AI and Data Science Activities in SoftBank Corp.

SoftBank

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Background

Softbank has a wealth of data which is growing ever larger daily

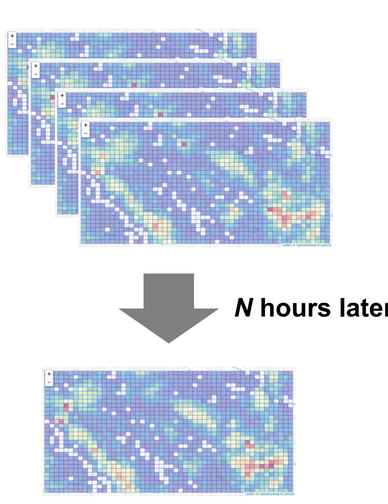
- Data of tens of million of customers
- Activity of customers (Visits to physical stores, My Softbank usage, Questionnaire data, etc.)
- Large number of base stations and cell towers, wifi spots

Utilizing data from these sources, we deliver novel solutions to our customers

Data Lake

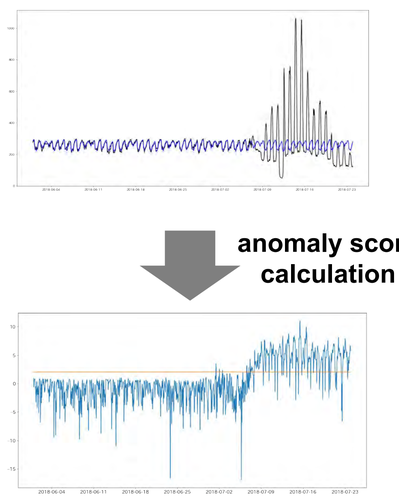
Collecting data from a variety of sources and storing it in a data warehouse which we call Data Lake
Conduct analysis and make data-driven decisions using accumulated data

