Technology and Data

ING, 07th May 2020
Dr. Shiler Khedri

Policy and the Rise of Data and Technology

Policy on regulating use of Technology and Data

- Protect individual right
- Improve ethical competence: e.g. bias, fairness, explainability and privacy-preserving ML
- Permission-less innovation
- Stimulate of economic growth
- Regulate competitive market and etc.

Policy through use of

Technology and Data

- Real time policy adaptation
- Deliver effective and efficient high-quality services
- Cultivate integrity and equality
- Define, predict and Mitigate risk and etc.

ING

Technology and Data in Policy Making

Machine learning and big data have gained major traction in economics and quantitative social sciences. They go hand in hand and enable many new insights in these discipline.

The use of data and technology such as basic components of a learning system are not fundamentally new. The novelty lies in the type of relations that can be modelled. Additionally, an increasing quantity of micro or high-frequency data are becoming available to policy makers. Availability of wide range data and technology enables policy makers to also focus on prediction problems in addition to casual questions used often for policy making.

Machine learning in UK financial services October 2019

Machine Learning for Public Policy Making, Erasmus Mundus Master's in Public Policy 2018

ING

Data and Technology Eco-system

Business system	Web Services	API Endpoints	Batch Scoring	...	Customer/User Interaction

Analytics Exploration

External APIs	
CI/CD4ML	Model acceptance
Active Learning	Quality Assurance
Privacy Preserving ML	Model validation
Resource management	Online Learning	ML pipeline management
Access management	Manual parameter tuning	Model visualisation
Feature extraction	Model development	Model Evaluation
Feature combination	AutoML	Model interoperability
Feature analysis	Domain Adaptation	Model debug

Feature engineering	Model training	Model debugging

Model →

Production Pipeline

Model Wrapper	Model Repository
Image builder	Configuration management

Model →

Streaming Platform

Kafka	Flink

Analytics Exploitation

	CI/CD4ML	ML pipeline management
ML Pipeline Versioning	User Interaction Logging	
Data Versioning	Resource management	UI/ BI
Model Versioning	Model Lineage	Online Evaluation
Resource estimation	Model fairness Estimator	Model Explainer
HA design	Service exposure	A/B test
Scalable model deployment on Kubernetes	Service monitoring	Gated launch
Model deployment	Model monitoring	Recycling of feedback data

Production process	Estimation process	Experimental process

↑ Survey data   **↑ Core development plan**   **↑ Production data**   **↑ Feedback data**

Data preparation	Feature Storage	Metadata management	Data Lineage	Data quality	Access Control	Data Dictionary
Data labeling	Data Versioning	Data cleaning	Data conversion	Data slicing	Data storage	Data Ingestion ETL/storage

System of Record format

Governed Data

System of Record

Business Purpose

Information Ingestion	Operational History	Information Warehouse	Data Mart

SQL → E → XFB → L → T → T → T