




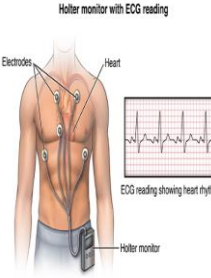




World First Automatic Vital Sign Extraction Algorithm (API/SDK) by Analyzing Human Eye using RGB camera

www.sdcor.net



SMART DIAGNOSIS

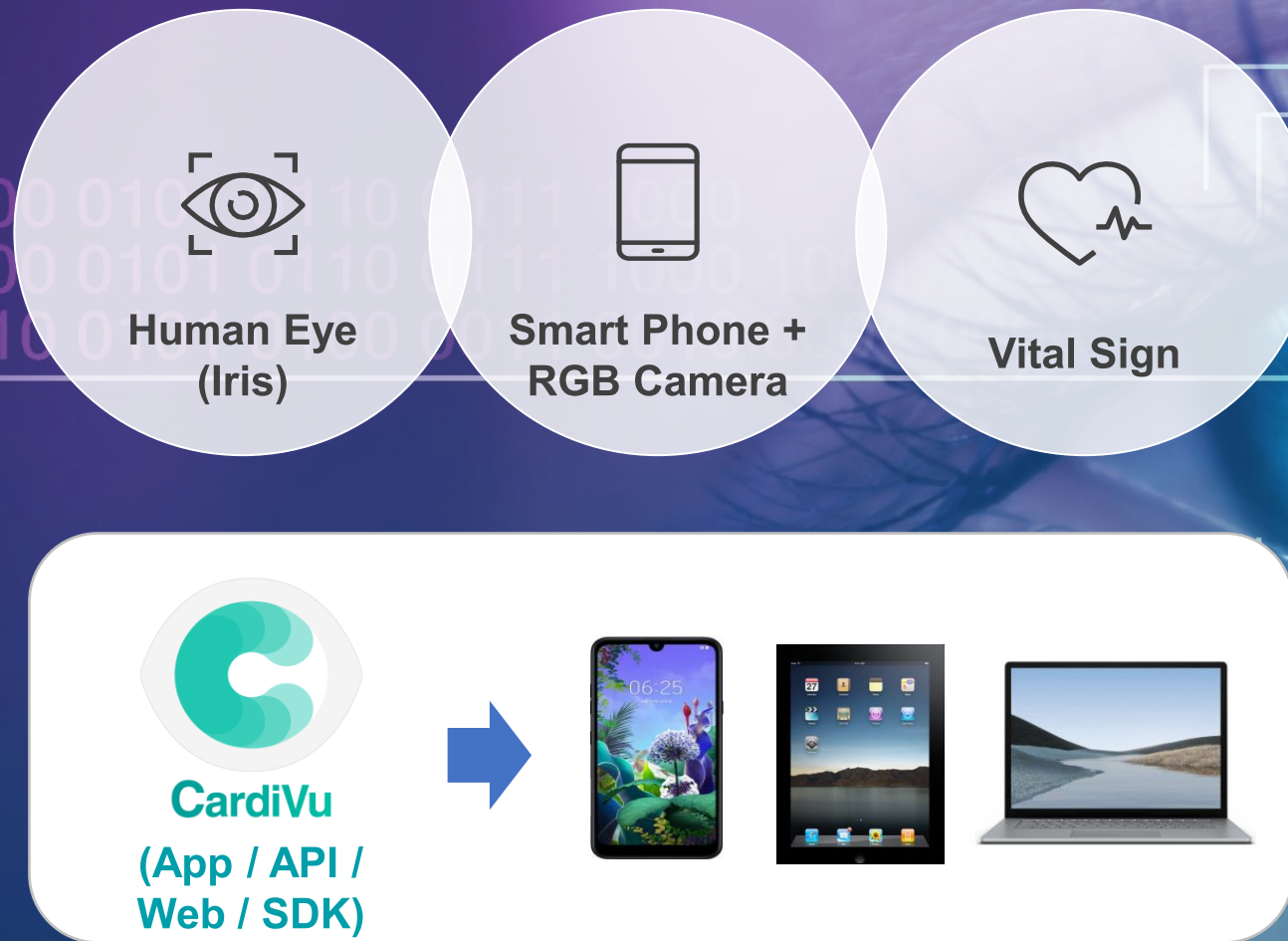
Due to COVID-19, the need for telemedicine increase rapidly. Vital sign is crucial for telemedicine but requires extra devices

