

For low vision aid and eye care

Mobile-based Vision measurement and eye care solution

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Why you need Vivid Vision Film and NENoon more than ever

Health issues in vision

Health Chosun pick 2020.09.08 Naver News

Why does Covid-19 put eye health at risk?

Especially, due to the Covid-19 pandemic, people tend to stay indoors for a long time which could lead to the natural increase in the amount of screen time such as smartphone and TV. This is likely to cause various complications such as headache, low vision, and Keratitis.

Mediafine 3 days ago

Remote learning continues due to the Covid-19 pandemic, people need to be wary of dry eye disease

With the end of the Covid-19 pandemic nowhere in sight, major universities nationwide set curriculum centered on online learning... If left unchecked, it would result in inflammation and low vision in many...

Ajounews 2018.12.04

An eye patch and a toric lens are necessary to improve learning efficiency

Davidhi Optical to open "mom's class with master of study"... expect to improve readability and focus using contact lens
Journalist Lee Jeong Soo leejs@ajunews.com
On the 27th of last month in Coex SM Town...

Donga Page A23 Column 1 2021.01.21. Naver News

"I would like to teach my children online even if the pandemic ends"

Decreased vision was a problem. Getting addicted to videos and games using smart devices was another problem. However, since there is no alternative to remote learning during the pandemic, everyone...

Herald POP 2011.02.16. Naver News

In the era of digitalization... presbyopia surgery doubled in 4 years

Presbyopia decreases focus and readability and it comes with headache and dizziness which disrupts one's entire life. EYELOVE EYE CLINIC, a hospital specialized in LASIK and Presbyopia surgery ...

Herald POP 2011.02.16. Naver News

[Book Village] The ability to focus is also "kind of muscle"... if not used, the ability declines

And emphasizes how important focus is for leaders. He says, "we are familiar with devices more than ever..." As a psychologist, based on scientific evidence and concepts such as experiments and research...

KBS 2017.11.29. Naver News

[KBS Empathy debate] 'A surge in the number of traffic accidents caused by the elderly, is there any countermeasure?'

Ultimately, the problem was focus. Focus and fatigue are more important and another problem is... eventually this is about increasing the letter size or readability...

Sunday News 2021.02.08.

Are you distancing yourself from digital devices? In lockdown due to Covid-19, our "eyes" are in danger

Due to the Covid-19 pandemic, an increased amount of time spent is spent at home for many people. Therefore, more and more people are suffering from depression, obesity, lack of exercise. And the recent trend is "decreased vision..."

The biggest inconvenience of low vision

I don't want
to look older
than I am

I don't want
to look older

I don't want to
get up close
when looking at
my smartphone screen

I don't want
to be
up close
when I'm
talking



The biggest inconvenience of low vision

Staring at my
smartphone
screen
hurts my eyes!

I don't want
to look older

54 person in his 50s thinks his biological age is 39.6

Your first
glasses are
focus adjustable
eyeglasses?

Downsides of multi-focus glasses : headache, dizziness

I don't want to
get eyestrain
when looking at
my smartphone
screen!



