

How to obtain patents in Artificial Intelligence related inventions in JAPAN



Photo by hogeasdf

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Shuichi Shitara

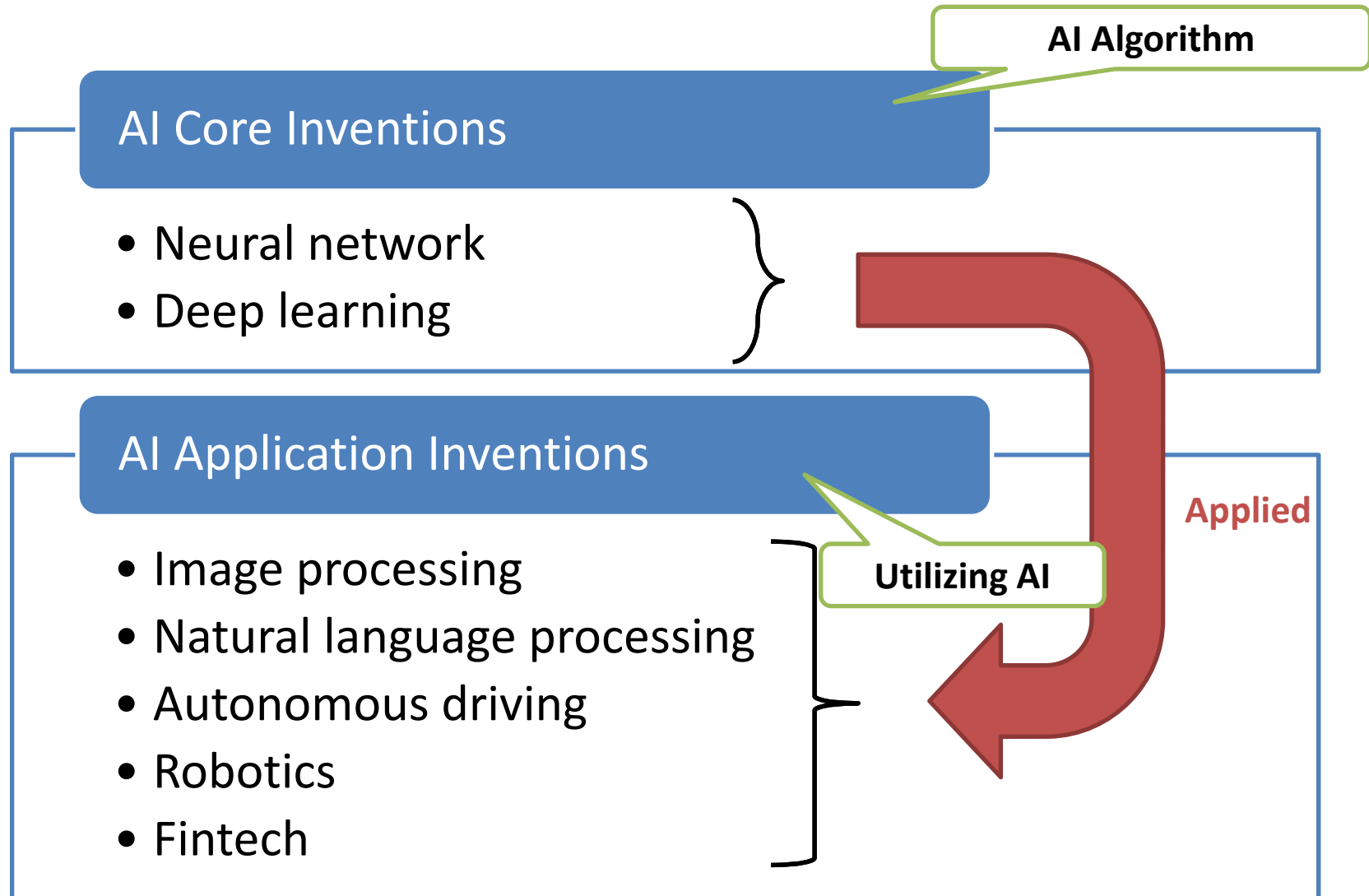


Taiyo, Nakajima & Kato

