NEC Innovation Day

01

Biometric Authentication

Business Growth
Driven by Biometric Authentication

NEC Fellow

Hitoshi Imaoka

1997	Joined NEC
2002:	Worked on R&D related to face recognition Contributing to the Commercialization of Face recognition Products
2009-	Ranked No.1 in the world in Face recognition benchmark test by NIST* five times *National Standards and Technology Research Laboratories
2015-	R&D of new fields utilizing knowledge of Face recognition such as Endoscopic Cancer Diagnosis Support System, remote gaze estimation technology, and ear acoustic authentication technology
2019	Appointed as NEC Fellow
2021	Responsible for Digital Business Platform Unit and Global Innovation Unit

"Face"
in Face recognition
DX fellow

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Hitoshi Imaoka

"Essentials of Face Recognition"

World of cutting-edge AI to create future business

Released by President Inc on December 1, 2021

An easy-to-understand explanation of the cutting-edge AI technologies that will create businesses tomorrow, how to use them, and many examples of implementation

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NEC's Biometric Authentication

Identifying individuals by physical characteristics

Business applications expanding to payment and medical care etc.

Authentication accuracy which identifies 8 billion human individuals on earth

Creating new value for a society of new normal

Already implemented more than 1,000 systems in 70 countries and regions around the world

NEC's technology

Bio-IDiom

顔	虹 彩	指紋・掌紋	指静脈	耳音響	声
Face	Iris	Fingerprint / Palm print	Finger vein	Ear acoustics	Voice

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World's No.1 Biometric authentication technology

Not only Face recognition, but also possesses world-leading technologies in major Biometric authentication (face/iris/fingerprint)
2021 Worldwide Top Acquired Double Face recognition and Iris recognition

Face Recognition

World's No.1

FRVT Ongoing (2021)

FRVT   (2019)
FIVE   (2017)
FRVT   (2013)
MBE   (2010)
MBGC   (2009)

Multi-modal

Iris Recognition

World's No.1

IREX 10 (2021)

IREX IX (2018)

(Iris Exchange IX)

Fingerprint Recognition

World's No.1

Acquired 8 times in total

MINEX   (2016,2006)
PFT/PFTII   (2013,2009)
FpVTE   (2012,2003)
SFSE   (2004)
ELFT   (2007)

Newborn fingerprint

※NEC's fingerprint Identification technology, Facial recognition technology, and iris recognition technology are ranked first in benchmark testing conducted by National Institute of Standards and Technology (NIST).
※NIST does not recommend a particular product/service/enterprise by the U.S. government.

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World's first
(out of 62 companies worldwide)

Latest research by Frost & Sullivan
(2020 Global Biometrics in Security Market)

the company's **significant R&D investments** in facial, iris, fingerprint, finger vein, and behavioral biometrics, have vaulted **NEC to industry leadership** not only in accurate and multimodal biometrics but **also in developing relevant and modernized identity solutions that are highly scalable.**

