# Vastmindz

"Making healthcare more accessible for all through remote, non-invasive diagnostic technology powered by AI"

Product/Service Summary

Using computer vision technology and advanced signal processing techniques, we extract the vital signs of any individual, including real-time heart rate, oxygen saturation levels, mental stress levels and more, through the exclusive use of a video feed that captures their face.

RGB SIGNAL ANALYSIS

PPG WAVEFORM

LIGHT

SKIN
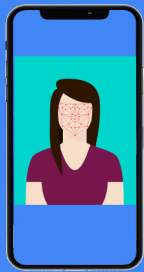
FACE TRACKING & ROI SELECTION
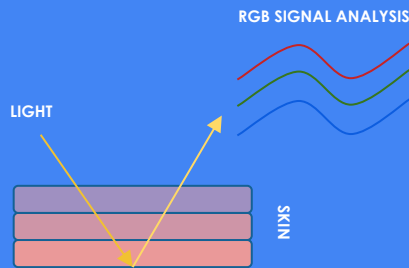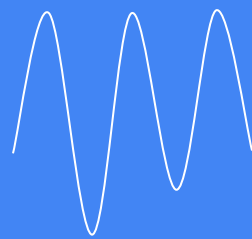
Real-time values for:

- - **Heart Rate**
- - **Heart Rate Variability (HRV)**
- - **Oxygen Saturation Levels**
- - **Respiration Rate**
- - **Mental Stress Levels**
- - **Core Body Temperature**
- - **Blood Pressure**
    and more...

Where can our solution be used?

On any device with an embedded camera. We take, as an input, a video feed of an individual's face before running computer vision techniques for facial landmark detection and proprietary signal processing for PPG waveform analysis to extract vital signs after ~300 frames has passed.

68 bpm

14 rpm

38°C

and more...
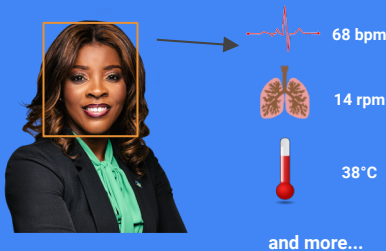
Our Technology

We use proprietary signal processing and computer vision techniques to leverage remote photoplethysmography technology (rPPG). rPPG allows for the uninterrupted control of human heart activity by detecting pulse color changes in human skin using a multi-wave RGB camera - such pulse colour changes are encoded within the changes in pixel values of a video feed.

Using facial landmark detection and normalizing for motion, illumination and other noisy signals, we can accurately track key regions on an individual's face that exhibit high signal-to-noise (SNR) ratios from which we extract a clean PPG waveform that relate to the necessary vitals that we'd like to measure.

Our solution can be compiled as an SDK and white-labelled. We also build customized branded platforms for clients that can leverage the full-use of our technology.

Easy to Use.
Precise.
Easily Deployable.
Highly Scalable.

What is the mean error level of our solution?
0.5 BPM

Our solution is currently benchmarked against the NIRP dataset, containing source videos of subjects and their ground truth heart rate values measured from regulated contact-based sensors.
(detailed reference files showcasing our accuracy can be provided upon request)

We will also be conducting further trials on a larger sample size to validate that our accuracy holds across a diverse range of individuals with various ethnicities and age ranges.

For more information, please contact
management@vastmindz.com

Product Roadmap (2020-21)

Heart Rate Variability, Oxygen Saturation, Respiration Rate, Blood Pressure

Blood Glucose levels

Q2

Q4

Q3

Q1 (2021)

Core Body Temperature

mTBI assessment

Fighting COVID-19 & other Pandemics

Patients with COVID-19 deterioration experience symptoms such as a fever, cough, shortness of break and others, all of which can be quantitatively measured through physiological signs. Via a combination of measuring heart rate, heart rate variability, respiration rate, oxygen saturation levels and core body temperature through a smartphone camera, we will be able to efficiently screen for the virus before other symptoms are exhibited. The sooner these markers associated with COVID-19 deterioration are identified, the sooner healthcare providers can treat and prevent severe medical issues.

Our software is deployed on consumer smartphones, within teleconsultation applications, in airport security and other areas - whereby the use of a video camera is prevalent - and is able to track the vitals from multiple faces in a camera frame. This would significantly enhance current methods of screening for infection and preclude the need for additional hardware devices.

OUR STORY

We are a team of data scientists, software developers and entrepreneurs that are committed to using artificial intelligence to benefit our healthcare ecosystem. With the growing adoption of advanced smartphones, fitness trackers and other digital devices, there will be an increasing need to leverage such devices for enhanced diagnostic purposes. We see the future of humanity as immersed in an augmented paradigm, where machines will significantly increase the productivity and capability of humans by identifying causal features that were previously unseen to humans.

OUR MISSION

Become the world's leading non-invasive diagnostic company and make healthcare more accessible for all through non-invasive easy-to-use diagnostic technology.

OUR VISION

The democratization of personalized health and wellness knowledge.

For more information, please contact management@vastmindz.com

OUR TEAM

Nikhil Sehgal
CEO

Nikhil co-founded Vastmindz following an algorithmic trading background to apply his data science & AI skills for social good. Nikhil is a certified IBM Data Science & Machine Learning Professional and holds data science certifications from DeepLearning.ai

Raj Sharma
CTO & Chief Data Scientist

Raj has experience working with big tech players such as Google, Microsoft and Yahoo and has 20+ years of experience in AI research & software engineering. Raj also lectures and is a guest speaker for AI at Oxford University

Dr Claire Button
CBO

Dr Claire co-founded Vastmindz with 10+ years of experience in building health-tech ventures in the research, diagnostic and data fields and is involved with many initiatives to support entrepreneurship. Claire holds a PhD in Immunopharmacology

Rajinder Kumar
CMO

Rajinder is a highly-regarded medical officer and has published as well as presented clinical and scientific research on a global scale. He has held senior positions within GSK, Dr Reddy's Labs and currently is the CEO of MeRad Pharmaceutical LTD

Radouane Oudrhiri
Board Member

Rad is an experienced data scientist and a successful entrepreneur. Rad is also a member of the ISO Technical committee where he co-authored the Lean & Six Sigma Standard (ISO 18404) and is the CTO of Eagle Genomics

Cathy Prescott
Board Advisor

Cathy has a proven track record as a biotech entrepreneur and has worked with some of the largest life and health re-insurers globally, including Swiss Re

Peter Buckman
Board Advisor

Peter currently leads professional services for Medidata Solutions and has been with the firm for over 12 years. He has extensive experience dealing with some of the largest Pharma companies globally