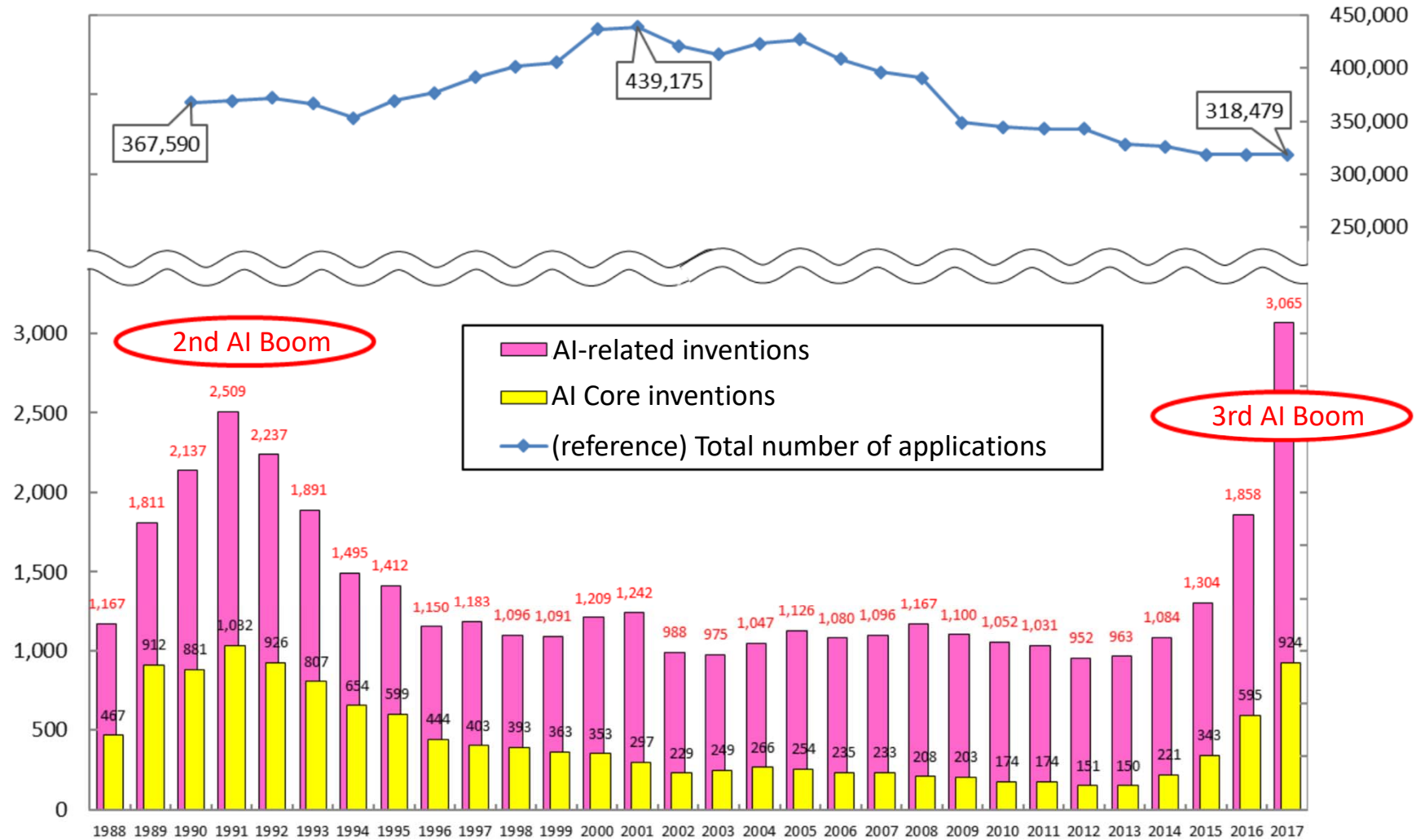
Title:	How to obtain patents in Artificial Intelligence related inventions in JAPAN
Abstract:	<ul style="list-style-type: none">- trends, statistics- laws, rules- tips, recommendations, claims/specification drafting technique