Criteria	Electrocardiogram	Holter Monitor	Apple Watch4	AliveCor	CorSense	Oura Ring
FDA Approval	CVD and others	CVD and others	Arrhythmia	Arrhythmia, Tachycardia, Bradycardia	None	None
Expandability	Very Low	Very Low	Medium	Low	Low	Low
Product Images						

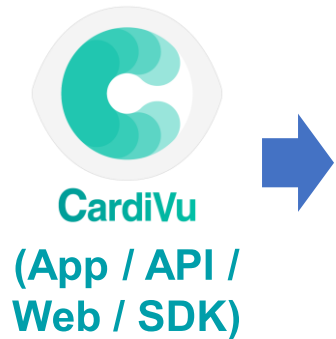
Requires

- purchase
- setup
- charge
- change of habits
- user attention

Without using any extra device, we get vital sign from normal RGB camera devices such as smartphone, tablet and laptop, etc.



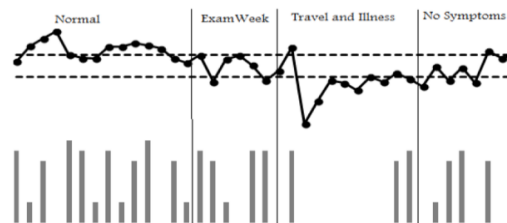
Unlike current products, our solution is contactless and running in the background for ease of use



Daily use of smartphone,
Notebook, Tablet,
PC+Webcam



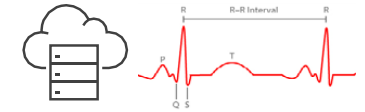
Automatic
recording of Iris
(only size variation,
not image or video)



Service to Healthcare
Platform (B2B)



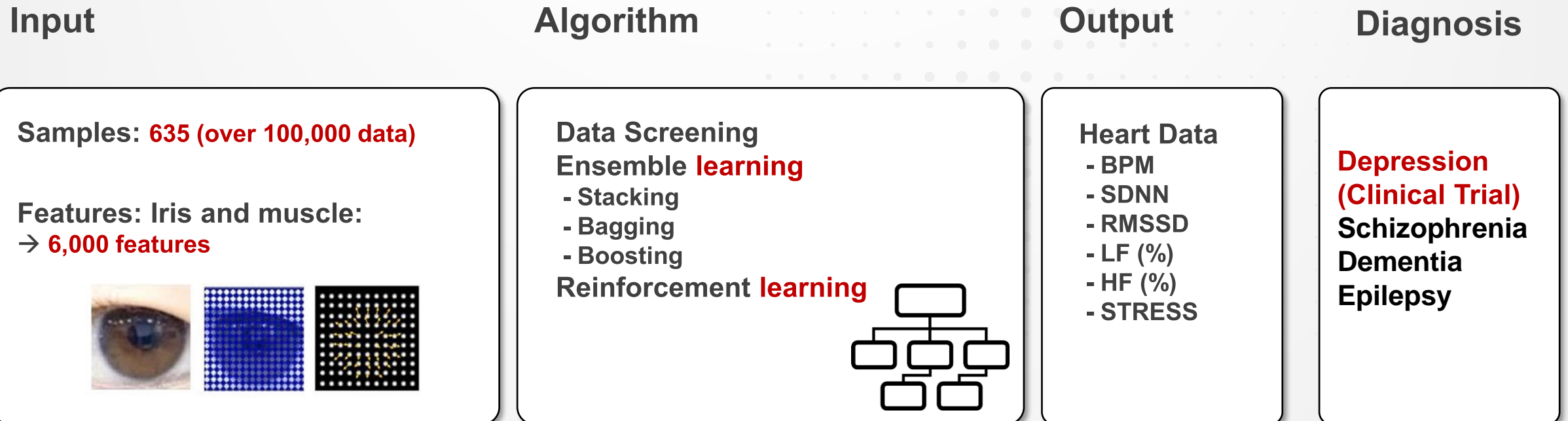
Users (Free)



