Introduction to Machine Learning on Azure

Francesca Lazzeri, PhD

@frlazzeri
aka.ms/AzureMLGithub
medium.com/@francescalazzeri

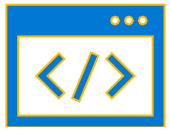
Agenda

What is Machine Learning?

When is Machine Learning (ML) the right tool?

How Azure Machine Learning tools will make your life easier

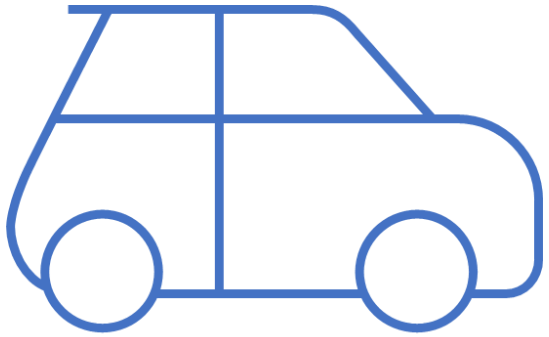
Build a model with no code using Azure ML designer



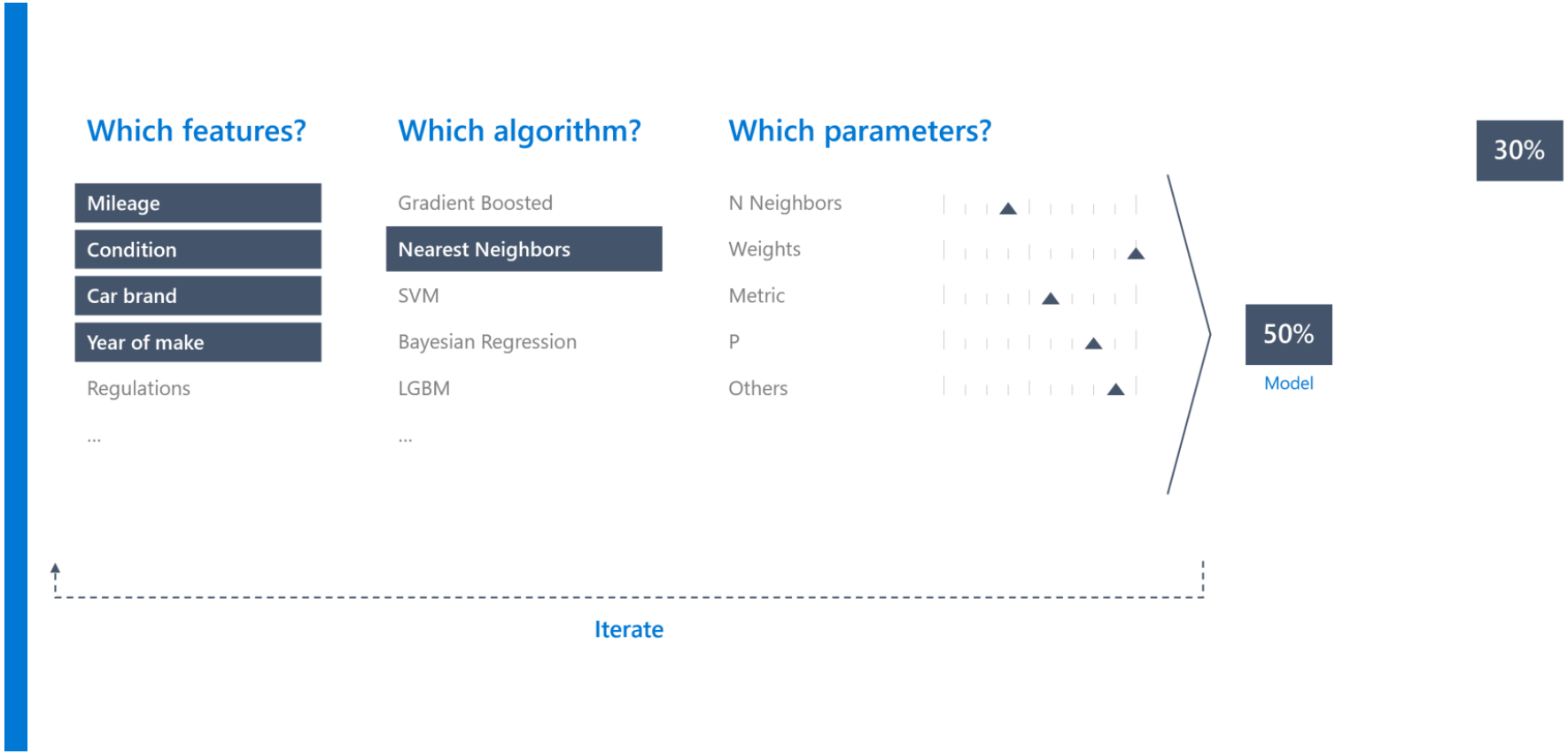
Test, deploy and consume the model

Use Case: Use regression to predict car prices

@frlazzeri



How much is this car worth?