Statistics

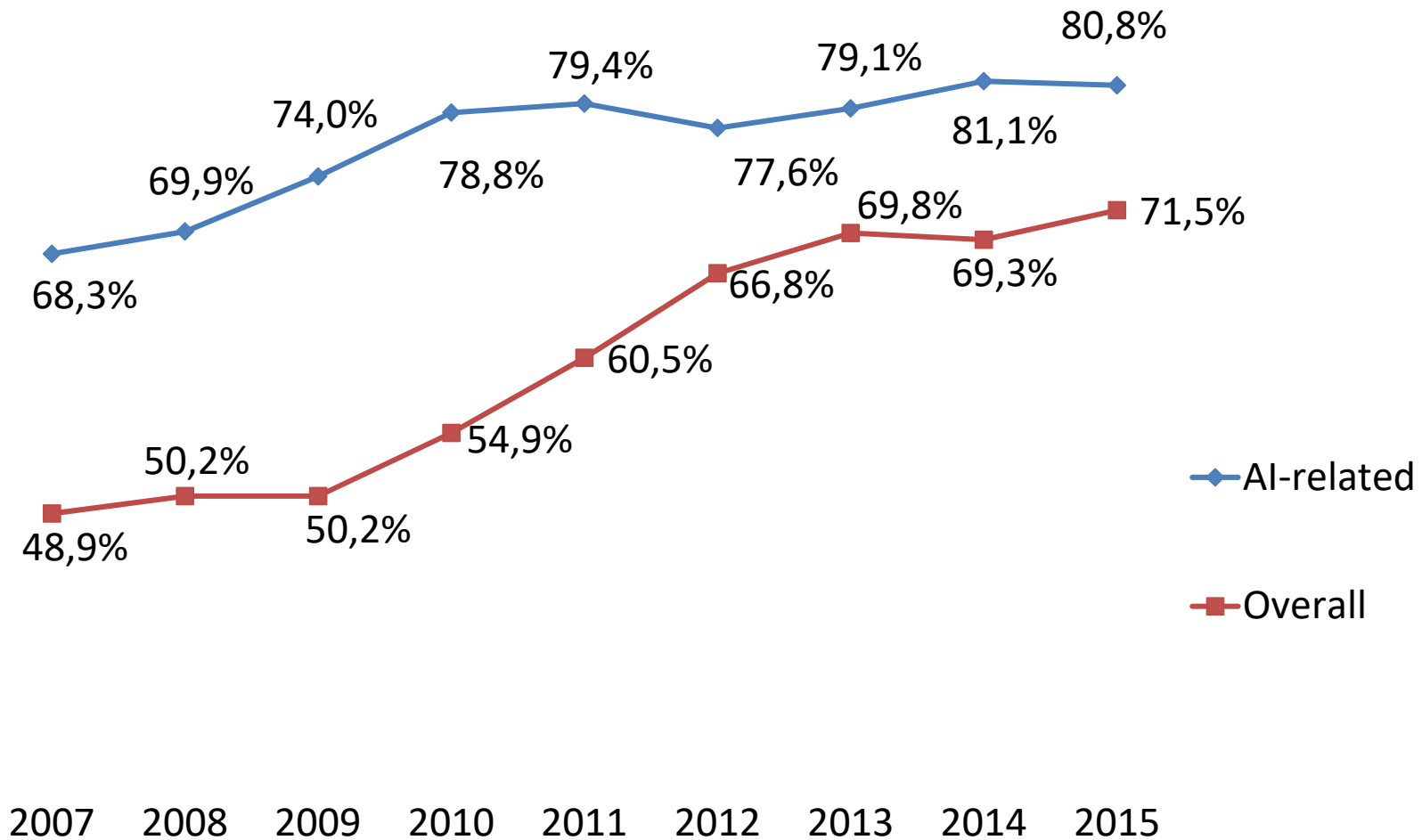
AI-related inventions



Number of Patent Applications in AI-related inventions



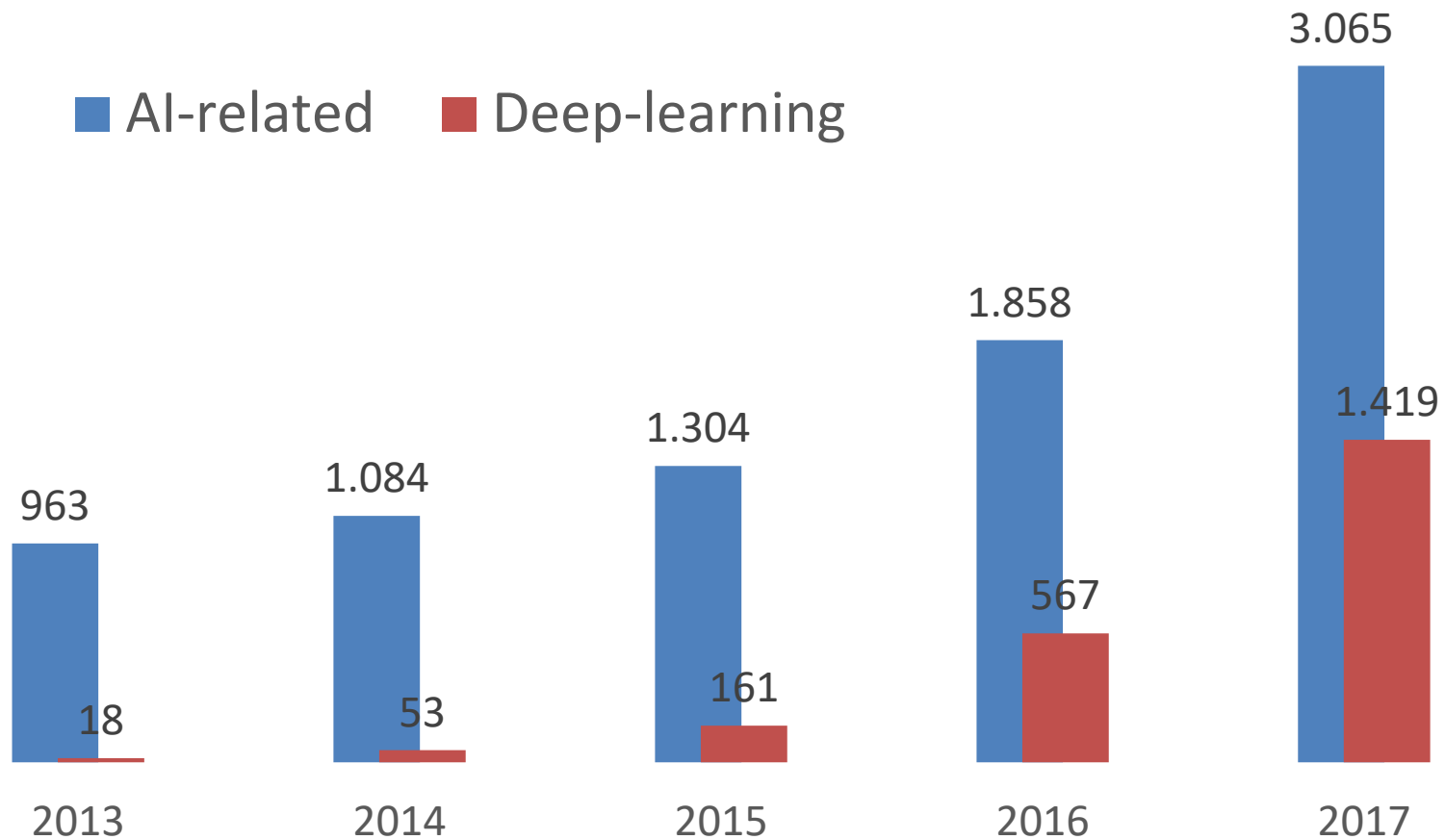
Patent Grant Rate



Definitions

JPO: $\text{number of allowed patents} / (\text{number of allowed patents} + \text{number of refused applications} + \text{number of withdrawn/abandoned patent applications that have been examined})$

AI-related inventions in which Deep-learning is mentioned in specification



New Claim Category

Traditional claim category

- Method
- Apparatus
- Recording medium
- Program

New claim category

- Trained model
- Data having a structure
- Data structure

Must include the procedures how these are processed by a computer.

≠ “presentation of information”

Treated as “Program” claim

Patent eligibility of AI-related inventions

- Applicable Standard: Standard applicable to other software-related inventions

[Standard for software-related inventions]

- whether or not information processing by software is specifically implemented by using hardware resources



- whether or not a certain information processor for an intended use is constructed through cooperation of software and hardware resources

Examination Guideline

- New examples have been added to clarify the standard for AI-related inventions (January 2019)
 - Written description requirement (Enablement requirement)
 - Inventive Step