Digital eyecare

To adults with Presbyopia

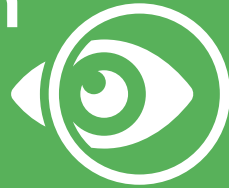
From children in physical development



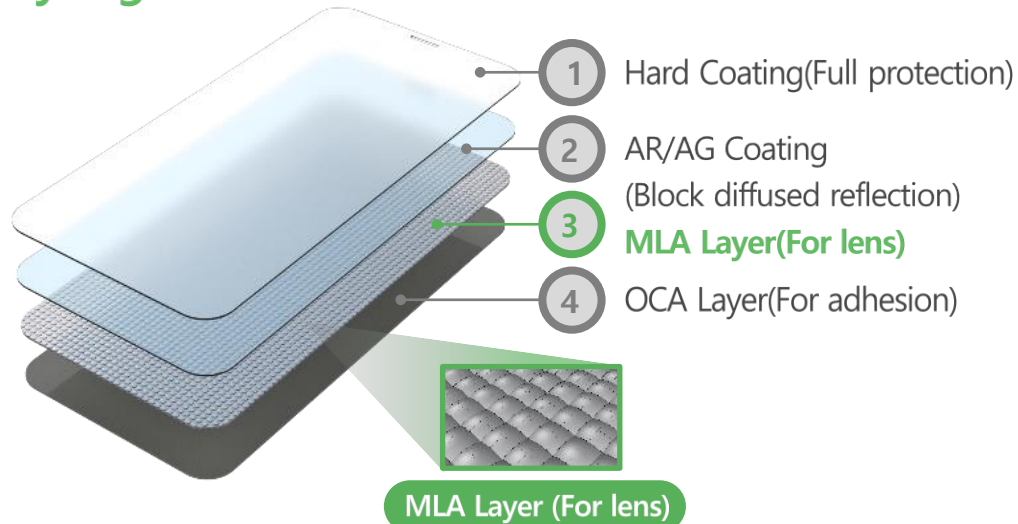
A vision correction film and a vision measurement service solution

Eyesight correction film

- Lens array that create a virtual image
- Smartphone protection



The structure of eyesight correction film



Eyesight measurement and service solution

- Re-processing the eyesight correction screen
- Acquisition of information on the user's eye health and connection to other services
- Eye exercise based on interaction

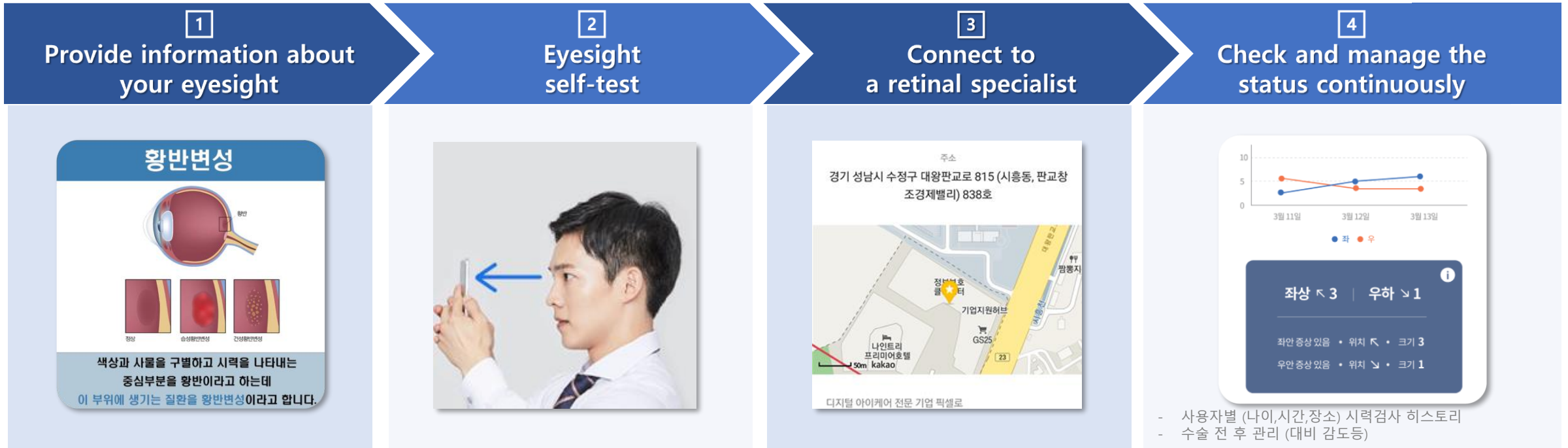


Mobile-based eyesight measurement and eye exercise



- 1 Re-processing the user's screen (Image Processing)
- 2 Collecting and analyzing data on the user's eyesight
- 3 **Linked to AI-based eyesight measurement and eye exercise services (Ophthalmology/ Opticians recommendation services)**