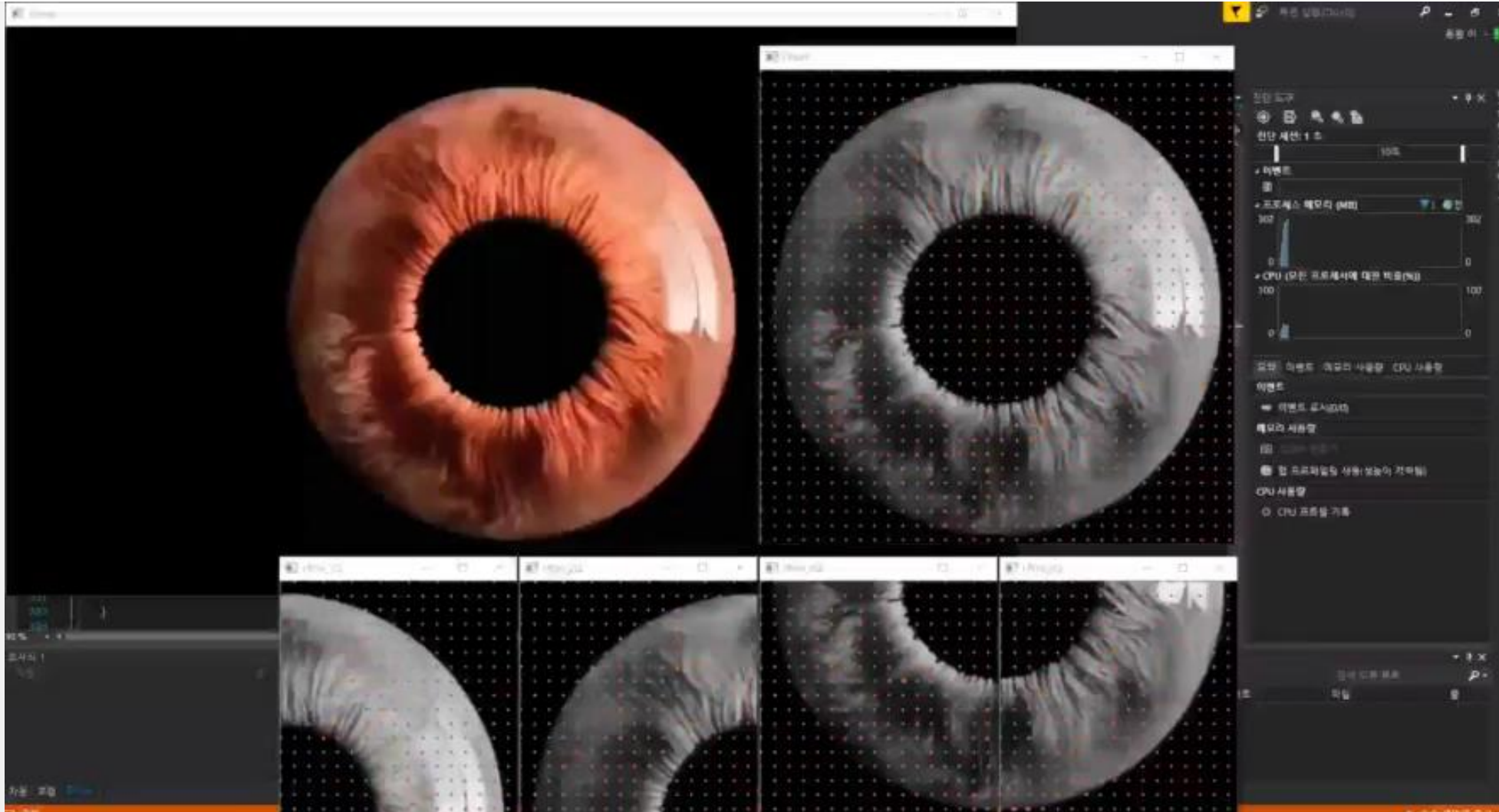
AWS Cloud server
(HRV extraction)