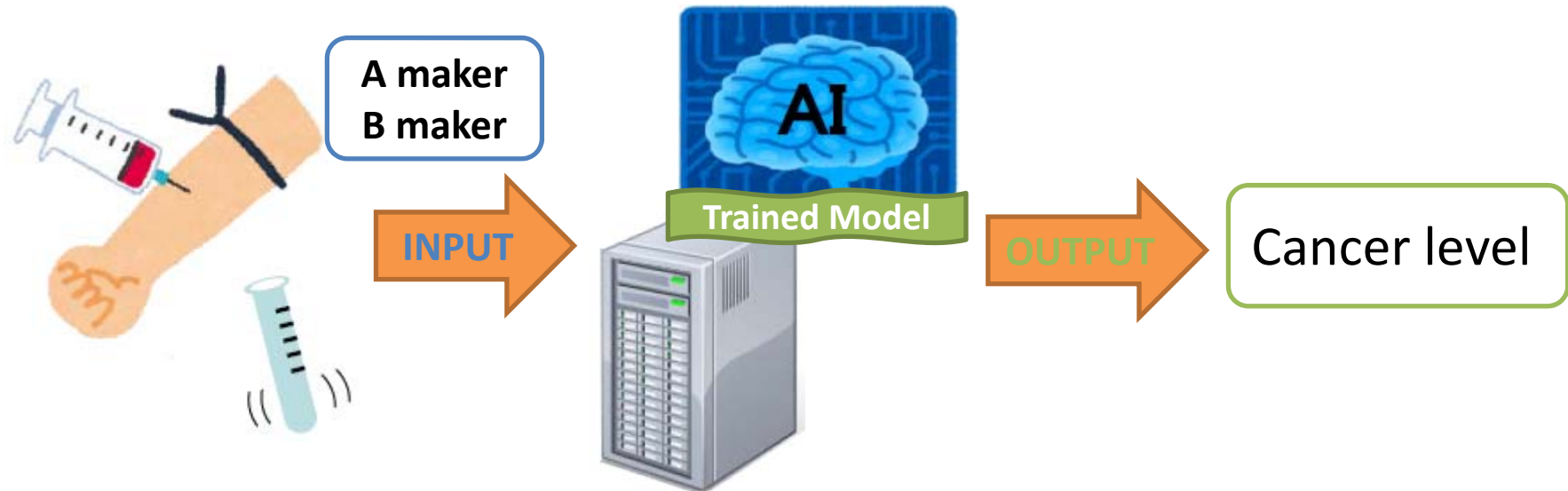
EXAMPLE 1

Simple computerization using AI

[Invention]

Cancer level calculation apparatus

- ◆ Possibility of cancer is calculated based on the measurement of A marker and B marker
- ◆ Utilizing trained neural network