Mobile-based vision measurement application



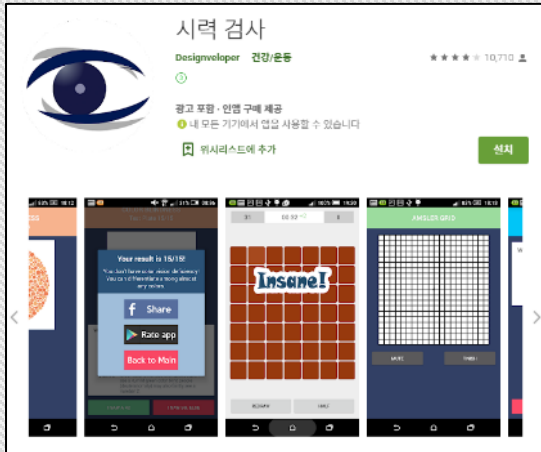
Inform family members of the risk of eye disease and connect to a specialist quickly 🏠

- 1) To raise awareness of the importance of eyesight management
- 2) To provide information on how to interpret the test results
- 3) It is not to replace professional tests, but to motivate people to undergo tests

Mobile-based vision measurement application

▶ Other companies ◀

Individual **measurement cannot be checked**, but **an image listing** one-off test is available



(Play Store: Eye test app)

▶ pixelRo (NENoon app) ◀

Provide correct **self-test measurements through algorithms** and **manage eyes with the help of experts**



(Play Store: NENoon app)

Using patented distance measurement + eye recognition technology, it improves the accuracy of self-test, provides information about your eyes continuously, and helps connect to an individual expert.

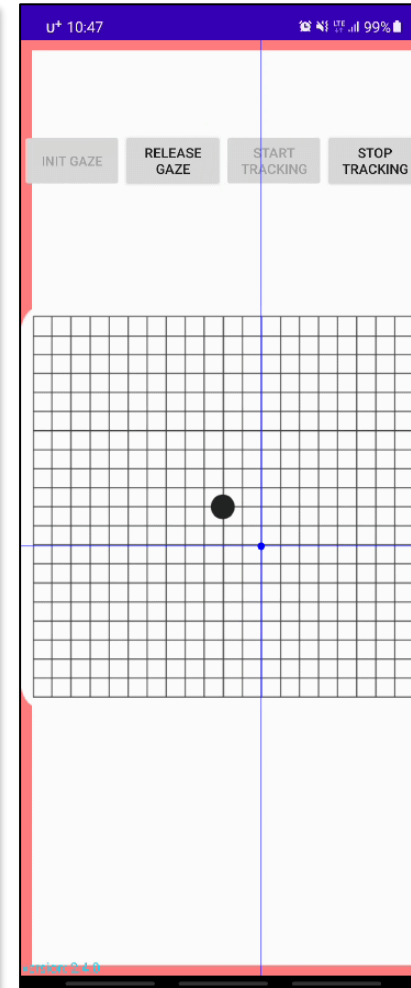
Competitive edge ► Mobile Sensing-based solution (applied for a patent)



High accuracy (95%)
Distance measuring
technology
(Galaxy / iPhone model)

An algorithm that
measures eye's
biological age
(presbyopia)

