considered these critical factors.



Unprotected female workers are very common.

Funding Crisis and Institutional Backlash

Women's safety protection globally is facing an unprecedented funding crisis. Access to basic safety services for female workers is shrinking, and in some countries, there is a growing backlash against women's rights. Essential services such as shelters, legal aid, psychological support, and healthcare are being scaled back or shut down due to budget cuts, seriously undermining decades of progress in protecting women's safety and rights.



The institutional framework is like a complex set of gears. Even a slight loosening at one point can trigger a chain reaction.

Groups in Need of Attention





Frontline Female Workers in High-Risk Industries

Including women working in energy and power (e.g., power grid inspectors), industrial manufacturing (e.g., factory operators), transportation (e.g., long-distance drivers, subway drivers), and construction (e.g., female construction workers).

Women Workers in Special Physiological Stages

Refers to female workers who continue to work on the frontline during critical physiological periods such as pregnancy, lactation, menstruation, and menopause, and face higher health and safety risks.





A Solution Born from Personal Experience

Frontline Inspector's Experience

Professor Li Jieshan previously worked as a power grid inspector, experiencing firsthand the challenges of high-risk work environments. She deeply understands how ill-fitting protective equipment increases accident risks and has personally witnessed how the physiological needs of women workers—particularly menstrual cycles and heat stress—have long been overlooked. These valuable frontline experiences directly inspired her to develop VigilSense, a portable EEG fatigue monitoring device designed specifically for women.



VigilSense - Portable Electroencephalogram Monitoring Device

VigilSense: Tailored for Women



Extremely Lightweight

Only29.5 gramsand less than 13mm thick, can be easily worn inside a safety helmet.

Cost-Effective

Priced at only$110, breaking the high-cost barrier of traditional EEG devices.

Data Privacy Protection

Adopts "uninterrupted wearing" and "authorized" data collection modes, fully respecting women's data privacy and informed consent.

Wide Applicability

Suitable for multiple high-risk industries such as energy, power, and industrial manufacturing.

Multi-Party Collaboration to Build a Complete Ecosystem

Strategic Planning

We collaborated with professional consulting firms to conduct global market research, providing strategic guidance for the product's overseas promotion, localization adaptation, and partner network construction.

Team Composition

The project is led by women, establishing a full-chain closed loop of "R&D - Design - Application", with female members accounting for more than one-third. Team members include product designers, scenario designers, AI algorithm engineers, data analysts, and product trial engineers, ensuring that every link from concept to implementation fully considers women's needs.

Collaborative Innovation · Strategic Leadership · People-Oriented

Efficient Resource Allocation Model

Funding

Project funding comes from annual research grants from research institutes and pilot funds for safe production within the power grid, ensuring the smooth progress of core R&D and on-site deployment.

Human Resources

6 core members cover the entire chain of hardware, AI, scenarios, user experience, and data analysis. Meanwhile, relying on 14 frontline part-time safety officers/team leaders for data collection, no new full-time positions are needed.

Pilot Implementation

6 pilot units opened up real operational sites, contributing 130,000 EEG data points and 38 hours of real scene data to the project, improving the algorithm accuracy by 12%.

Remarkable Practical Results

Pilot Program Implementation

6 pilot enterprise

VigilSense was successfully included in the power grid's "Smart Safety Tools" pilot program, receiving on-site deployment funding support from 6 pilot units.

Efficient Team Collaboration

14 teams

14 teams participated in the pilot, and part-time staff could assist in data collection after 10 minutes of rapid training without adding new full-time positions.

Data-Driven Optimization

12% Improvement in accuracy

The project has accumulated 130,000 EEG data points and 38 hours of real scene data, improving the algorithm accuracy by 12%.

Deep integration of technology and business, through low-cost and efficient collaboration, verifies the reliability and value of the system in real and complex scenarios.

A Shift from 'Ignored' to 'Seen'



Focusing on Women's Safety for the First Time

VigilSense is the first to incorporate women's safety into core design, ending the history of women being forced to take risks due to ill-fitting equipment.

Responding to Physiological Needs

The device can dynamically identify fluctuations in fatigue thresholds caused by women's physiological cycles and issue warnings at critical moments when risks accumulate.

Guarantees for Sustainable Development

Financial Sustainability

Low-cost design ($110) ensures broad market demand, and a diversified profit model reduces reliance on a single source of funding.

Technological Sustainability

Compact modular design seamlessly integrates with existing safety helmets, with an extremely low technology adoption threshold. Continuously collected brainwave data creates long-term value for brain science research.

Organizational Sustainability

Relying on strong industry expertise and research capabilities, cooperating with pilot enterprises, and establishing a structured user feedback mechanism to ensure continuous product improvement.

Social and Environmental Sustainability

Directly promotes women's health and safety, drives the popularization of EGG AI model, and strict data privacy protection measures comply with ethical norms.

Going Global to Protect Every Woman

Our next step is to actively seek to establish deep partnerships with global industry partners and widely apply the VigilSense technology to female safety protection in high-risk industries. Through cooperation with multinational companies, industry leaders, and international organizations, we plan to integrate the device into existing safety management systems to provide real-time fatigue monitoring and proactive warning protection for female workers worldwide. We believe that technology has no borders and safety should be shared. Our ultimate goal is to fundamentally reduce industrial accidents caused by fatigue and physiological discomfort among women through continuous technological iteration and global collaboration, and enhance the safety of women in the workplace.



THANK YOU

Commitment to the occupational health and safety of women

豆包AI生成