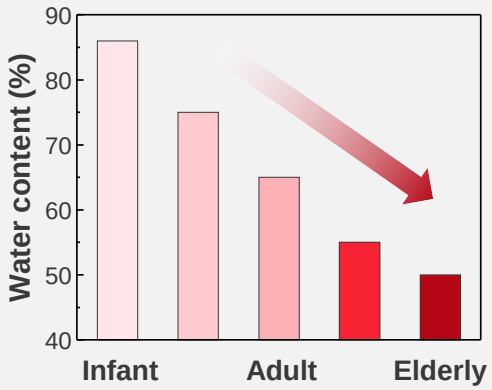
Real E-Skin

Junmin Suh, Ne Myo Han, Jihoon Kang
Massachusetts Institute of Technology

Image: The Berkey

Dehydration of elderly people

- Cognitive impairment
- Diminished thirst signal
- Less water content % (fluid imbalance coming from aged kidney)
- Frequent medication and possible diuretics



Elderly seniors
in high risk of dehydration

When dehydrated,

Dry mouth
Fatigue
Dizziness
Muscle cramps

Difficulty walking
Confusion
Rapid heart rate
Sleepier than usual

Dehydration is one of the most common diagnosis on admission to hospital for older adults

Dehydration of elderly people

To prevent dehydration,

Periodically drinking water or
Having a good habit of water supply

are the most suggested method.

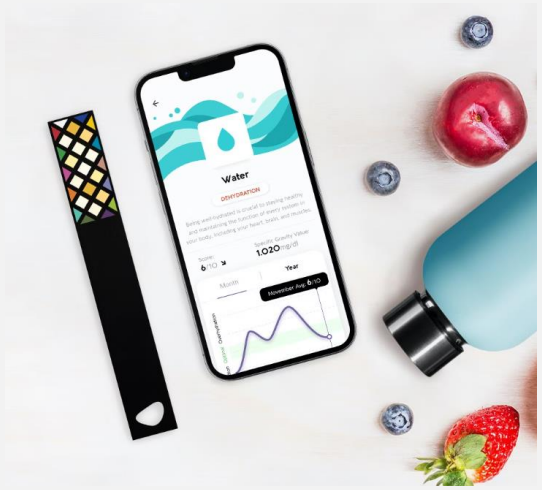
Continuous monitoring of dehydration needed!