Geolocation



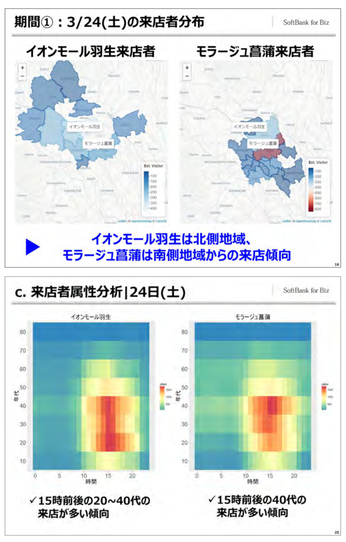
N hours later

floating population prediction

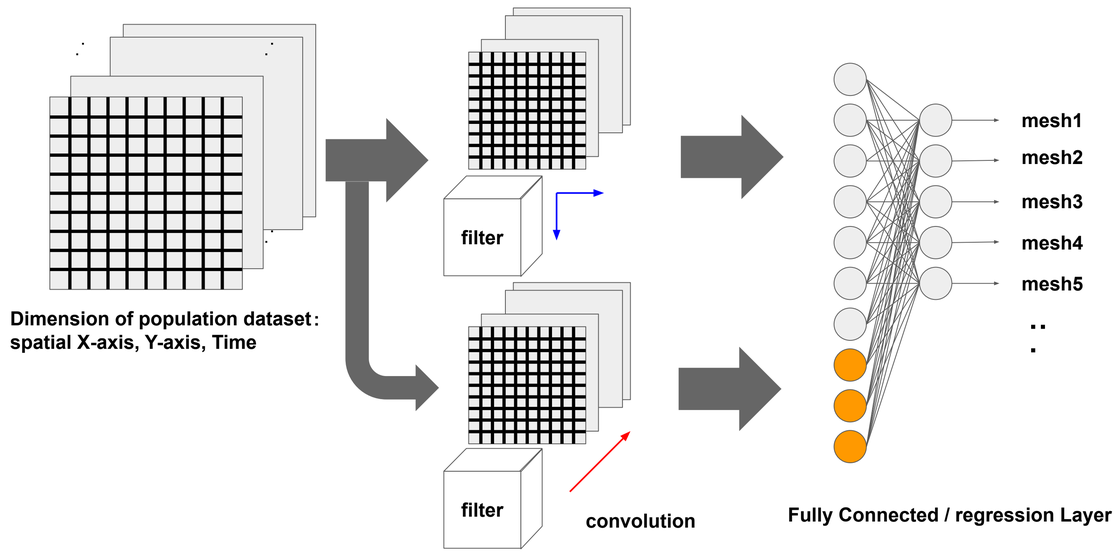


anomaly score calculation

anomaly detection



sight-seeing/shop visit analysis



floating population prediction using CNN

Location data collected by base stations and cell towers are used in
- **floating population prediction**
- **anomaly detection**
- **sight-seeing/shop visit analysis etc...**

We use Convolutional Neural Networks to analyze location data

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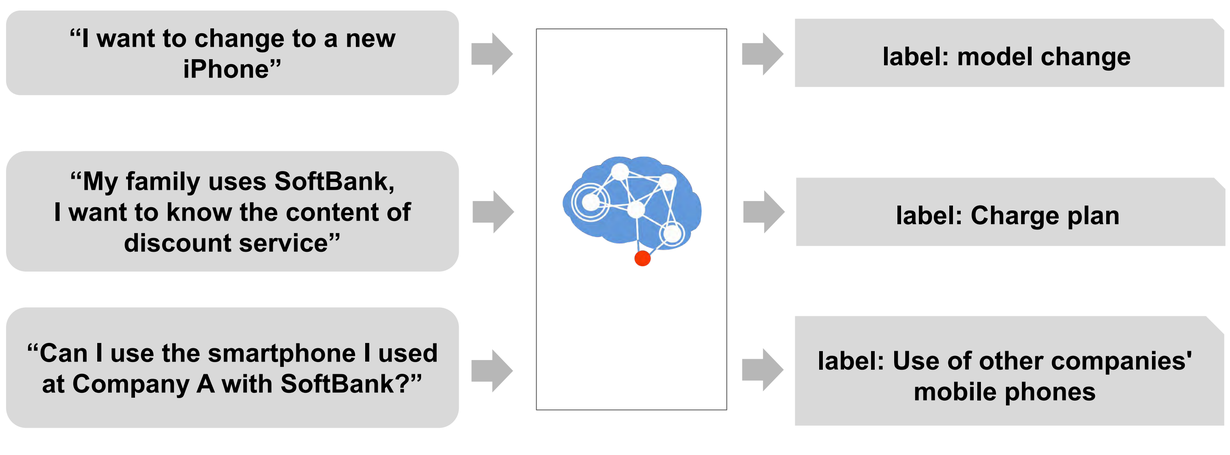
In Softbank's day-to-day business, we are faced with a large amount of natural language data in the following areas:

- **Customer service center**
- **Intranet help services**
- **Questionnaire, surveys, etc.**

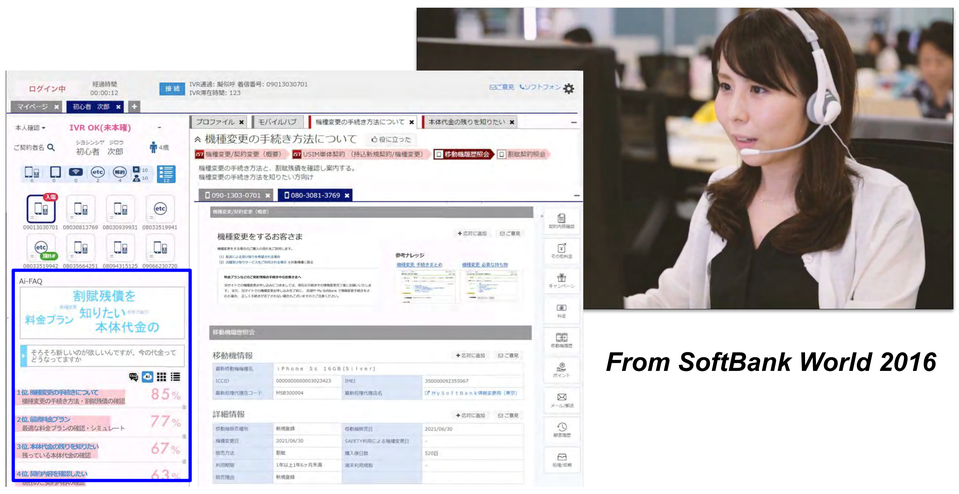
By exploiting NLP, we can transform our business and increase efficiency

Text classifier



We are developing in-house text classifier web application which enables training and inference of machine learning models via REST APIs.