Chart conversion
algorithm according to
distance



Eye tracking
technology

Screen fixed
recognition

Keep track
of screen time

Applying distance measurement-based chart conversion algorithm

Vision Test + Near/Far-Sightedness

▶ Algorithm development

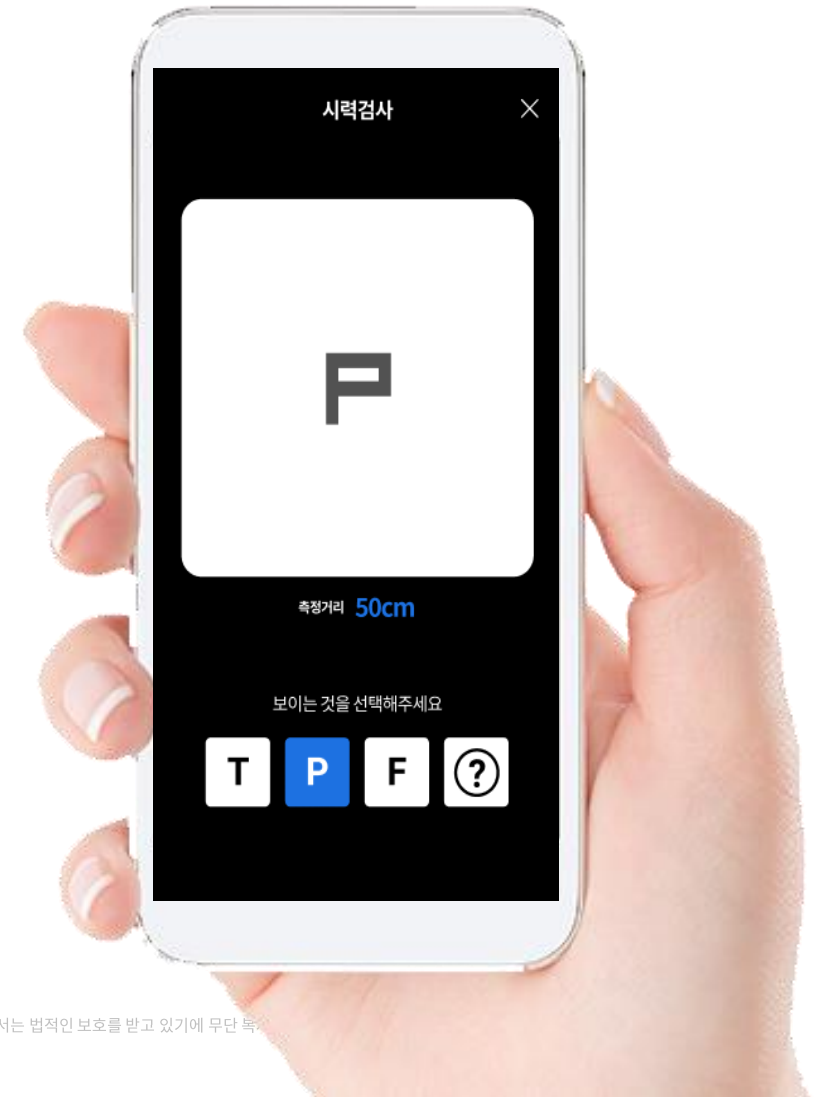
The distance between 40cm and 3m from the device is measured, and the answer corresponding to the chart is checked by looking at the chart through the eyesight test algorithm.

▶ Test order

1. With your smartphone in front of you, measure the distance between your eyes and the camera.
2. Stay comfortable at a distance of 40cm or more.
3. Check your left eye and right eye separately.
4. Check the answer according to the chart shown on the screen.