SD AI algorithm (6,000 feature on eye) to extract heart information

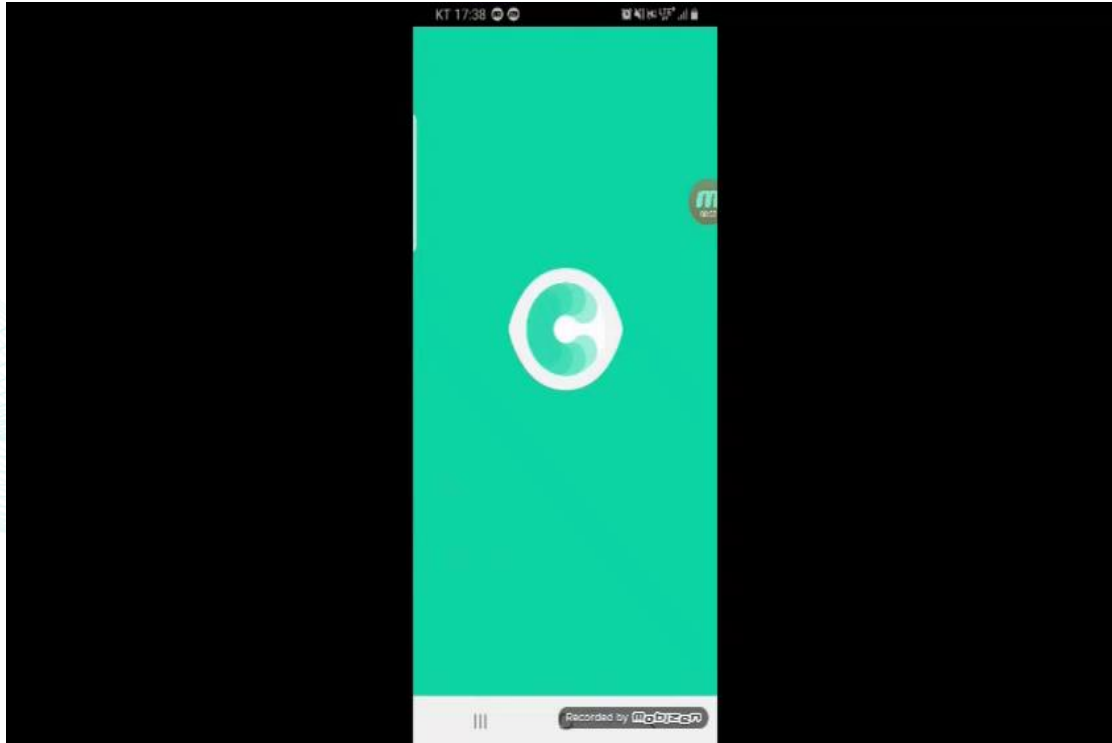
Accuracy Improved: 19.03' (80%) → 19.12' (91%) → 20.11' (93%) → **20.12' (95%)**