Q&A system



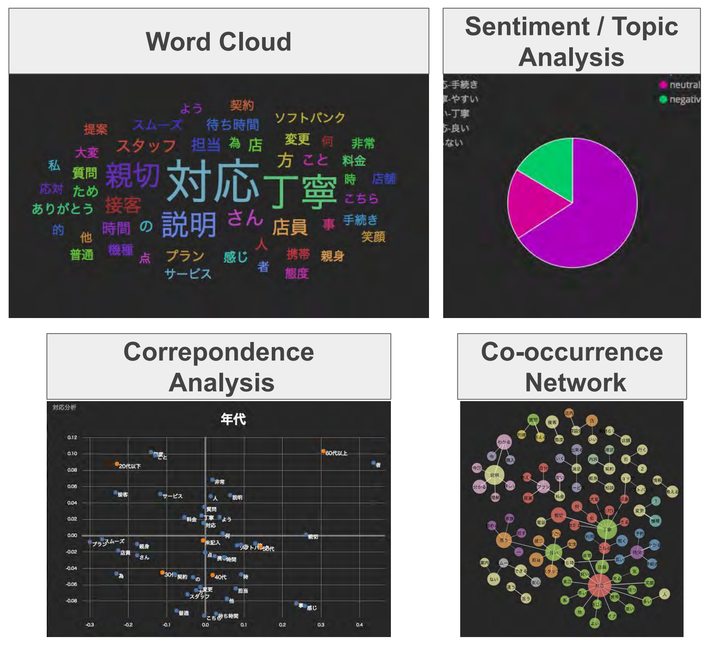
From SoftBank World 2016

Automatic Q&A System called "AI-FAQ" is used in our call centers. AI-FAQ predicts the crux of the customer's problem based on voice data and assists the operator in answering the query by guiding the operator to relevant help pages.

Chatbot

We provide chat support service, in which a chatbot answers customers' questions. If customers are able to find answers to their questions themselves, we can reduce the time and cost of operators responding to the questions.

Text mining engine



We use in-house applications to analyze large amounts of text data. Even people who are not familiar with analytical methods can perform the following analysis.

- **Frequent / co-occurrence words**
- **sentiment / topic analytics**
- **correspondence analytics**

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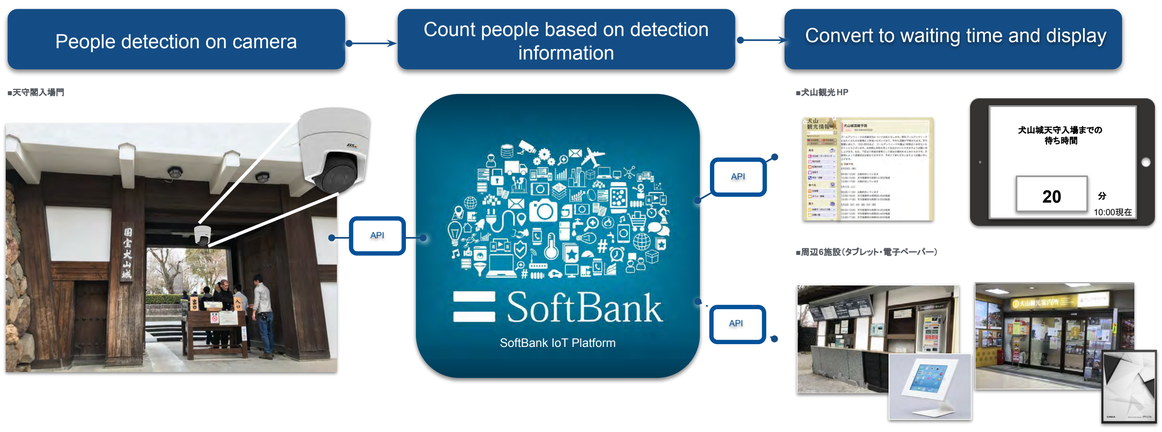
Computer vision is an important technological area for Softbank.
In particular, analysis of camera footage is a hot topic within IoT.
Through various experiments, we evaluate the feasibility of leveraging this technology in our business.