Image: Elder Options of Texas

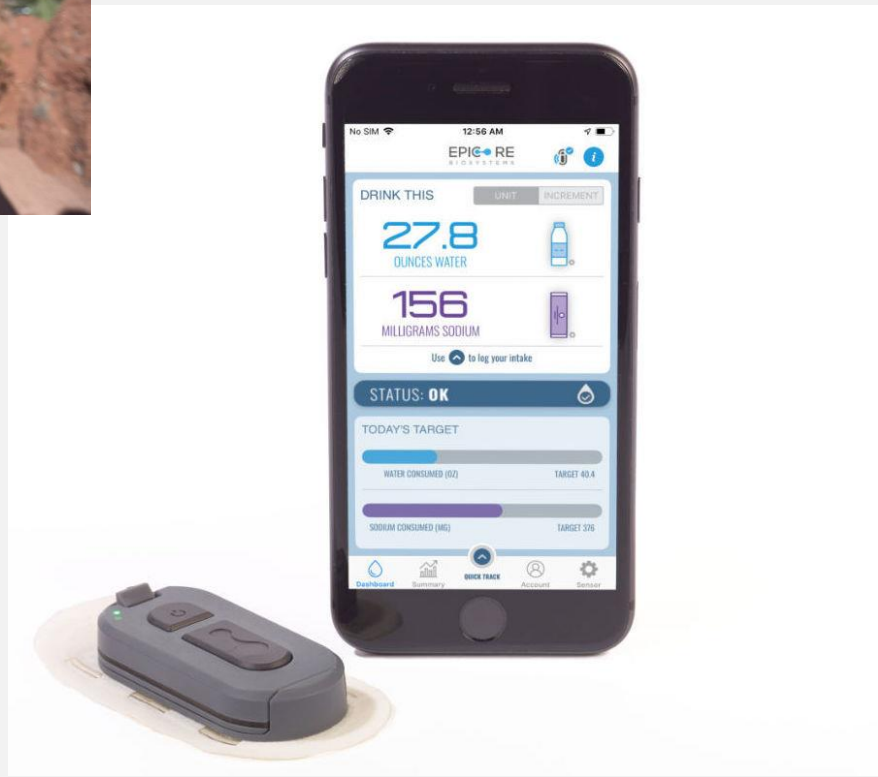
Current market

hdrop

nix

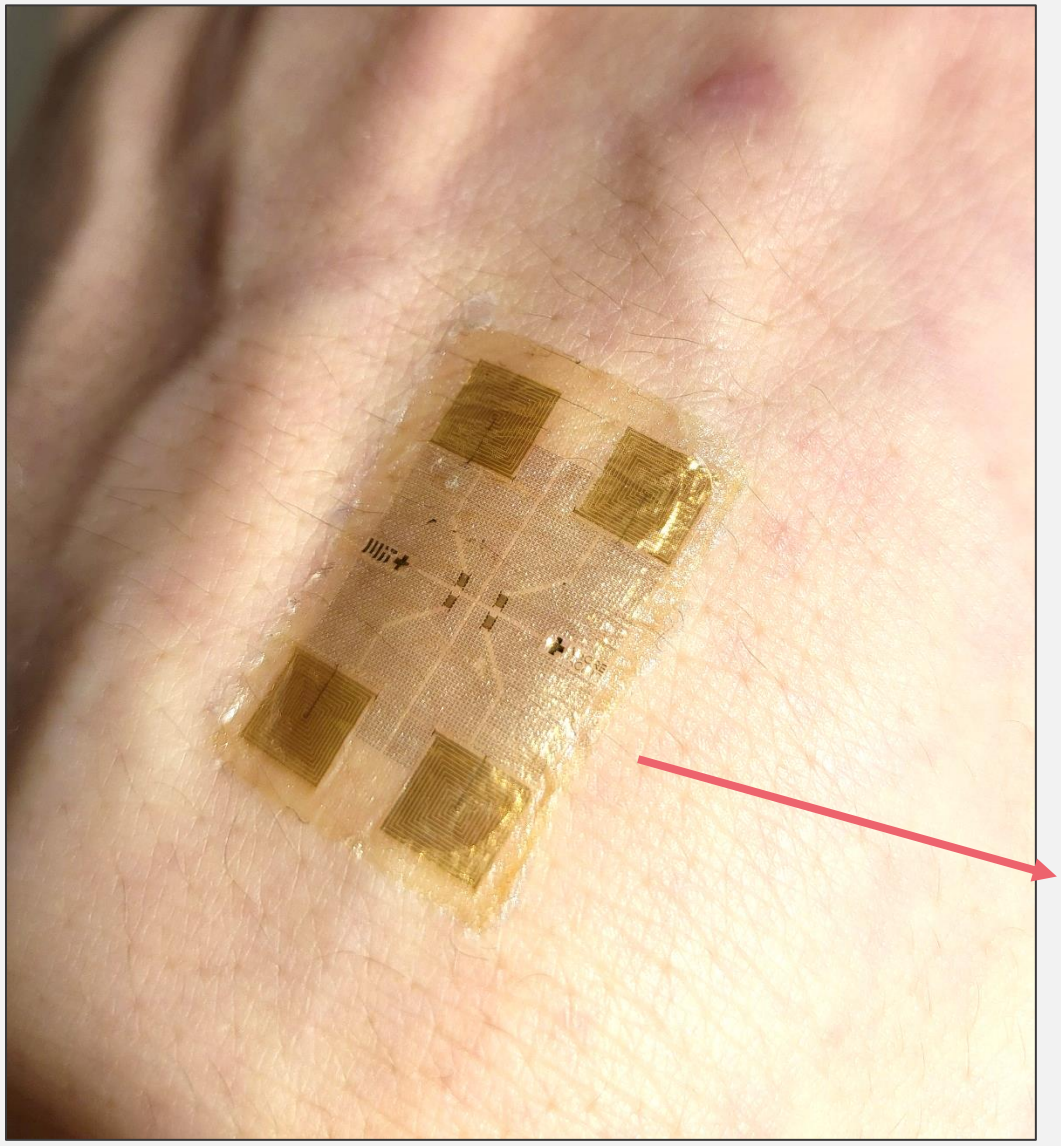


vivoo



Epicore

Electronic skin sensors for long-term wearability