Analysis of Iris Muscle using Deep Learning

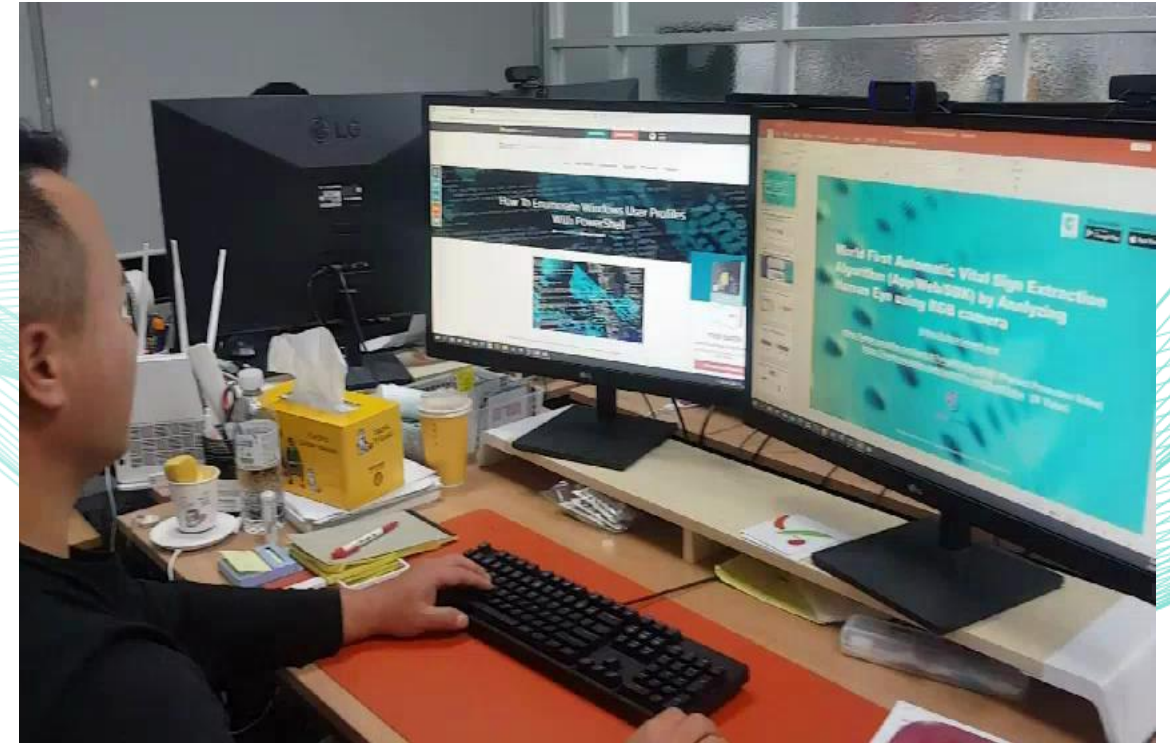


CardiVu™ (Demo Video for App/Web)



CardiVu App version

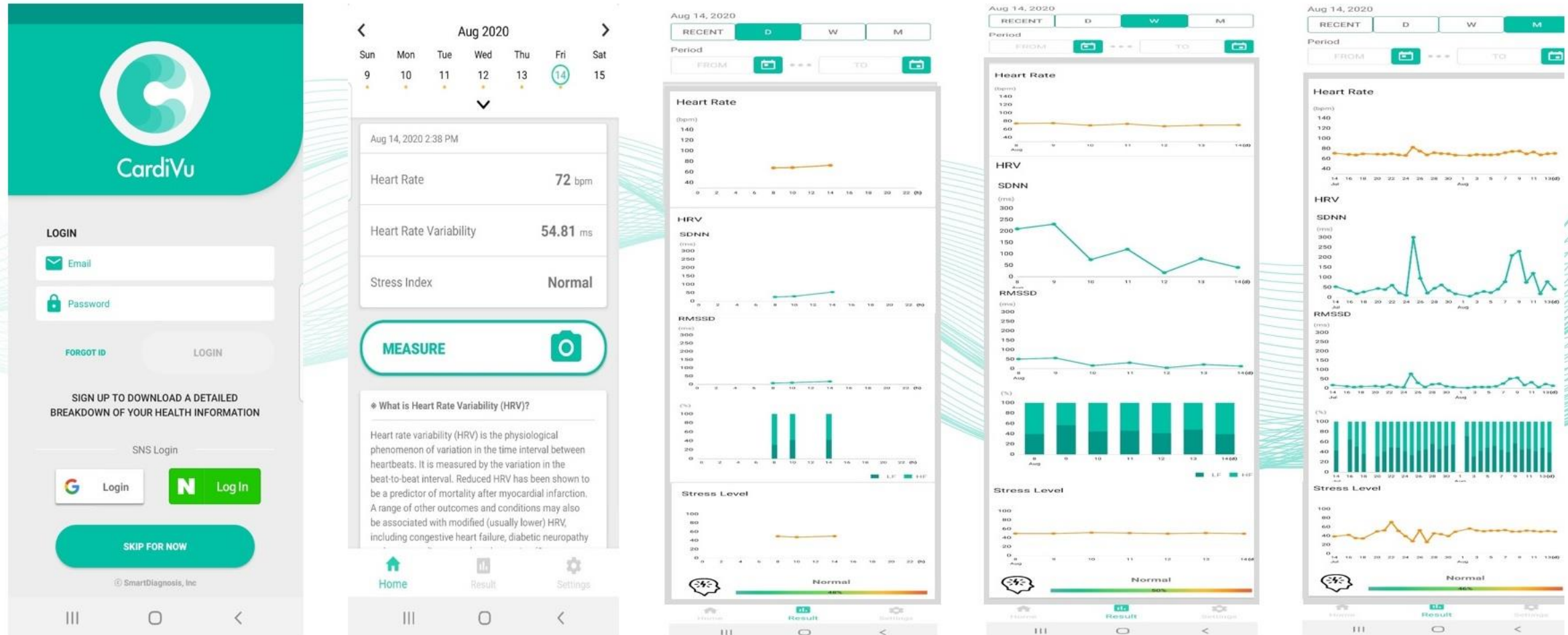
<https://www.youtube.com/watch?v=nhsbdQj2YUw>



