TECH OFFER

Non-invasive Blood Glucose Evaluation And Monitoring (BGEM) Technology For Diabetic Risk Assessment

KEY INFORMATION

TECHNOLOGY CATEGORY:
Infocomm - Artificial Intelligence
Healthcare - Diagnostics

TECHNOLOGY READINESS LEVEL (TRL): TRL9
COUNTRY: SINGAPORE
ID NUMBER: TO174743

OVERVIEW

The latest Singapore National Population Health Survey has reported a concerning diabetes trend. From 2019-2020, 9.5% of the adults had diabetes, slightly dropping to 8.5% from 2021-2022. About 1 in 12 (8.5%) of residents aged 18 to 74 were diagnosed, with an age-standardised prevalence of 6.8% after accounting for population ageing. Among the diabetes patients, close to 1 in every 5 (18.8%) had undiagnosed diabetes, and 61.3% did not meet glucose control targets. Prediabetes is also prevalent, with 35% progressing to type 2 diabetes within eight years without lifestyle changes.

Untreated Type 2 diabetes can lead to severe health issues. Tackling this challenge requires a holistic approach, focusing on awareness, early diagnosis, and lifestyle adjustments for diabetes and prediabetes. Recognising the need for innovation to address this, the technology owner develops a cost-effective and non-invasive AI-powered solution, Blood Glucose Evaluation And Monitoring (BGEM), that detects glucose dysregulation in individuals to monitor and evaluate diabetic risks.

BGEM allows users to track their blood glucose levels regularly, identify any adverse trends and patterns, and adopt early intervention and lifestyle changes to prevent or delay the onset of diabetes. Clinically validated in 2022, with a research paper published in October 2023, the technology is open for licensing to senior care/home care providers, telehealth platforms, health wearables companies, and more.

TECHNOLOGY FEATURES & SPECIFICATIONS

The BGEM technology is an end-to-end managed AI platform that leverages Photoplethysmography (PPG) enabled wearable sensors to monitor various heart rate variability (HRV) 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 predicting an individual's diabetes risk. The applications include:

- Population Health Perspective: The technology leverages the high growth rate of smart wearables and hearables, presenting an opportunity to identify undiagnosed diabetes individuals within the population.
- Preventive Health Monitoring: With the ability to monitor blood glucose changes regularly at minimal cost, the technology empowers high-risk users to adopt a healthier lifestyle and, therefore, prevent or delay the onset of diabetes.

MARKET TRENDS & OPPORTUNITIES

Diabetes around the world in 2021:

- 537 million adults (20-79 years) are living with diabetes, 1 in 10. This number is predicted to rise to 643 million by 2030 and 783 million by 2045.
- Over 3 in 4 adults with diabetes live in low- and middle-income countries.
- Diabetes is responsible for 6.7 million deaths in 2021 - 1 every 5 seconds.
- Diabetes caused at least USD 966 billion dollars in health expenditure – a 316% increase over the last 15 years.
- 541 million adults have Impaired Glucose Tolerance (IGT), which places them at high risk of type 2 diabetes.

Overview of the wearable technology market:

- The market is projected to expand at a compound annual growth rate (CAGR) of approximately 12.5% between 2023 to 2030.
- Estimated to be worth USD 55.5 billion in 2022, with a projected revenue of USD 142.4 billion by 2030.

UNIQUE VALUE PROPOSITION

Current blood glucose monitoring technologies either require finger pricking for blood extraction or the insertion of sensors into the skin and discomfort through wearing patches for extended periods. Instead, the technology uses external sensors and algorithms to detect and predict diabetes risk. No object needs to be inserted into the user's body or continuously worn throughout the day, resulting in minimal pain and discomfort. Additionally, the only equipment required for testing is the wearable device. No additional disposable equipment needles or test strips are needed, which makes blood glucose monitoring much more convenient and cost-effective than other "State-of-the-Art" solutions.

The Unique Value Proposition of BGEM include:

- Market-ready: It is a market-ready non-invasive diabetes risk detection and prediction AI solution that leverages consumer-grade wearables to detect blood glucose dysregulation.
- Performance: Demonstrates outstanding prediction and detection capabilities.
- Cloud-based: Operates on a cloud-based platform for seamless integration.
- Third-party compatibility: Easily implemented with third-party devices and apps.
- Sustainability: Reduction in bio-medical waste such as needles, test strips etc
- User-friendly: Non-invasive, convenient and allows frequent measurement.