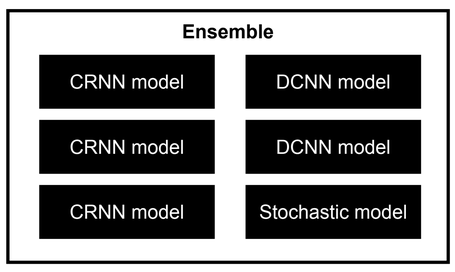
- **Image analysis (Counting people/facial recognition)**
- **Optical Character Recognition/Text analysis**
- **Object recognition**

Pedestrian count



Joint experiment with Inuyama City, Aichi Prefecture
Recognizes the entrance and exit of visitors to Inuyama Castle and automatically updates the congestion status

OCR



- **Generate characters using GAN based on a handwriting style Font**

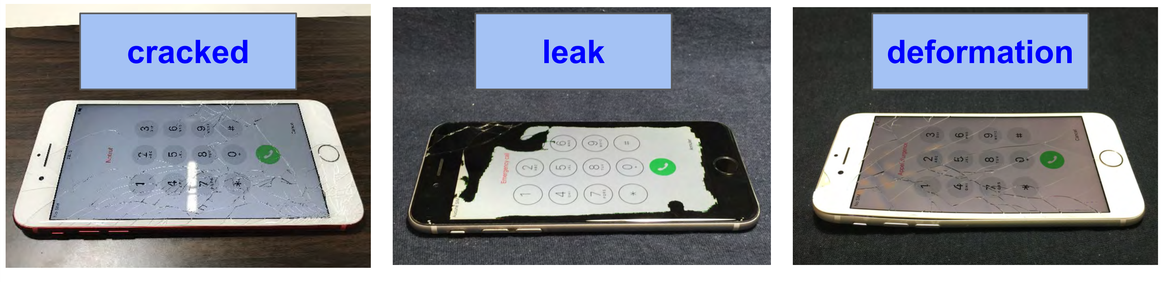
- **Generate characters using GAN based on handwriting**

There is a certain amount of analog documents that our staff must process. We are developing an OCR engine by combining multiple deep learning models

Image recognition

■ Broken iPhone classification

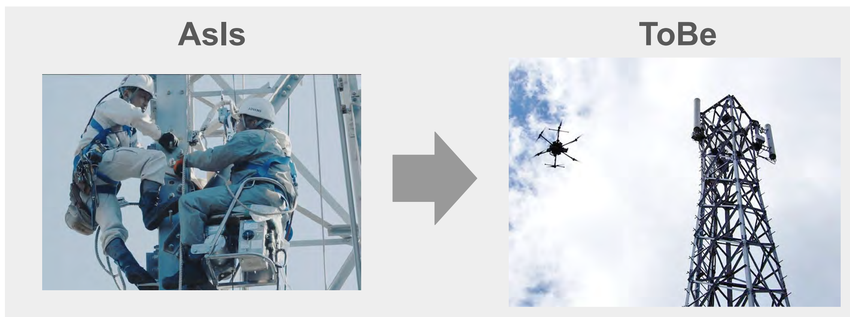
Broken iPhone classification : **over 90 % accuracy on test data**



We are experimenting with the automation of iphone purchase assessment and build a model to determine the following iphone conditions:

Cracked, Leak, Deformation

■ Automated Equipment Inspection



*Product image for illustration purposes only

We are testing whether image recognition can be used for automatic inspection of base station equipment.

key techniques:

segmentation, detection, classification