As the pioneer of many of the world's largest national biometric ID programs, significant passengerbiometric and identity programs, and large-scale biometric access control systems, **NEC remains the global biometric industry leader.**
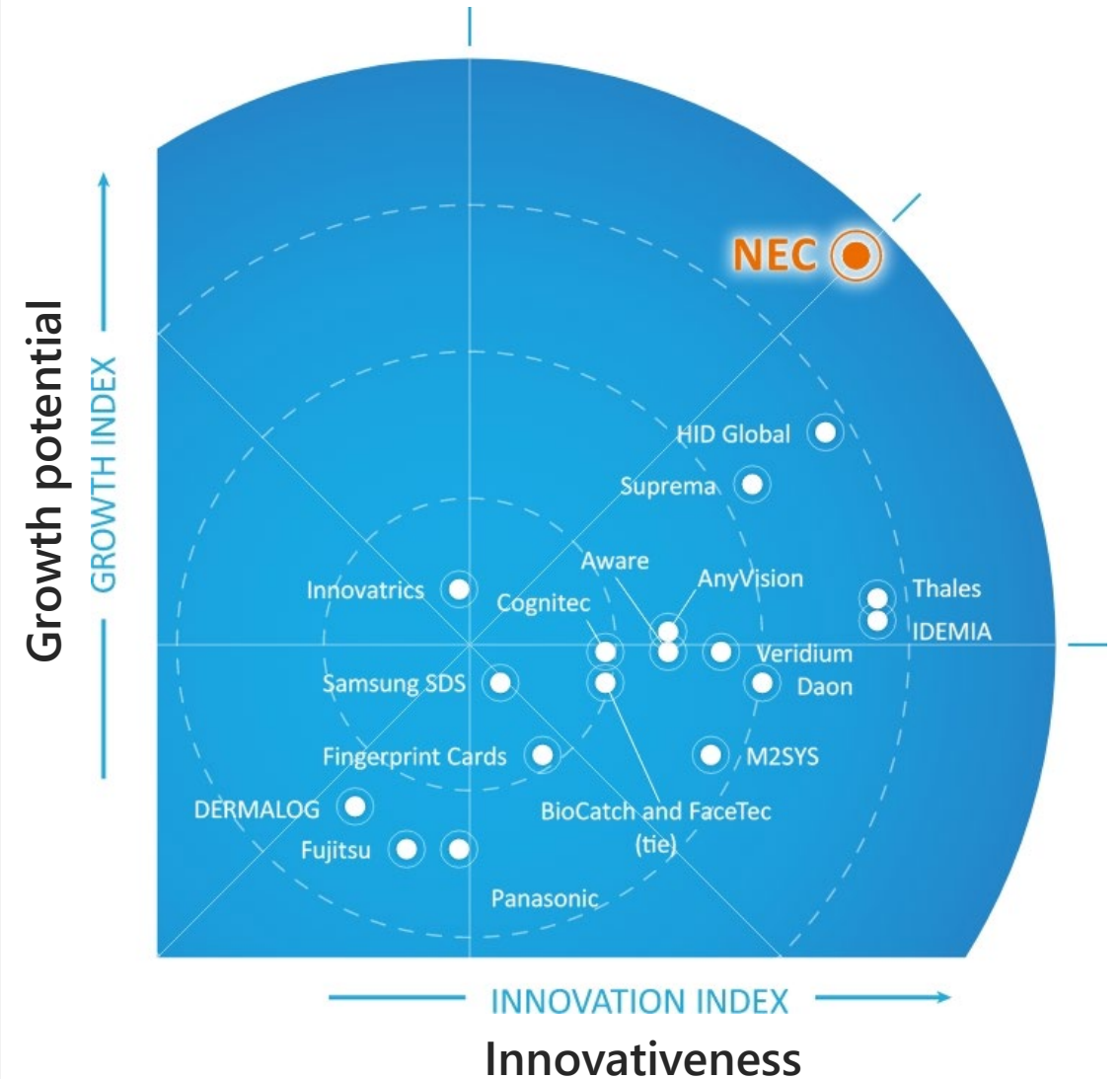
Source: Frost & Sullivan "Frost Radar™: Biometric Solutions within the Security Industry, 2020

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Biometric Authentication

First in the hotel industry
Face and iris multi-modal Biometric authentication Entrance Control

NEC's Multimodal biometric authentication contributes hotels to achieve both advanced security measures and identification efficiency during major international sporting events

Hotel Mariners' Court Tokyo

From July 13, 2021 to September 10, 2021, NEC conducted a demonstration of a multimodal biometric authentication access control system that combines face and iris recognition for hotel employees