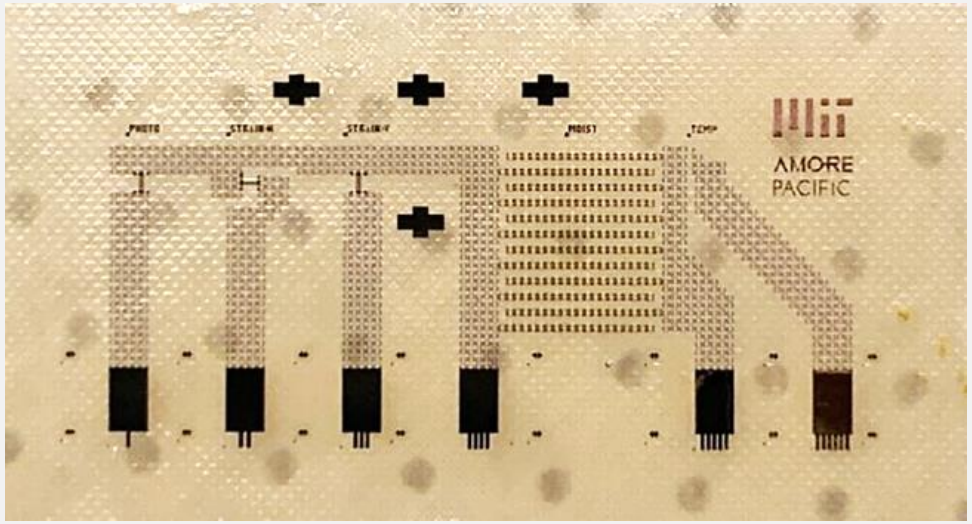
Electronic skin sensors

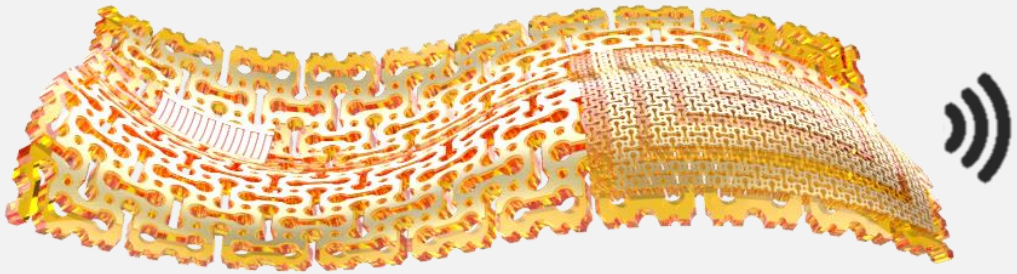
Extremely thin
Minimized perception of wearing
Highly conformal
Breathable
Stretchable
Flexible