▶ If there's something wrong,

1. Save the checked information in My History.
2. Send the results to a retinal specialist.



Applying chart solutions based on real-time distance measurement

Amsler Chart + User Eye Sensing

► Algorithm development

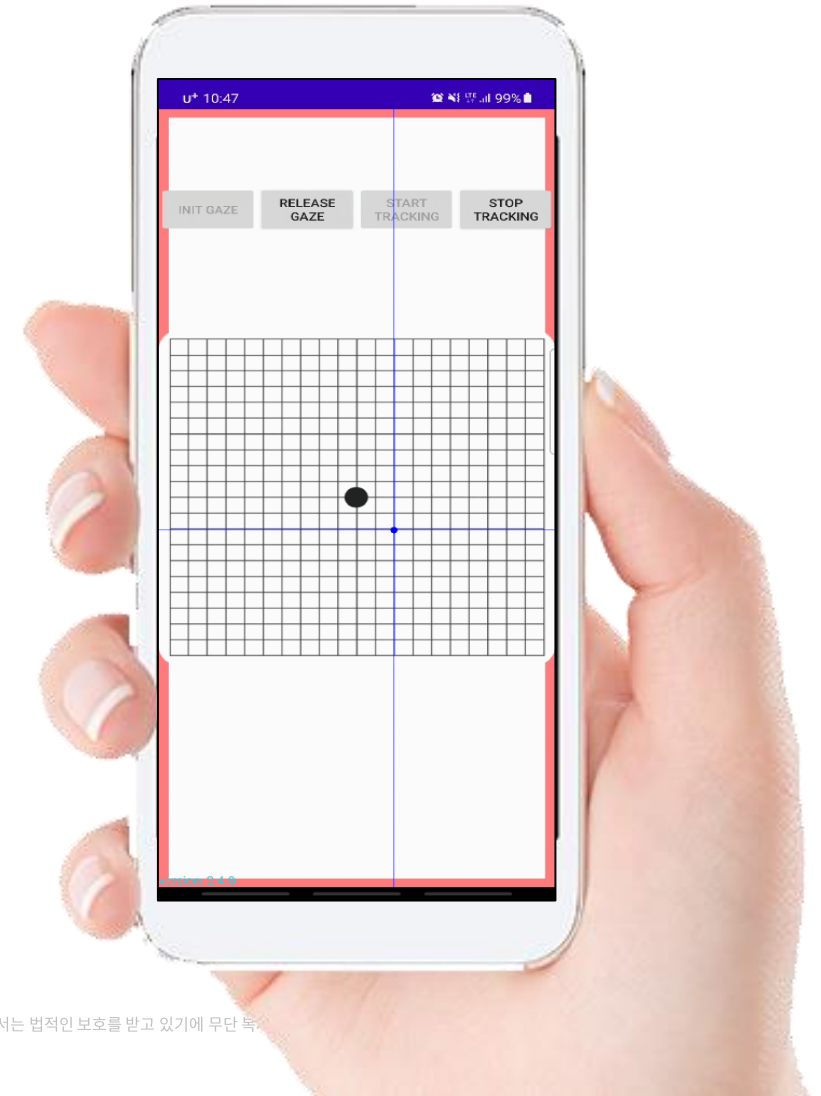
Touch the bent area by measuring the 30cm distance between the patient and the terminal in real time and apply sensing technology to a center point gaze command and eye tracking through a voice guide to the user.

► Test order

1. Using the camera distance measurement technique, 30cm distance is measured.
2. Track your left and right eyes separately to see if you're looking at the center.
3. Check if there's anything wrong with a yellow spot.