・A multimodal biometric authentication system using face and iris has been installed
  at the employee entrance.
・Identification of employees passing through the employee entrance, and manage their history by linking with the access control system.
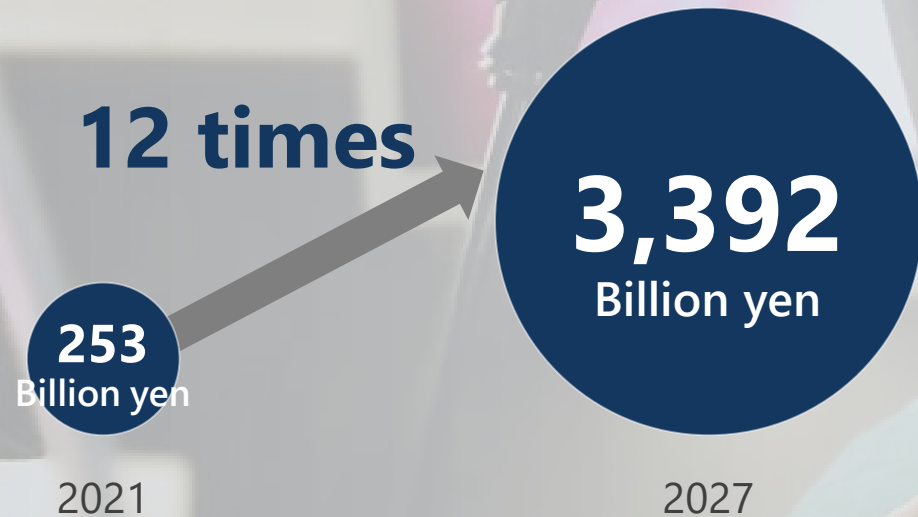
Multimodal Biometric authentication

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Technology That Create the Future Healthcare and Life Science

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Find Cancer Accurately

Forecasted Market Size of AI Diagnostics (Global)

12 times

3,392
Billion yen

253
Billion yen

2021

2027

https://www.theinsightpartners.com/reports/software-as-a-medical-device-market
Artificial Intelligence in Healthcare Diagnosis – Forecast to 2027 COVID-19 Impact and Global analysis, Insight partners

Aiming to find cancer accurately with the world's No.1* face recognition technology

January 12, 2021
Colorectal Cancer
Started sales in Japan

May 28, 2021
World's first
Barrett esophageal cancers
Conformed to CE Marking Requirements