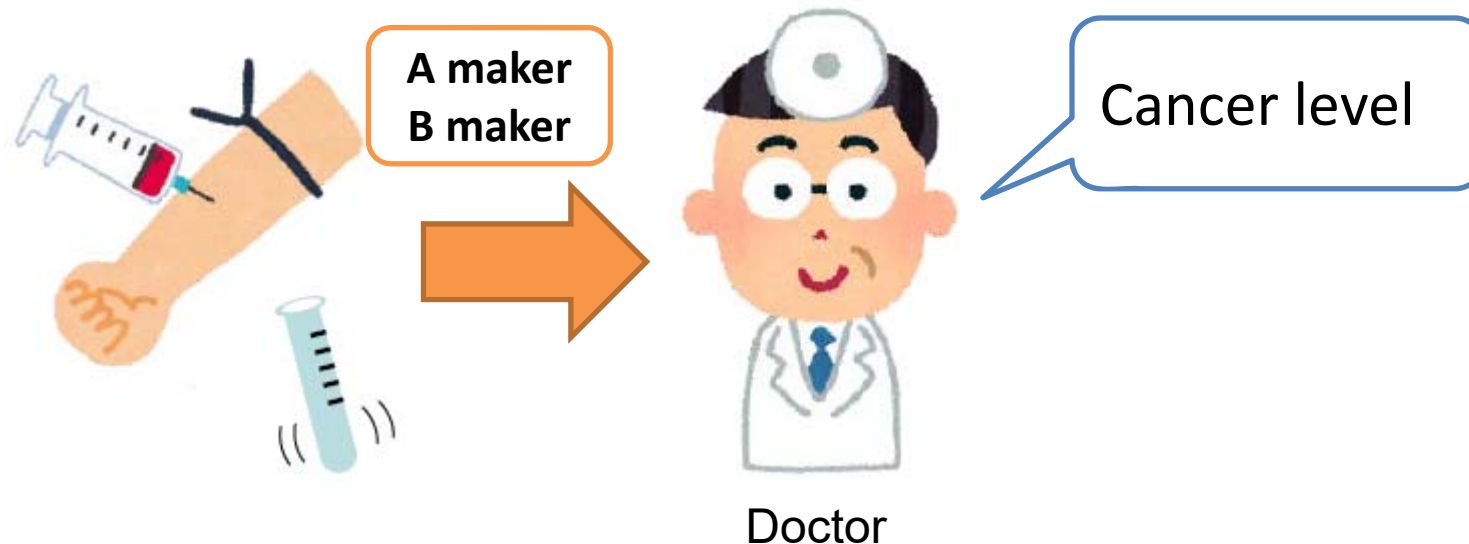
Cancer level calculation apparatus

EXAMPLE 1

Simple computerization using AI

Rejected!! (lack of inventive step)

- Simple computerization (by AI) of the estimation method used by medical doctors
- Demonstration of normal creativity of one skilled in the art



EXAMPLE 2

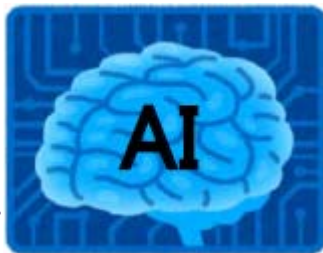
Correlation among plural training data

[Invention]

Body weight estimation system

Training Data

- Height
- Weight
- Feature that expresses shape of face



Trained Model

Learning...

- Height 171.5 cm
- Photo of face



INPUT



Trained Model

OUTPUT

Weight = 69.6 kg

EXAMPLE 2

Correlation among plural training data

Claim 1

Training Data

- Height
- Weight
- Feature that expresses shape of face

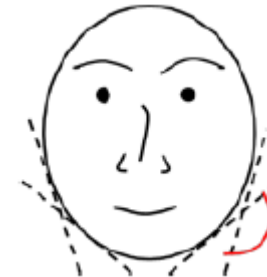
Claim 2

Training Data

- Feature that expresses shape of face

LIMITED TO

face line angle



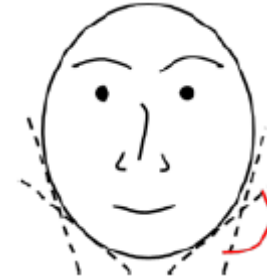
EXAMPLE 2

Correlation among plural training data

Specification

- Feature that expresses shape of face

face line angle

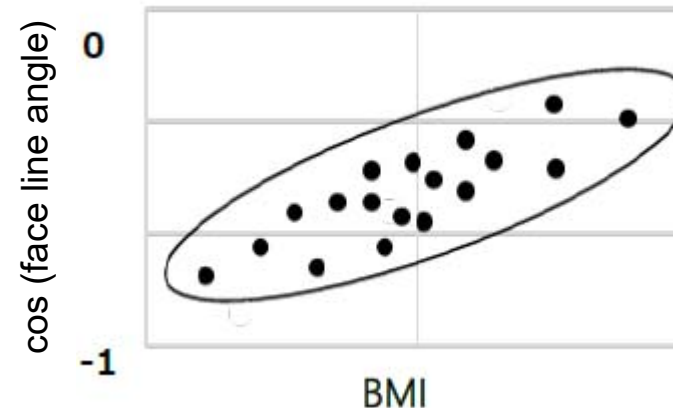


- Statistically significant correlation between BMI and cos (face line angle)

(such correlation was not previously known)

$$BMI(\text{Body Mass Index}) = \frac{\text{weight (kg)}}{(\text{height(m)})^2}$$

- Other features that expresses shape of face may be used



EXAMPLE 2

Correlation among plural training data

Claim 1

Rejected!!

Lack of written description
Not satisfying enablement requirement

Training Data

- Height
- Weight
- Feature that expresses shape of face

Claim 2

Allowed!!