4. If there's something wrong, check the location and size.

► If there's something wrong,

1. Save the checked information in My History.
2. Send the results to a retinal specialist.



Applying cognition-based sensing solutions

Color Binoculars+ User Eye Sensing



► Color recognition image and algorithm development

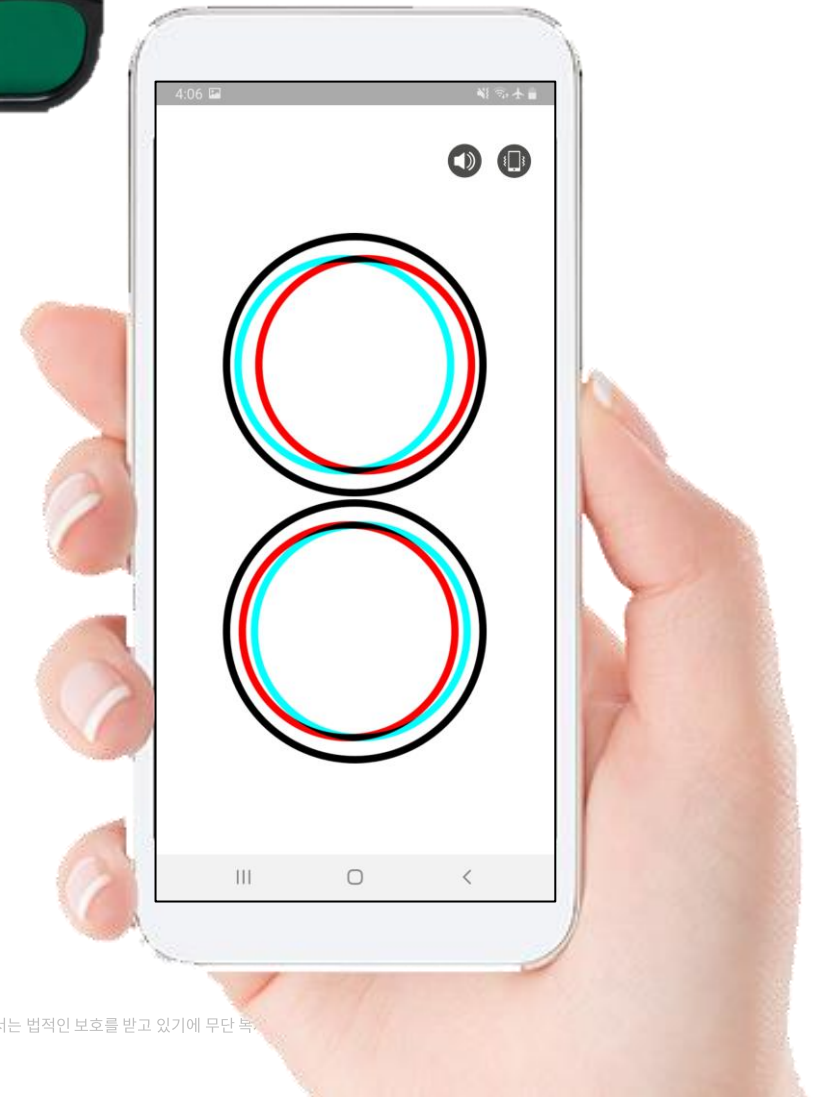
Determine cognitive ability according to the presence or absence of macular degeneration by measuring the distance between the patient and the terminal in real time while the users are wearing red green glasses/3D glasses. (Apply Color Binoculars to the content) → **Green and red, blue and yellow, and three modes recognize and classify a specific color**