CardiVu PC version

<https://www.youtube.com/watch?v=64oedjDK2rg>

While using smart devices (smartphone, tablet, laptop, etc), vital sign (normally 5~10) are gathered and stored in our cloud (AWS) server



Stress Measurement Report

Iris Analysis

Stress Measurement Report

Period Sep 1, 2020 ~ Nov 1, 2020

Name: Hwan Jin Kim Sex: Male Age 46

01. Stress Analysis

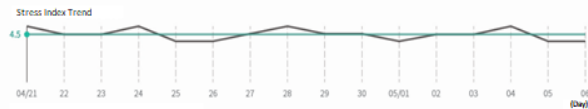
Hwan Jin Kim's average stress index is 4.5 (very high) from Sep 1 ~ Nov 1 and 15% increasing trend during this period

Low Normal **Very High**

Avg: 4.5 score

Stress Index	Score	Implication
Very High	5.0	It's progressing to chronic stress. Expert consultation is required.
High	3.0	Your tolerance is weakening through temporary stress.
Low	2.0	This is an initial state of stress.
Very Low	1.0	It's in good condition with little stress.

1: Very Low, 5: Very High



The autonomic nervous system is a control system that acts largely unconsciously and regulates bodily functions, such as the heart rate, digestion, respiratory rate, pupillary response, urination, and sexual arousal. This system is the primary mechanism in control of the fight-or-flight response. Modern people live in a stressful environment, so there are various reasons for abnormalities in the autonomic nervous system, which can accumulate and reduce immunity and cause diseases. In the following cases, you should question whether the balance between the sympathetic and parasympathetic nerves is broken.

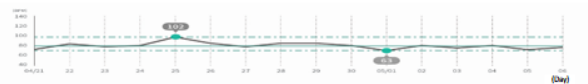
- Difficulty of digestion or feeling of bloated gas often
- The hands, feet, and face are cooler and the body is always tired
- Can't sleep well at night
- Attention and concentration are reduced, so mistakes are frequent
- Feeling of headache often
- I feel annoyed often and feel depressed or nervous for no reason

02. HR Analysis

Low **Normal** Very High

Stress Index	HRV	Implication
Very High	Over 120	It's progressing to chronic stress. Expert consultation is required.
High	100 ~ 120	Your tolerance is weakening through temporary stress.
Normal	80 ~ 100	Your stress level is maintained in normal state.
Low	Under 80	Your stress level is low but you have too low heart rate.

BPM: Beat Per Minute



- Your average heart rate is 68, which is normal

Iris Analysis

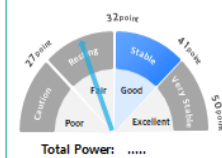
Stress Measurement Report

Period Sep 1, 2020 ~ Nov 1, 2020

Name: Hwan Jin Kim Sex: Male Age 46

02. HRV (Heart Rate Variability) Analysis

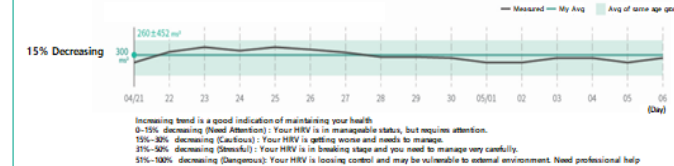
Your heart rate variability (total power) is 30 point which is low.



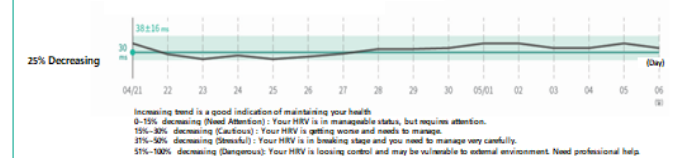
HRV Analysis?

The body's ability and emotional stability are controlled by the autonomic nervous system. The autonomic nerve is largely divided into the sympathetic and the parasympathetic nerve. The balance of these two nerves are important. Those who complain of symptoms such as depression, anxiety disorder, and burnout have a consistently lower parasympathetic (stable) tone than sympathetic (arousal) tone. It is very important to restore the unbalanced heart rate variability index of the sympathetic and parasympathetic nerves to make it at a balanced level.