Written description OK
Enablement requirement satisfied

Training Data

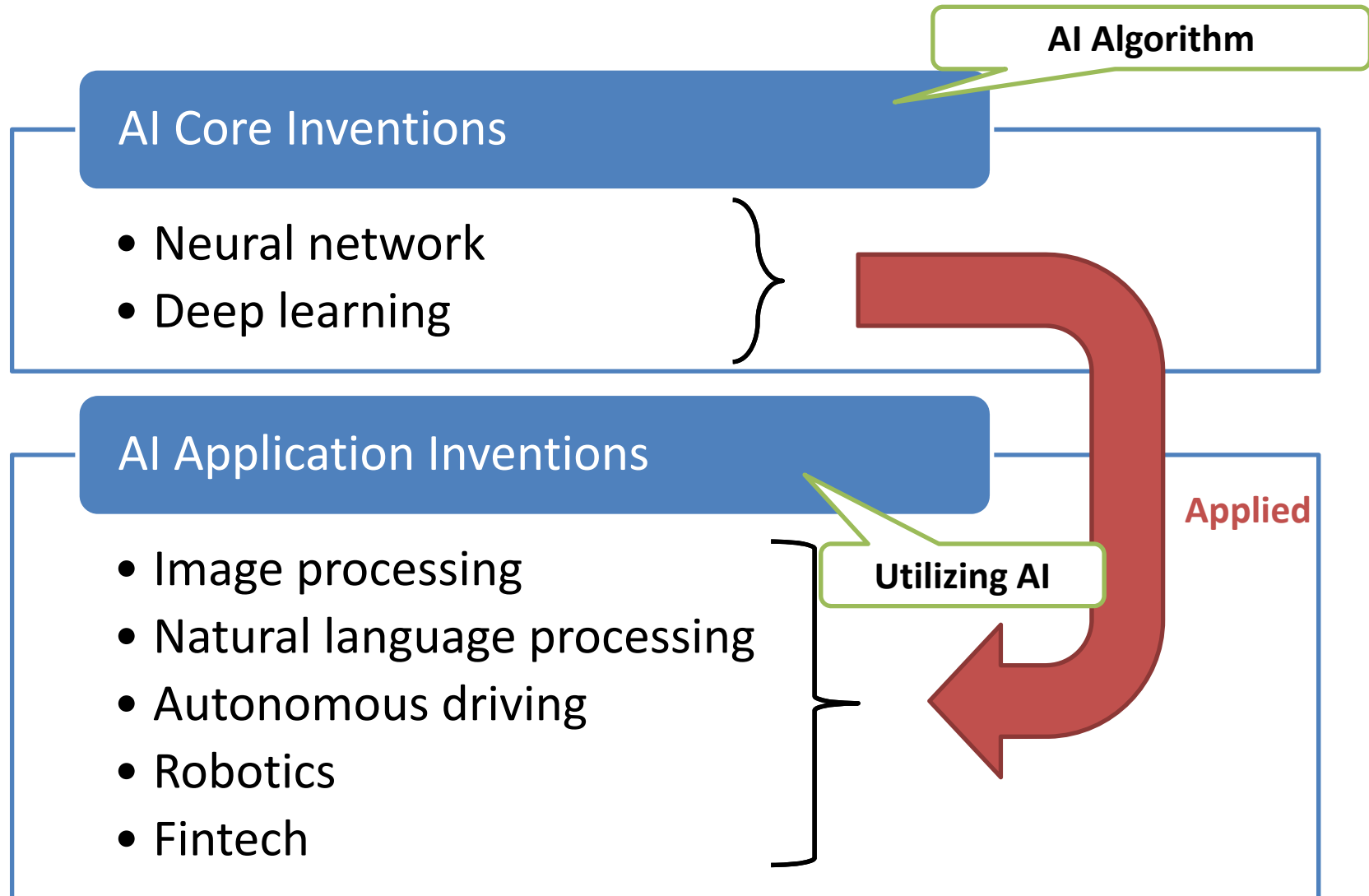
- Feature that expresses shape of face

LIMITED TO

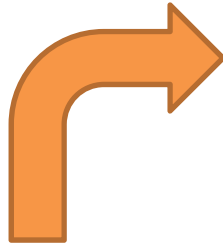
face line angle



AI-related inventions



AI-related inventions



Parameters obtained by trained AI model
In the field of chemistry/material
science/pharmaceutical
= **Materials Informatics**

AI Application Inventions

- Image processing
- Natural language processing
- Autonomous driving
- Robotics
- Fintech

Utilizing AI

EXAMPLE 3

Composition predicted by AI to have a certain feature

Claim 1 An anaerobic adhesive composition comprising:

0.08-3.2 wt% of compound A,

0.001-1 wt% of compound B, and

anaerobically curable (meth)acrylate monomer,

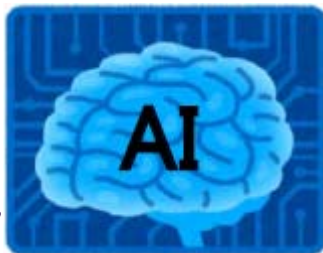
wherein the adhesive composition shows more than 30% cure extent of 24-hour curing strength within 5 minutes.