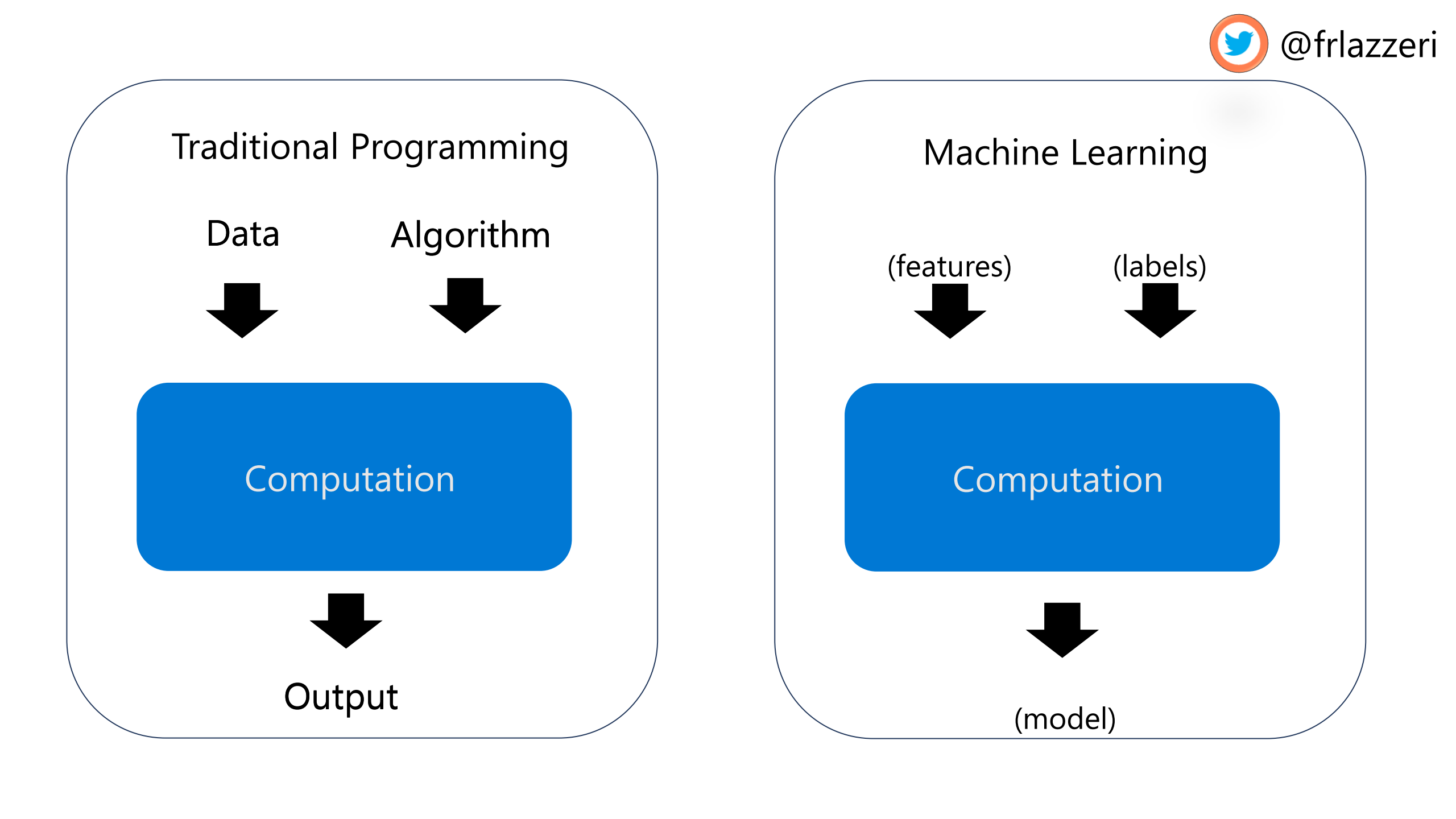
What is Machine Learning?

What is AI, ML and DL?