► Test order

1. Do jigsaw puzzles with greater 3D effects wearing red green glasses
2. Check for abnormal symptoms according to the number of correct answers

► If there's something wrong,

1. Save the checked information in My History.
2. Send the results to a retinal specialist.



Provide **screen correction** and **expert connection services** through vision measurement

Predicting eye disease through mobile eyesight measurement
Eye therapy through mobile interaction

Digital ophthalmology

Providing a image algorithm such as color overlay/font for users of presbyopia and readability improvement film

Link the user's eyesight measurement data (image algorithm information) to ophthalmology and experts at optical shops
→ Use it for continuously advancing algorithm through expert feedback

Provide a mobile eye exercise program proposed by experts at the visual function research institute (Option)

South Korea's first digital eye care zone

Optical shop

Presbyopia and readability correction film image algorithm app is provided

User's eyesight data

(Information about age, male and female, visual information, image algorithm)

Visual function Research institute

User's eyesight data

User's exercise data

(Based on interaction)

(Focus, dementia, dyslexia)

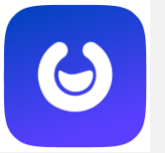
Ophthalmology

Presbyopia and readability correction film image algorithm app is provided

User's eyesight data

(Information about age, male and female, visual information, image algorithm)

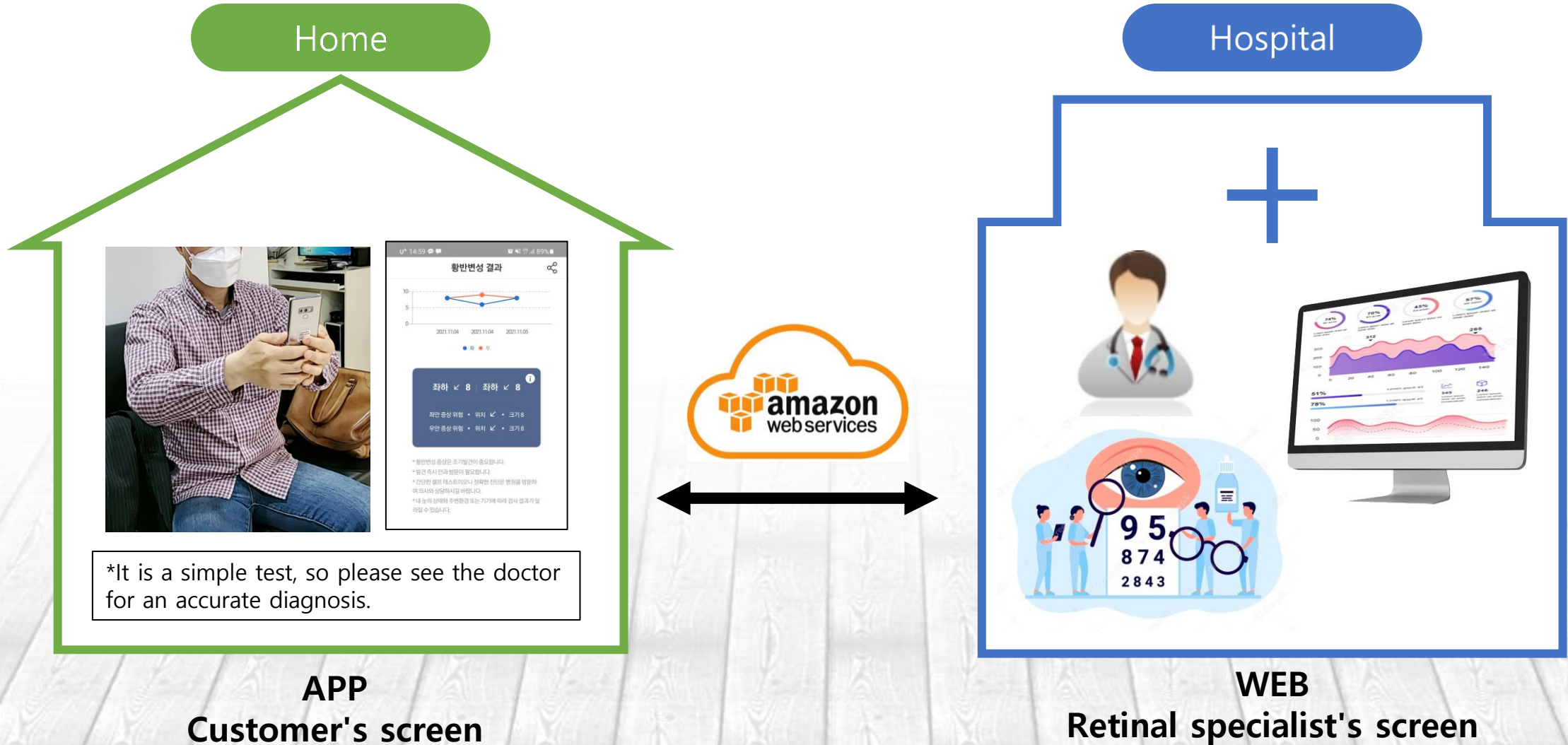
Quantification of eyesight, presbyopia, macular discoloration, and glare



pixelRo
Accelerated by SAMSUNG

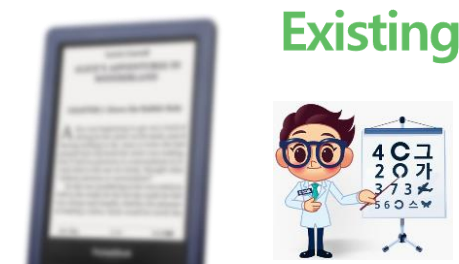
Link services ▶

Online-Connect to retinal specialists and easy UI/UX development



NENoon APP Eye measurement and AI-based eye care

Existing



Manager
Face-to-face training
Simple dementia education

Competitive edge



Self-eyesight protection
Online eye care
Improve learning efficiency
History of eyesight and self-eyesight protection
History of dementia prevention exercise
Levels of eye exercise using AI

Improve readability/ focus thereby increasing learning efficiency

Dementia prevention

Brain development

Eye protection/ eyesight correction

A 10-minute **eye exercise** a day helps prevent eye disease !

Health Chosun > Health news | Health Chosun editorial team | 2015.05.21



Platform channels

Optical shops and ophthalmology /smartphone/insurance company



Optical shop
Ophthalmology



Expert distribution sales and services through optical shops

- Proposal of new business areas for optical shops
- Expand store services based on App

Ophthalmologist sales distribution (Seoul/Busan EYE Clinic)

- Proposal of a new business area for sales services before and after ophthalmic surgery



The government,
The telecommunications
company, Insurance
company Online learning
Platform