Breathable pattern

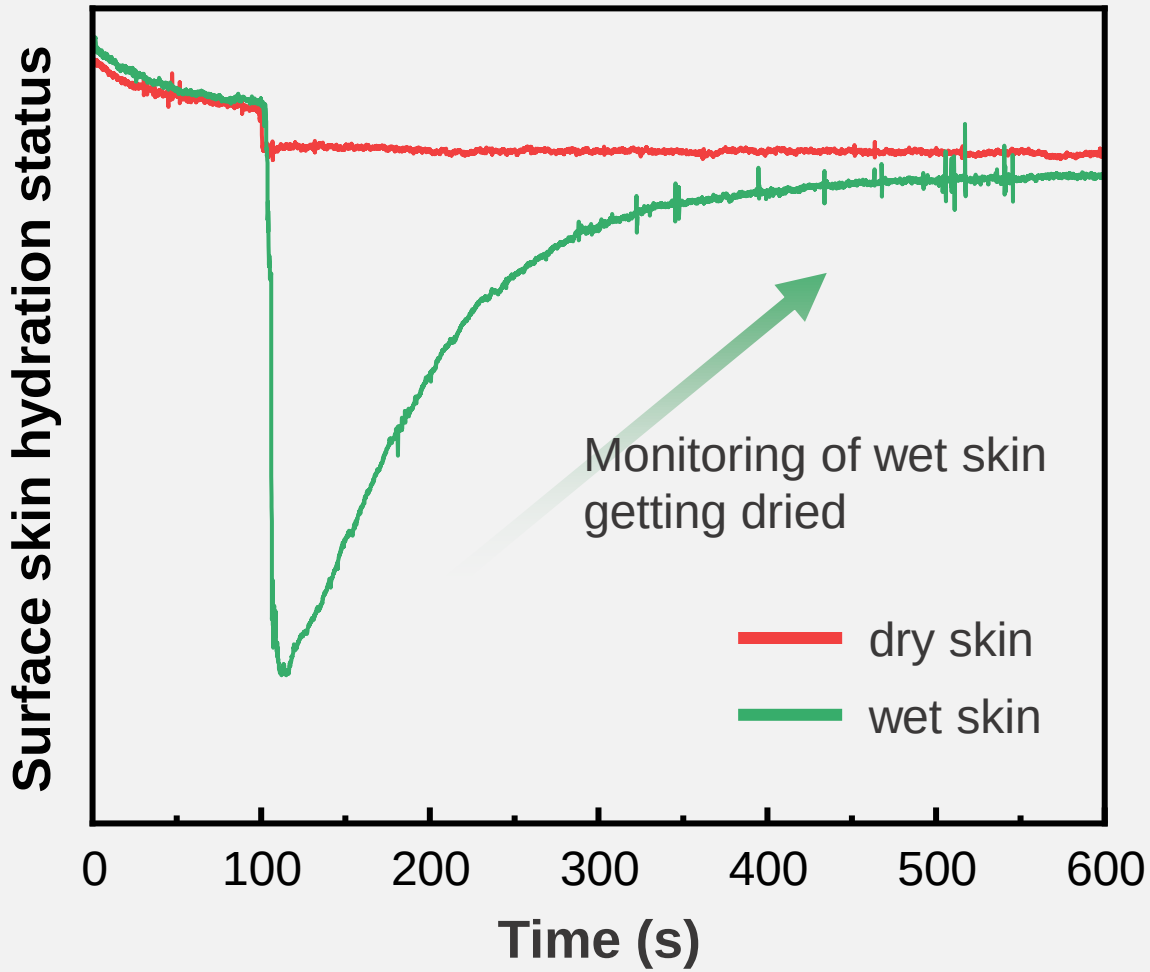
Electronic skin sensors for long-term wearability

Surface skin hydration sensor + **In-depth skin hydration sensor**





Wire-less communication



Our technology on electronic skin sensors

ScienceAdvances

Current Issue | First release papers | Archive | About

HOME > SCIENCE ADVANCES > VOL. 7, NO. 27 > LONG-TERM RELIABLE PHYSICAL HEALTH MONITORING BY SWEAT PORE–INSPIRED PERFORATED ELECTRONI...

RESEARCH ARTICLE | MATERIALS SCIENCE

Long-term reliable physical health monitoring by sweat pore–inspired perforated electronic skins

HANWOOL YEON, HANEOL LEE, YEONGIN KIM, DOYOON LEE, YOUNGJOO LEE, JONG-SUNG LEE, JIHO SHIN, CHANYEOL CHOI, JI-HOON KANG, [...] JEEHWAN KIM +17 authors Authors Info & Affiliations