*Starting in 2009, wins first place in face recognition benchmark testing by National Institute of Standards and Technology (NIST) https://jpn.nec.com/biometrics/face/index.html
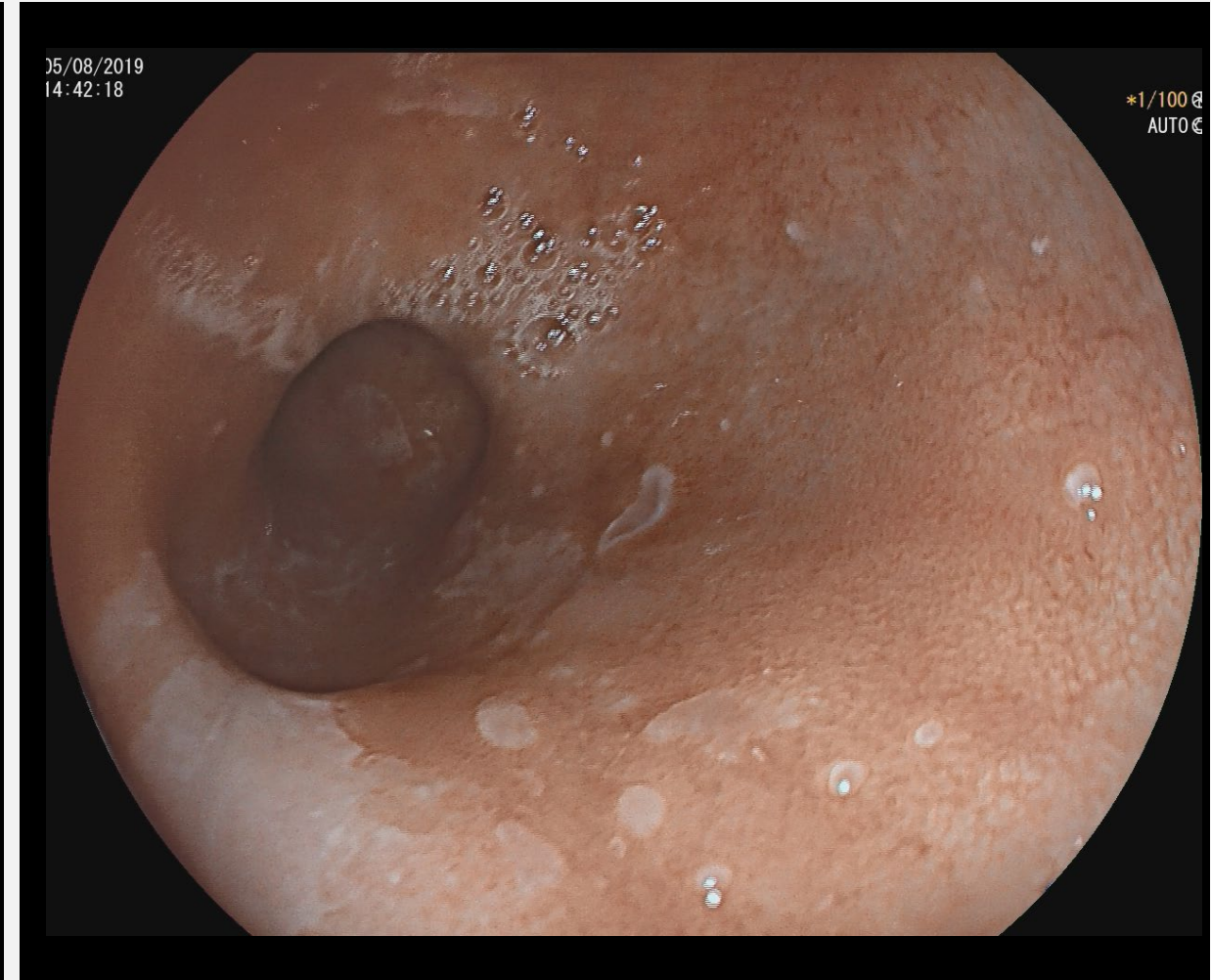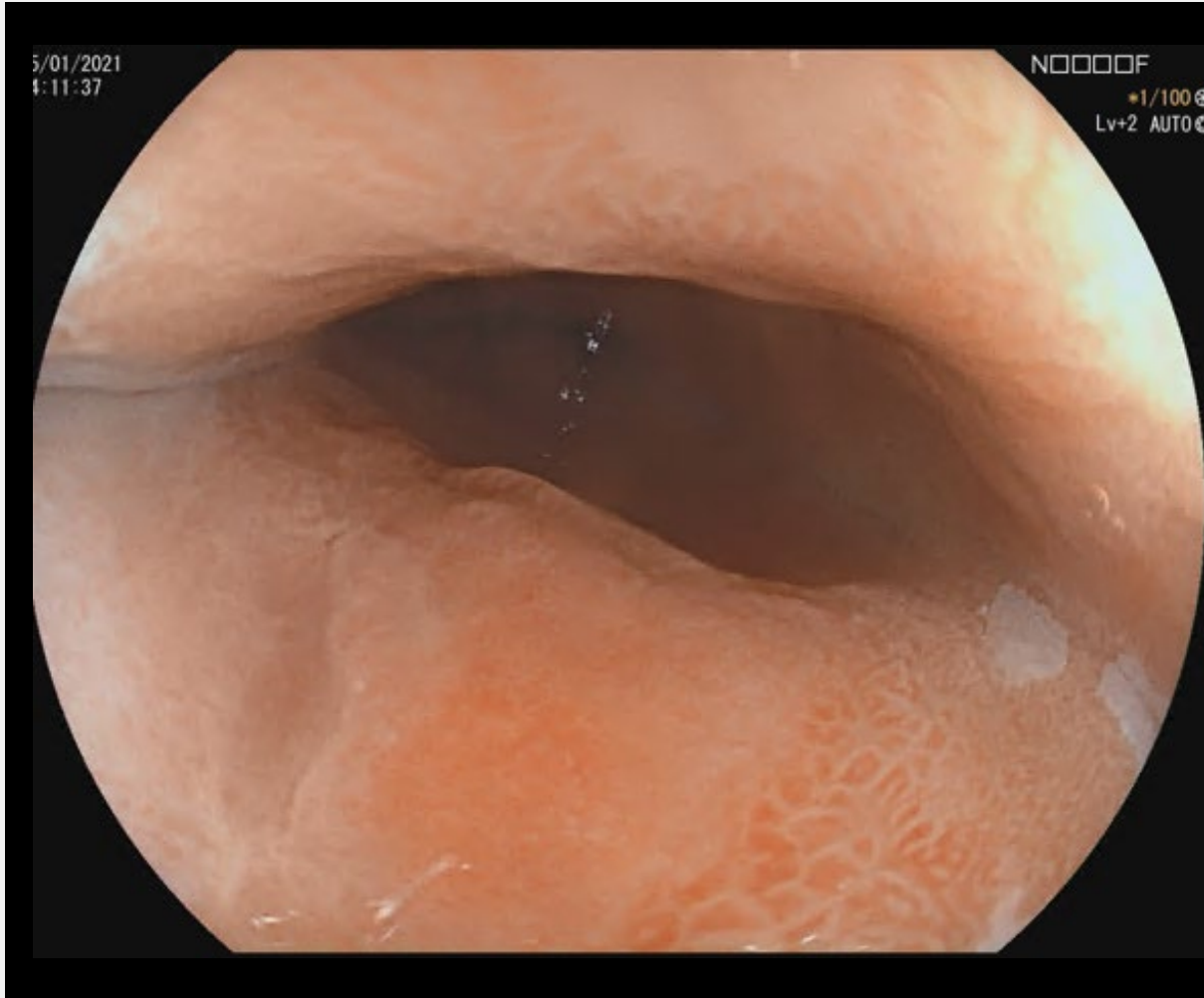
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Which one has cancer?