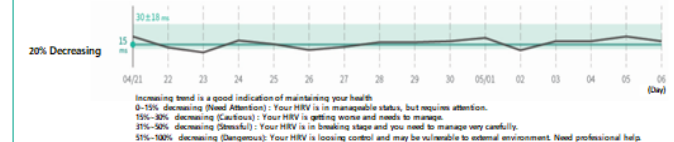
HF (High Frequency: Parasympathetic Nerve)



SDNN (The ability of the autonomic nervous system to control the body)



RMSSD (An indicator of the ability to regulate the parasympathetic nerve and the stress resistance in the body)



Our Solution

- Automatic stress measurement while using smart devices



Current Partners

- Korea EAP Assoc.
- Winners' JM, Inc.
- EasyWell, Inc.

Our algorithm is under KFDA approval as a medical software



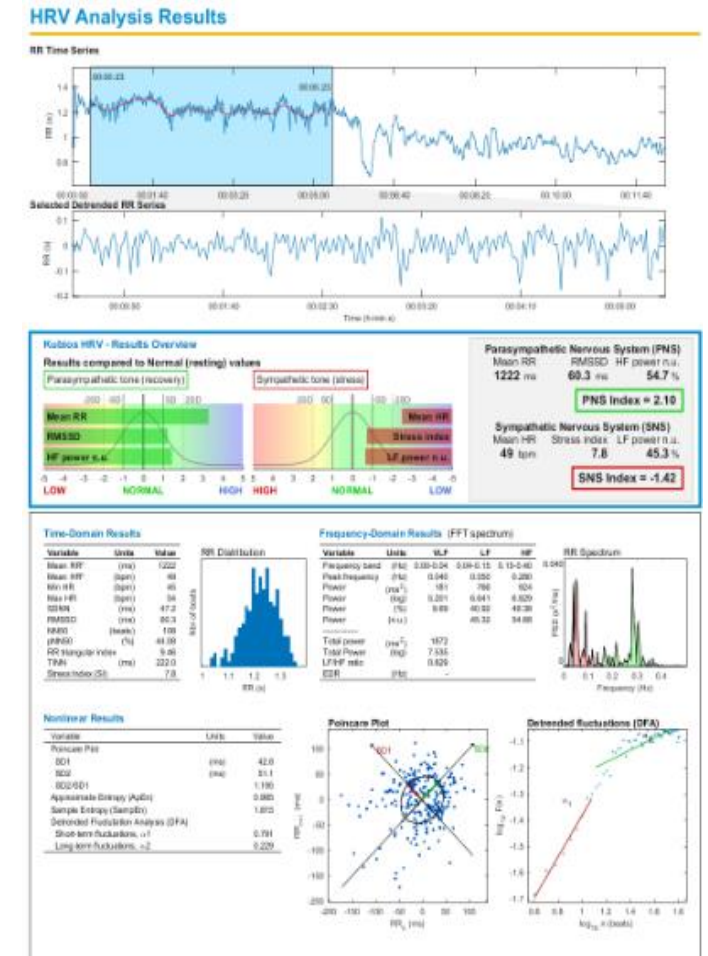
KGMP Certificate (Nov, 2020)



GL: 248 subjects over 90% acc.