SCIENCE ADVANCES · 30 Jun 2021 · Vol 7, Issue 27 · DOI: 10.1126/sciadv.abg8459

6,521 1

Science

Current Issue | First release papers | Archive | About | Submit manu

HOME > SCIENCE > VOL. 377, NO. 6608 > CHIP-LESS WIRELESS ELECTRONIC SKINS BY REMOTE EPITAXIAL FREESTANDING COMPOUND SEMICONDUCTORS

REPORT | FLEXIBLE ELECTRONICS

Chip-less wireless electronic skins by remote epitaxial freestanding compound semiconductors

YEONGIN KIM, JUN MIN SUH, JIHO SHIN, YUNPENG LIU, HANWOOL YEON, KUAN QIAO, HYUN S. KUM, CHANSOO KIM, HAN EOL LEE, [...] JEEHWAN KIM +24 authors Authors Info & Affiliations

SCIENCE · 18 Aug 2022 · Vol 377, Issue 6608 · pp. 859-864 · DOI: 10.1126/science.abn7325

5,356 CHECK ACCESS

MIT News

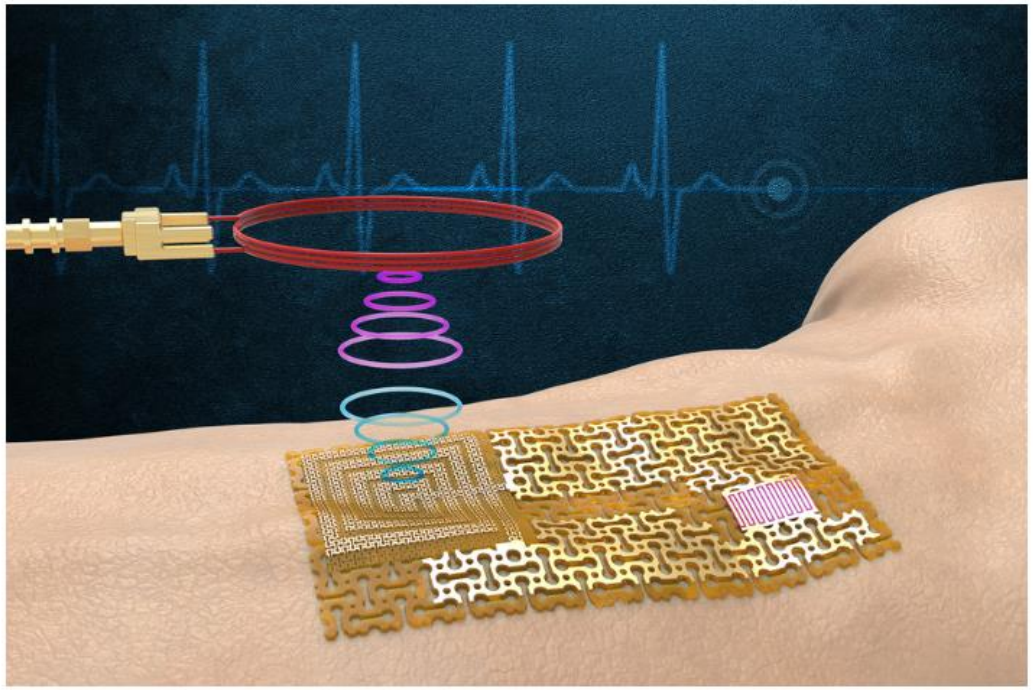
ON CAMPUS AND AROUND THE WORLD

SUBSCRIBE

Engineers fabricate a chip-free, wireless electronic "skin"

The device senses and wirelessly transmits signals related to pulse, sweat, and ultraviolet exposure, without bulky chips or batteries.