EXAMPLE 3

Composition predicted by AI to have a certain feature

Training Data

- Composition data of anaerobic adhesive composition
- Curing strength data after 5 minutes
- Curing strength data after 24 hours



Learning...



Q: What is the composition of anaerobic adhesive that would show more than 30% cure extent?

A: Composition including:
Compound A xx%
Compound B xx%

No experiment of production/curing strength



EXAMPLE 3

Composition predicted by AI to have a certain feature

Rejected!! (lack of written description)

- No experimental data
- Prediction accuracy of the trained model not verified
- No common general technical knowledge that the results predicted by the trained model can replace actual experimental results

Rejection cannot be overcome by later submitting experimental results of actual production and measurement of the anaerobic adhesive composition, affirming the prediction by the trained model (AI).

Comparative Study on Computer Implemented Inventions/Software Related Inventions (2018)

- EPO and JPO
- Two Requirements
 - (1) claimed invention must be a statutory “invention”
 - (2) claimed invention must be novel and involve an inventive step

Inventive Step in Computer Implemented Inventions/Software Related Inventions

NON-TECHNICAL FEATURES

EPO

- All the non-technical features which do not contribute to the technical character of the invention are not taken into account when assessing inventive step.

JPO

- During the inventive step assessment, no distinction is made between features which are technical and non-technical.

EXAMPLE 4

Inventive Step Judgement on Claims Including Non-Technical Features

A computer-implemented method for brokering offers and demands in the field of transporting freight



EXAMPLE 4

Inventive Step Judgement on Claims Including Non-Technical Features

[Claim 1]

A computer-implemented method for brokering offers and demands in the field of transporting freight, comprising the following steps:

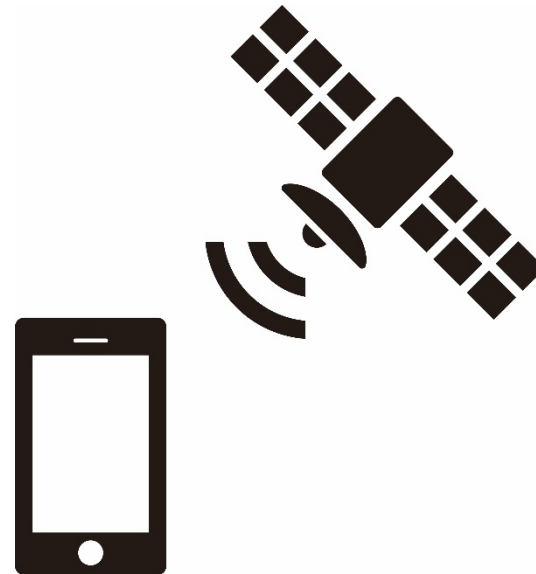
- (a) receiving transportation offers/demands from users, including location and time data;
- (b) receiving current location information of the users from GPS terminals with which the users are equipped;
- (c) after receiving a new offer/demand request, verifying if there are previous offers/demands not yet satisfied that can respond to the new request;
- (d) if so, selecting the one for which the current locations of both users are closest; and
- (e) otherwise storing the new request.

EXAMPLE 4

Inventive Step Judgement on Claims Including Non-Technical Features

[State of the art (Prior art, well-known art)]

A method of order management in which a server computer receives location information from GPS terminals.



Inventive Step in Computer Implemented Inventions/Software Related Inventions

EPO

NO INVENTIVE STEP = REJECTED!!

- Brokering offers and demands is a typical business activity = non-technical feature

JPO

INVENTIVE STEP = ALLOWED!!

- No prior art discloses/suggests a specific method of order management except that a server computer receives location information from GPS terminals.

SUMMARY

- Patent grant rate is high (incl. AI-related).
- New claim category allowed
- Correlation among training data is important.
- In materials informatics inventions, results obtained by using AI must be tested.
- Non-technical features are taken into consideration to judge inventive step in Japan.

Thank you!!

Shuichi Shitara

 Taiyo, Nakajima & Kato