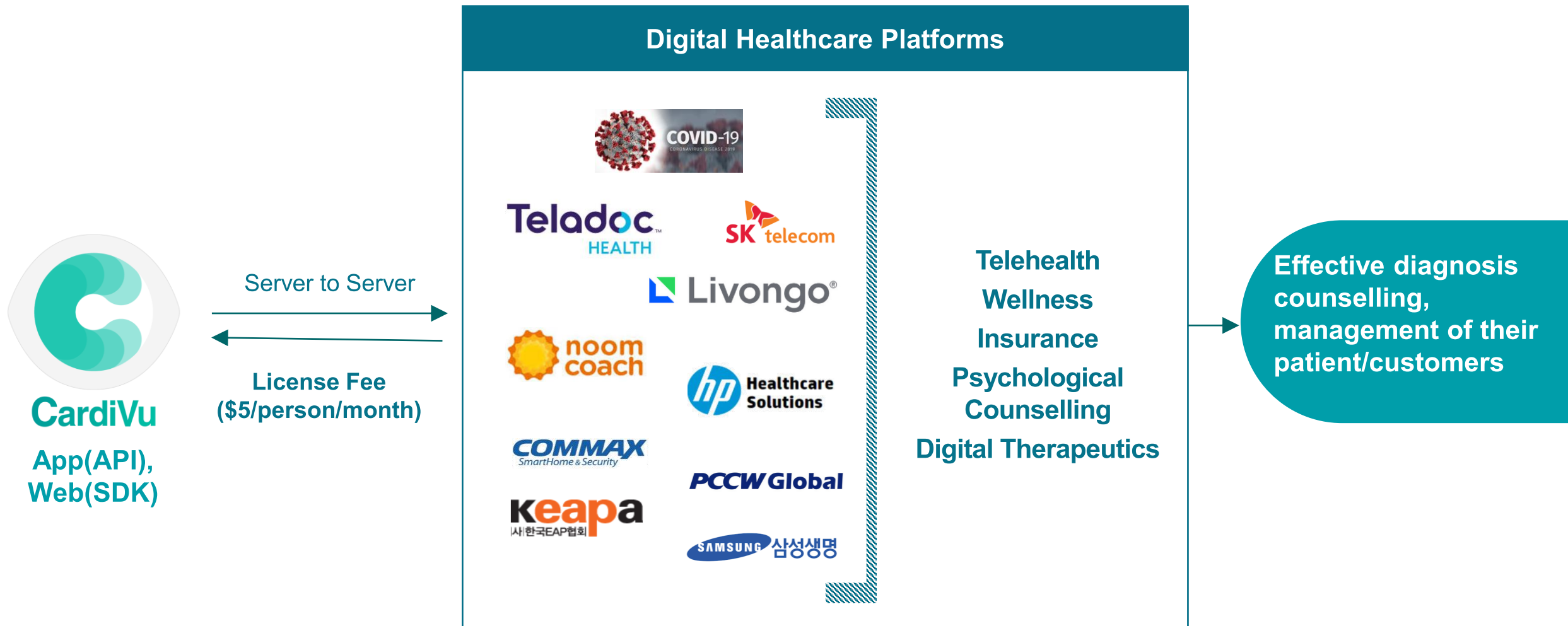


Clinical Trial for KFDA Approval (2Q, 2021)



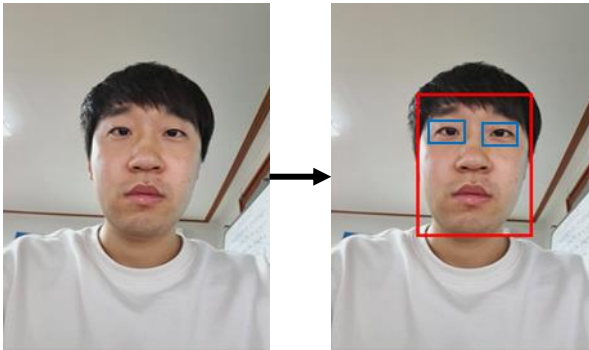
After KFDA Approval (Exp. 3Q, 2021)

Our business model is to provide vital sign to digital healthcare platforms with monthly subscription fee



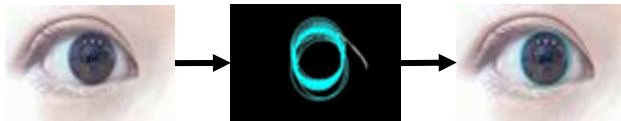
We provide gaze tracking solution (CardiVu-G) for e-learning platforms to analyze learning flow

① ROI (face, eye) detection



Smart Phone Front Camera

② Gaze tracking



Using RGB camera to tracking eye

③ Learning flow analysis

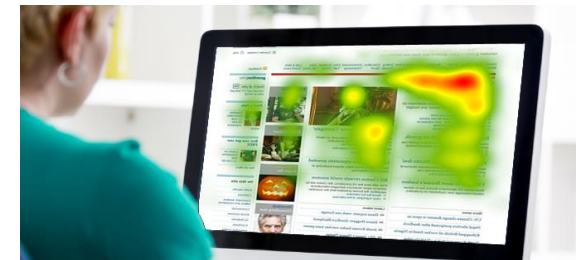


Focus X

Focus O

Focus X

👉 **Learning Flow: Length of Focused Time / Total Time**





Now Available



Available on Apr, 2020



THANK YOU

CEO : Hwan Jin (Max) Kim, PhD

#806, SME DMC Tower, Sang Am, Mapo-Gu, Seoul, S.
Korea

TEL : 82.2.395.0327 / FAX : 82.2.395.0325 /

Mobile : 82.10.2105.0522

Email : maxkim@sdcor.net



SMART DIAGNOSIS