Machine Learning Cases Sharing

Tony Lin
idea → profit
Team Data Science Process

Start

Business Understanding

Data Acquisition & Understanding

Modeling

Deployment

Customer Acceptance

End

Feature Engineering
- Transform, Binning
- Temporal, Text, Image, etc.
- Feature Selection

Model Fitting
- Algorithms, Ensemble
- Hyper-parameter Tuning
- Retraining

Model Evaluation
- Cross Validation
- Model Reporting

Data Source
- On-Premises vs Cloud
- Database vs Files

Pipeline
- Streaming vs Batch
- Low vs High Frequency

Data Wrangling
- Structured vs Unstructured
- Data Validation and Cleanup
- Visualization

Analytics Environment
- On-Premises vs Cloud
- Database vs Data Lake vs...
- Small vs Medium vs Big Data

IoT in Action

Microsoft
Overview of Machine Learning Algorithms

**Regression**
How much? How many?

**Classification**
Which class does this belong to?

**Clustering**
Are there different groups? Which group does it belong to?

**Anomaly Detection**
Is this weird?

**Reinforcement Learning**
Which should I do?
Option 1 – Easy

idea → prebuilt AI → profit

IoT in Action

Microsoft
Cognitive Services

Infuse your apps, websites and bots with intelligent algorithms to see, hear, speak, understand and interpret your user needs through natural methods of communication
Vision
Image-processing algorithms to smartly identify, caption and moderate your pictures.

Knowledge
Map complex information and data in order to solve tasks such as intelligent recommendations and semantic search.

Language
Allow your apps to process natural language with pre-built scripts, evaluate sentiment and learn how to recognize what users want.

Speech
Convert spoken audio into text, use voice for verification, or add speaker recognition to your app.

Search
Add Bing Search APIs to your apps and harness the ability to comb billions of webpages, images, videos, and news with a single API call.
Selfies for Security

To safeguard against fraud and enhance both driver and rider peace of mind
End to End Workflow

Data Acquisition

Modeling

Deployment
Option 2 – Still Easy, but More Work

1. Idea
2. Customize prebuilt AI
3. Profit
Vision
Image-processing algorithms to smartly identify, caption and moderate your pictures.

Knowledge
Map complex information and data in order to solve tasks such as intelligent recommendations and semantic search.

Language
Allow your apps to process natural language with pre-built scripts, evaluate sentiment and learn how to recognize what users want.

Speech
Convert spoken audio into text, use voice for verification, or add speaker recognition to your app.

Search
Add Bing Search APIs to your apps and harness the ability to comb billions of webpages, images, videos, and news with a single API call.

Customization
- Custom Vision
- Custom Speech
- Language Understanding (LUIS)
- Custom Decision
- Bing Custom Search

IoT in Action

Steel Surface Inspection with Image Classification

To classify different kinds of defects with an automated way
End to End Workflow

Data Acquisition

<table>
<thead>
<tr>
<th>Nail</th>
<th>Scratch</th>
<th>Smear</th>
<th>Noise</th>
<th>Normal</th>
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</thead>
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Modeling

- Custom Vision
- ONNX

Deployment

- Windows Machine Learning

IoT in Action

Microsoft
在產業中鐵是個重要的材料
Option 3 – Hands Will be Dirtied

idea → custom AI → profit
Option 3

idea → data → experiment → model → deploy → profit

custom AI
AI Platform

Artificial Intelligence productivity for every developer and every scenario
The Microsoft AI platform: Azure & AI

Services

Infrastructure

Tools
Steel Surface Inspection with Object Detection

There are strong demands on detecting defects
End to End Workflow

Data Acquisition

Modeling

Deployment

ONNX

Windows Machine Learning
Robotic Arm Anomaly Detection

To identify the abnormal behavior of robotic arms with electric current motor sensor
End to End Workflow

Data Acquisition

Modeling

Deployment
Magic test box is a test machine for Windows devices.
Recap
Building your own AI models

Transforming data into intelligence

Prepare data ➔ Build and train ➔ Deploy
AI Services in Azure

Bringing the best of AI to Azure and the best of Azure to AI

Prebuilt AI
Cognitive Services

Customize Prebuilt AI
Custom Vision Service

Custom AI
Azure Machine Learning
Thank you