Eye health measurement services of insurance companies and education

- Services exclusively for FC and health record application

Supply chain exclusively for carriers + user app download

- Service exclusively for telecommunication companies and affiliates

Services exclusively for social media + user app download

- Presbyopia correction font and correction film exclusively for social media

Global expansion strategy

North America

Western Europe

China
Japan

Focus on the mobile platform

Film

Android products: 5.5 million units per year
Galaxy market share: 24% in North America, 34% in Western Europe

■ Prediction of the market for Samsung Galaxy for presbyopia correction

■ Prediction of the market for non-Samsung Galaxy models for presbyopia correction

2 million units

North America

1 million units

3.5 million units

Western Europe

2.9 million units

APP

Medical tourism platform: pre and post eye disease management in Southeast Asia and Russia
Ophthalmology/Optical shops: Eye disease and glasses counseling platform

Focus on non-Samsung Galaxy models

Non-Galaxy Phone: market size 13 million units per year
Huawei, Oppo, Xiaomi : 45% market share

■ Prediction of the market for Samsung Galaxy for presbyopia correction

■ Prediction of the market for non-Samsung Galaxy models for presbyopia correction

1 million units

China/Japan

1.3 million units

North America

Using Samsung channel

- Using Samsung B2B's product marketing
- Participation in major exhibitions (CES)

Large offline distribution channels

- Wallgreen, etc. (OKTA, Linked to a project to set up a branch)
- Amazon sales

Western Europe

Using Samsung channel

- Using Samsung B2B's product marketing
- Participation in major exhibitions (CES, IFA)
- Using the branch office (UAE)

Large optical shop distribution model

- Participating in the optics exhibition
- Participating in the Medical Device Development Expo in Tokyo

China
Japan

Expanding the functional film channel

- Expanding the sales network online and offline
- Global crowdfunding: Indiegogo
- Japanese crowdfunding: Makuake

Carrier supply channel

- China Telecom
- (Incheon Center for Creative Economy & Innovation)

Commercialization strategy

Eyesight measurement and eye exercise

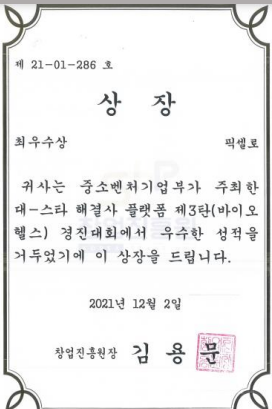
Near vision measurement (Measurement of vision, presbyopia, eye discoloration, etc.)
Development of interaction-based eye exercise

Link to optical shops /ophthalmology

Service platform after eyesight measurement
(Platform for consultation with optical shops and ophthalmologists) Expanding the market to medical tourism



Macular degeneration early diagnosis solution +Roche Korea



2021.2Q

Eye disease prediction
Eyesight, presbyopia, macular degeneration
Interaction eye exercise

2022.3Q

Eye disease prediction
Macular degeneration, dry eye disease
astigmatism medical tourism

Eye disease prediction
Dementia, focus care
location-based
glasses/ophthalmology services
(medical tourism)



Tablet computers are provided for sales support



Joint development / expansion of NENoon app



한국실명예방재단
Macular degeneration solution

pixelRo introduction



경영진



CEO Kang Seok Myeong



CTO Roh Jin Ki

SAMSUNG

- Developed next-generation display
- TV Health care PM
- Smart Signage PM
- Developed Wearable Device

SAMSUNG

- Developed optical device
- Developed Micro Projector
- Developed imaging device

광학/알고리즘/마케팅



Mass production
Film molding and manufacturing
Samsung Electro-Mechanics/
Hyundai Motor's business partner

Manufacture of lenses
A partner company of the Korea Institute of Industrial Technology for ultra-precision processing of lenses

Optical design/interpretation
optical doctor,
VR/LED/solar panel



Light Field Computing
VR, AR, Holographic



Light Field Analysis
Worked at MIRAE DISPLAY,
Samsung Electronics



고려대학교안산병원
KOREA UNIVERSITY ANSAN HOSPITAL

DCU 대구가톨릭대학교
DAEGU CATHOLIC UNIVERSITY

서울|부산 밝은세상안과

Healthcare Consulting

Investment status



Accelerated by **SAMSUNG**



Mobile-based vision measurement
and Vision correction

Think about the possibility!