Jennifer Chu | MIT News Office
August 18, 2022



Our technology on electronic skin sensors

IEEE Spectrum FOR THE TECHNOLOGY INSIDER

Type to search

NEWS | SENSORS

E-Skin Sensors Go Chipless and Batteryless › Flexible, wearable devices promise VR and medical-monitoring applications

BY CHARLES Q. CHOI | 01 SEP 2022 | 2 MIN READ |

BeautyMatter BUSINESS CATEGORIES REPORTS PODCASTS EVENTS AWARDS WEBINARS CONTACT MEMBERSHIPS LOGIN SEARCH

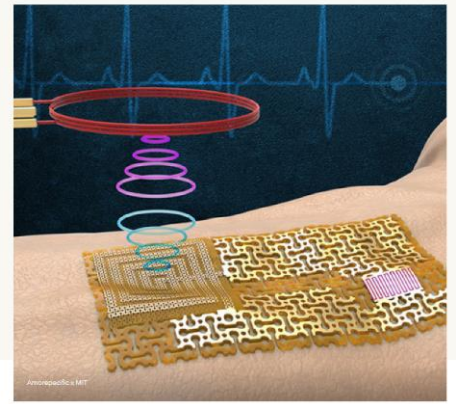
FEATURES

AMOREPACIFIC DEVELOPS SKINCARE'S FIRST WIRELESS E-SKIN

SOPHIE PITT

SEPTEMBER 15, 2022

FEATURE, TECHNOLOGY, SKINCARE



materialstoday
Connecting the materials community

Electronic

NEWS JOURNAL ARTICLES WEBINARS COMMENT FEATURES PODCASTS PRODUCTS EVENTS JOBS P

HOME » ELECTRONIC PROPERTIES » NEWS » PIEZOELECTRIC MATERIAL CREATES BATTERY-FREE WEARABLE SENSOR

Piezoelectric material creates battery-free wearable sensor

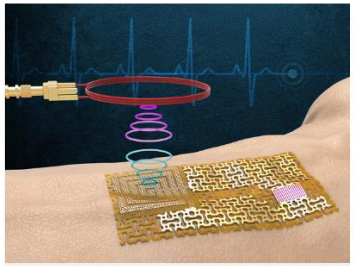
29 August 2022

BioWorld™ Clarivate™

BioWorld BioWorld MedTech BioWorld Asia BioWorld Science Data Snapshots Special reports Sign Out My Account Subscribe

See today's BioWorld MedTech

MIT, Amorepacific develop world's first chip-less, wireless e-skin



Gold deposited in a pattern of repeating dumbbells helps transmit electrical signals associated with individual medical data from MIT's "e-skin" to a receiver.

By David Godkin Sep. 6, 2022

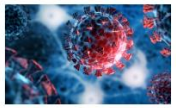
Massachusetts Institute of Technology (MIT) engineers in collaboration with South Korean cosmetic giant Amorepacific Corp. have created a chip-free, wireless electronic "skin" for sensing and transmitting vital medical signs minus larger, clunkier chips or batteries in most smartphones. MIT postdoc Jun Min Suh explained any change to the skin's conditions, such as an accelerated heart rate, affect the sensor's mechanical vibrations, generating an electrical signal that automatically transmits medial data to the consumer.

"The major advantage of our electronic-skin is that our sensor material can function as both sensor and wireless communicator without those bulky chips," Suh told *BioWorld*. "Our e-skin is so really thin so that the whole system conforms to the natural skin's surface and it's this that will be a major

Recommended Articles

Today's news in brief
BioWorld
BioWorld briefs for Sept. 8, 2022.

Study shows cellular immunity at six months post COVID-19 infection
BioWorld
LONDON – People infected with COVID-19 are likely to have T-cell immunity six months after contracting the virus, according to a U.K. study of 100 subjects who...



Chinese vaccines move one step closer to preventing Delta variant COVID-19
BioWorld

