TECH OFFER

Non-invasive Blood Glucose Evaluation And Monitoring Technology

KEY INFORMATION

TECHNOLOGY CATEGORY:
Healthcare - Medical Devices
Healthcare - Telehealth, Medical Software & Imaging

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**
COUNTRY: **SINGAPORE**
ID NUMBER: **TO175467**

OVERVIEW

Maintaining stable blood glucose levels is central to achieving a healthier lifestyle and preventing metabolic disorders such as diabetes. Even for non-diabetic individuals, daily fluctuations in glucose can affect energy levels, focus, sleep quality, and long-term metabolic health. As awareness grows around personalized health tracking, consumers are increasingly seeking simple, non-invasive ways to understand how diet, exercise, and stress influence their glucose patterns.

BGEM meets this need through a smartphone app that estimates blood glucose levels non-invasively using data from smartwatches, fitness trackers, and smart rings. By leveraging the photoplethysmography (PPG) sensors that users already wear, the app provides on-demand insights into glucose fluctuations without the need for finger pricks or patches.

Powered by advanced algorithms in the cloud, the system translates wearable sensor data into personalized glucose trend information, allowing users to visualize how daily habits influence their metabolic responses. This empowers individuals to make informed lifestyle adjustments, supporting better nutrition choices, improved fitness outcomes, and early awareness of potential

glucose irregularities.

Unlike conventional continuous glucose monitors that rely on invasive sensors, this technology is completely non-invasive, affordable, and accessible, making proactive glucose monitoring possible for a broader health-conscious population. This solution is designed for consumers who want to take greater control of their wellness journey through meaningful, data-driven insights.

The technology owner is seeking collaborations with hardware manufacturers for integration, wearable brands for product development, distributors and IHLs for expanding research.

TECHNOLOGY FEATURES & SPECIFICATIONS

The BGEM technology is an end-to-end managed AI platform that leverages Photoplethysmography (PPG) enabled wearable sensors to monitor various tissue biophotonic and hemodynamic features associated with blood glucose fluctuation. The solution comprises the following features:

- Optimised and validated AI algorithm
- Mobile Demo App
    - Including UI/UX design guideline
    - User-friendly visualisations
- SaaS
    - Scalability
    - Security
    - API Integration

POTENTIAL APPLICATIONS

The BGEM technology offers a cost-effective, non-invasive approach to estimating an individual's blood glucose levels. The applications include:

- Empowering Consumers with Personalised Insights: The technology leverages the high growth rate of smart wearables and hearables, presenting an opportunity to offer consumers a holistic view of one's wellbeing towards leading a healthier lifestyle.
- Relieving Diabetic Patients from Painful Monitoring: By enabling regular, cost-free estimation of blood glucose changes, the technology empowers individuals with Type II diabetes to monitor their glucose levels comfortably and painlessly — freeing them from the discomfort of frequent finger pricks.

MARKET TRENDS & OPPORTUNITIES

The Diabetes Burden (2024–2025)

- As of 2024, approximately 589 million adults (aged 20–79) worldwide are living with diabetes.
- Projections indicate this number could reach 853 million by 2050 if current trends continue (IDF).
- Over 80% of people with diabetes live in low- and middle-income countries (IDF).
- Diabetes-related healthcare costs reached USD 966 billion globally in 2021 — a 316% increase over 15 years.

The Rise of Wearable Technology

- The wearable health devices market was valued at approximately USD 44.06 billion in 2024 and is projected to grow at around 11% CAGR, reaching USD 112 billion by 2033.
- The wearable diabetes devices segment is estimated at USD 12.1 billion in 2025, with forecasts of USD 19.5 billion by 2030 (CAGR >10%).
- The broader wearable technology market is valued at USD 84.2 billion in 2024, expected to reach USD 186.1 billion by 2030, growing at around 13.6% CAGR.

Growing Use of CGMs Among Healthy Individuals

- Over 1 million healthy individuals now use CGMs to monitor glucose for lifestyle and performance insights.
- Adoption among athletes and health enthusiasts is rapidly increasing, with expanding interest from the general wellness market.

UNIQUE VALUE PROPOSITION

Current blood glucose monitoring technologies typically rely on finger pricks for blood extraction or the insertion of sensors beneath the skin, causing discomfort and inconvenience from wearing adhesive patches for extended periods. Moreover, the high upfront and recurring consumable costs — including sensors, needles, and test strips — continue to limit widespread adoption.

Blood Glucose Estimation and Monitoring (BGEM) technology offers a truly non-invasive alternative that can be seamlessly deployed on billions of existing wearable devices already owned by consumers. By eliminating the need for disposable equipment, needles, or test strips, BGEM makes glucose monitoring significantly more convenient, affordable, and accessible than traditional invasive solutions.

UVP of BGEM:

- **Market-Ready:** A non-invasive, SaaS-based AI solution that leverages consumer-grade wearables to provide on-demand blood glucose estimation.
- **High Performance:** Demonstrates strong analytical precision and clinical accuracy.
- **Cloud-Based:** Built on a secure, scalable cloud platform for seamless data processing and integration.
- **Third-Party Compatible:** Easily integrates with a wide range of existing wearable devices and mobile applications.
- **Sustainable:** Reduces biomedical waste by eliminating the need for disposable needles, test strips, and sensor patches.
- **User-Friendly:** Completely non-invasive, convenient, and designed for frequent, comfortable monitoring.