Data source: Portsmouth University Hospitals NHS UK

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Data source: Portsmouth University Hospitals NHS UK

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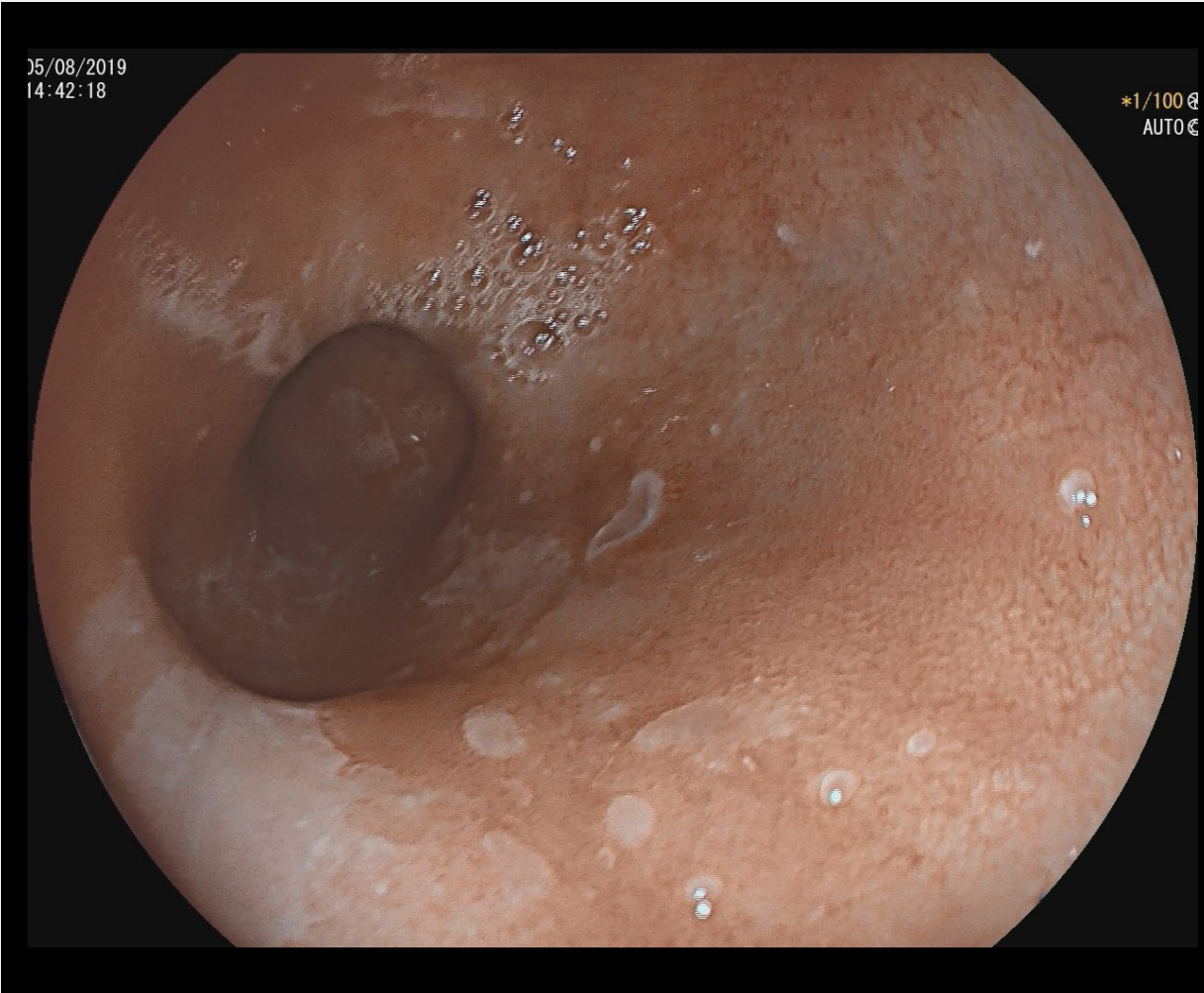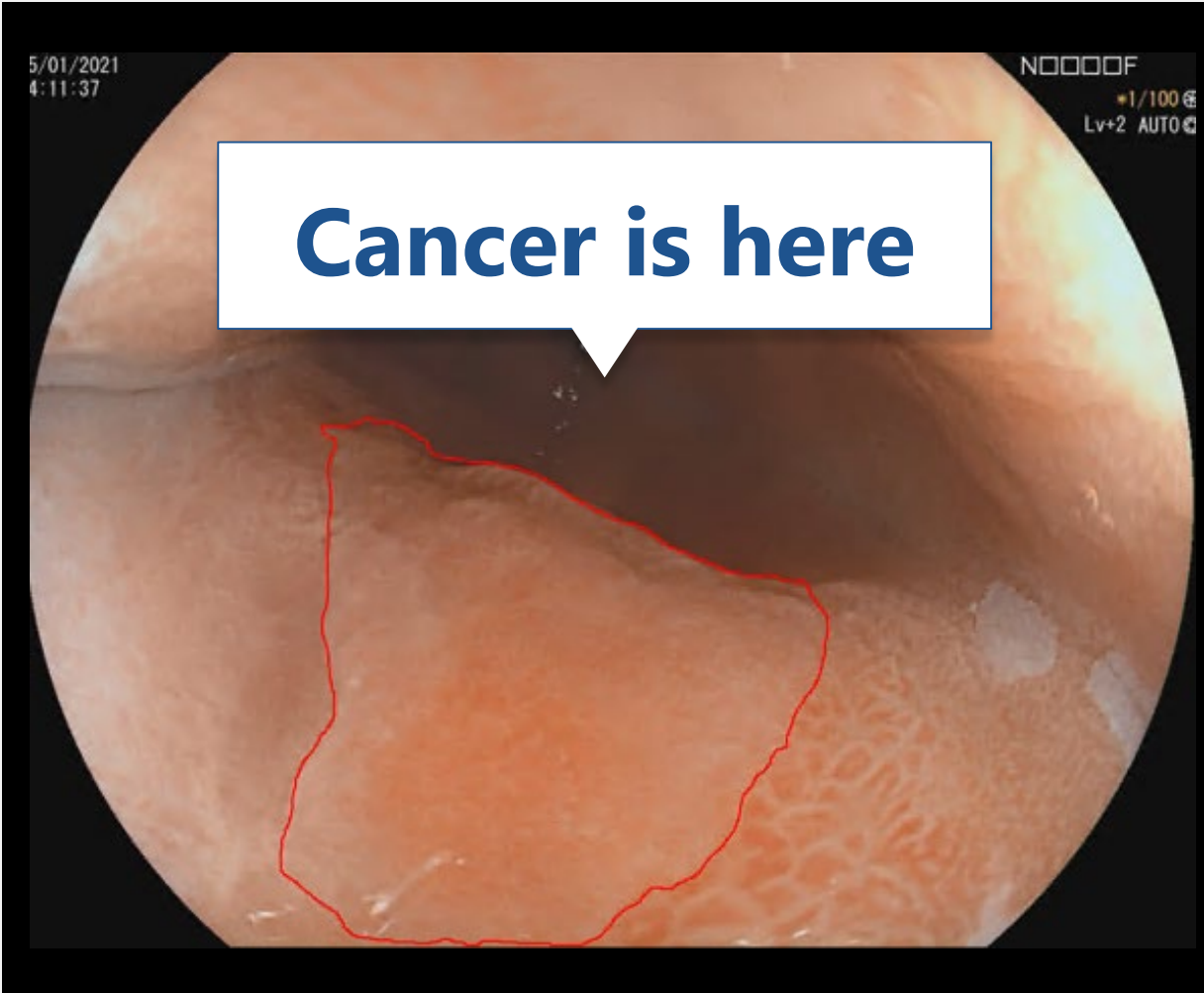
Tokyo Medical and Dental Univ. (Medical knowledge) × NEC (AI/IT Technology)
Started physical care services using AI technology (June 2021)

ひとと技術であなたの健康に寄り添う
NECカラダケア
supported by 国立大学法人東京医科歯科大学

歩行。姿勢。呼吸。
あらゆる場面で身体を正しく使えている人は
ほとんどいません。
この長年の蓄積が現代人の不調を引き起こします。

フィジカルケアでは、

一人ひとりの身体の状態を紐解き、本来の正しい動きに導きます。

NEC Karada-Care Kagurazaka Store   2021.6.15 Open

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Concept of Healthcare Applications with Face recognition

Work and Home Physical condition Check	Entry and Exit Control Entry and Departure Physical condition check	Safe driving Support	Watch	Prevention and early detection		Remote medical support

Face image

Change in facial color	Physiological information	The (inner surface) condition of a person		Diseases
Face Movement	Heart rate variability	Cognitive function		Cognition
Sightlines	Heart rate	Emotions		Psychiatric disorders
Blink	Body surface temperature	Stress		High pressure
Pupil diameter	Breathing Rate	Concentrating power		Cardiac Diseases
Iris movement	Blood oxygen levels	Degree of arousal		Diagnosis
Expression*	Blood ALC concentration	Degree of tension		Cancer
	⋮	⋮		⋮

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