Pfizer vaccine less effective against India variant of SARS-CoV-2
BioWorld

Image: The Atlantic

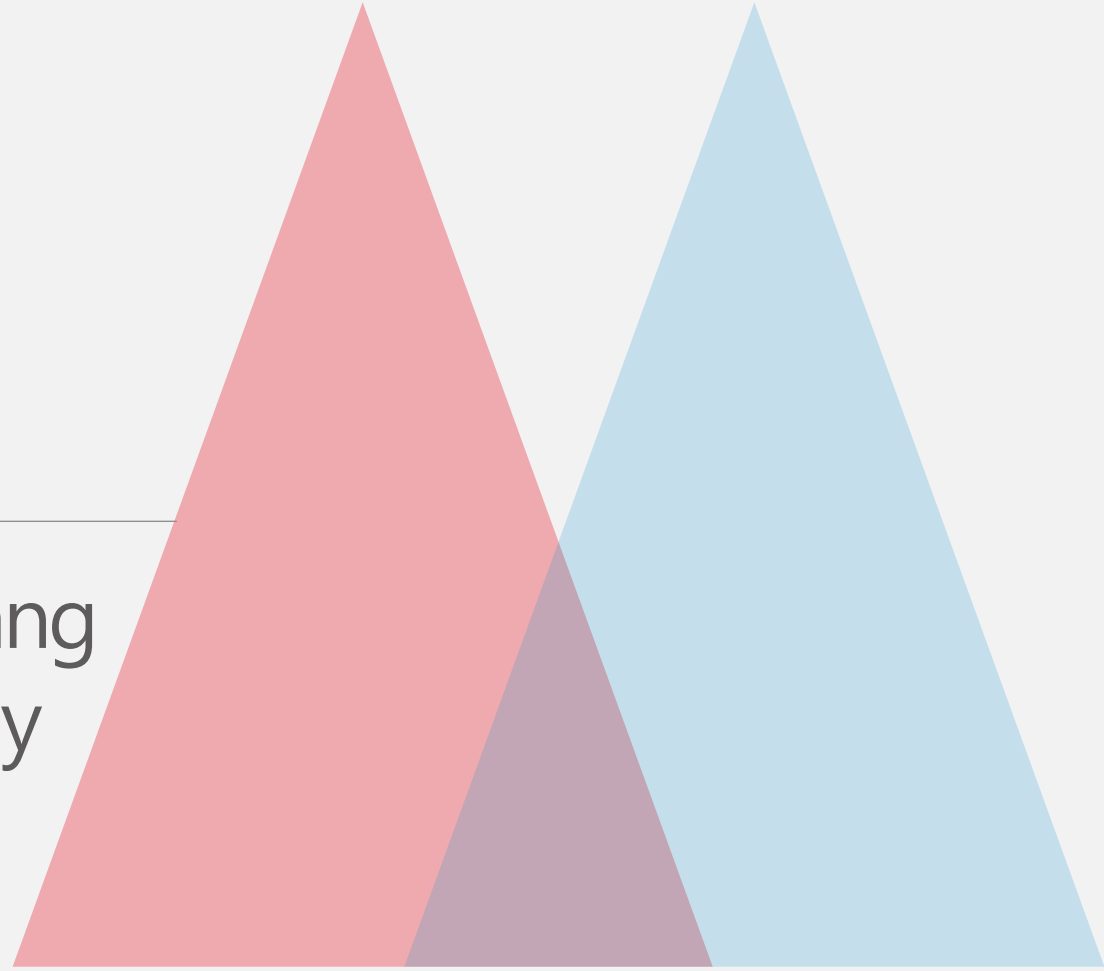
Who we are

Team Members

Jun Min Suh
Postdoc @ MechE
Ph.D. @ MSE

Ne Myo Han
Graduate student @ MechE

Jihoon Kang
Postdoc @ MechE
Ph.D. @ EECS



Thank you

Junmin Suh, Ne Myo Han, Jihoon Kang
Massachusetts Institute of Technology

IDEA²

Progress updates for IDEA^2

Specific targets are defined through a broad range of discussions.

- The previous target was to replace Holter monitoring devices.
- Now we target to develop precautionary medical devices that can prevent hydration, especially for the elderly population.
- All possibly targetable medical symptoms are discussed in the aspect of our e-skin sensing capabilities.

Several contact lists have been made.

- Actual meetings with 1 hospital physician and 2 companies have been done.
- Further interactions with others should be planned in near future.

Market studies have been done.

Overall, the Real E-skin team has been struggling in defining target customers although we have relatively well-develop technology. During the last 3 months, we could learn a lot from our mentors who are in the actual medical fields and well understand actual needs and state-of-art technology in the medical field. Through regular monthly meetings, we were able to narrow down our specific target goal and update our research statement.