@frlazzeri

- **Artificial intelligence (AI)** is a technique that enables computers to mimic human intelligence. It includes machine learning.
  - **Machine learning (ML)** is a subset of artificial intelligence that includes techniques (such as deep learning) that enable machines to improve at tasks with experience.
    - **Deep learning (DL)** is a subset of machine learning based on artificial neural networks that permit a machine to train itself.

www.aka.ms/DeepLearningVSMachineLearning


@frlazzeri
Traditional Programming
Data
Algorithm
Computation
Output
Machine Learning
(features)
(labels)
Computation
(model)

When is Machine Learning the right tool?

@frlazzeri

When should you use machine learning?

supervised learning

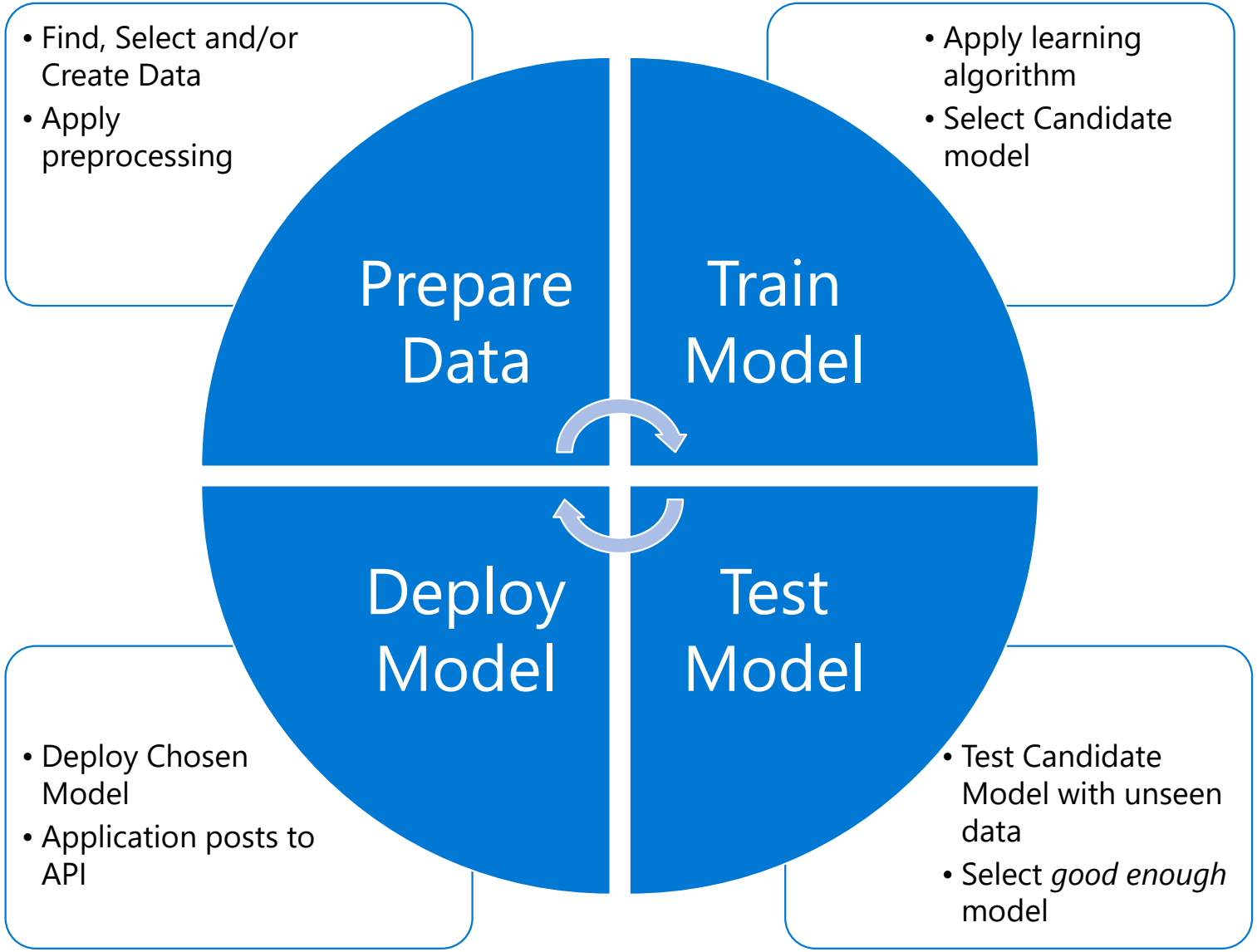
- Regression: how much / how many
- Classification: which class does it belong to?

unsupervised learning

- Clustering: are there different groups? Which does it belong to?
- Anomaly Detection: is this weird?
- Recommendation: which option should I choose?

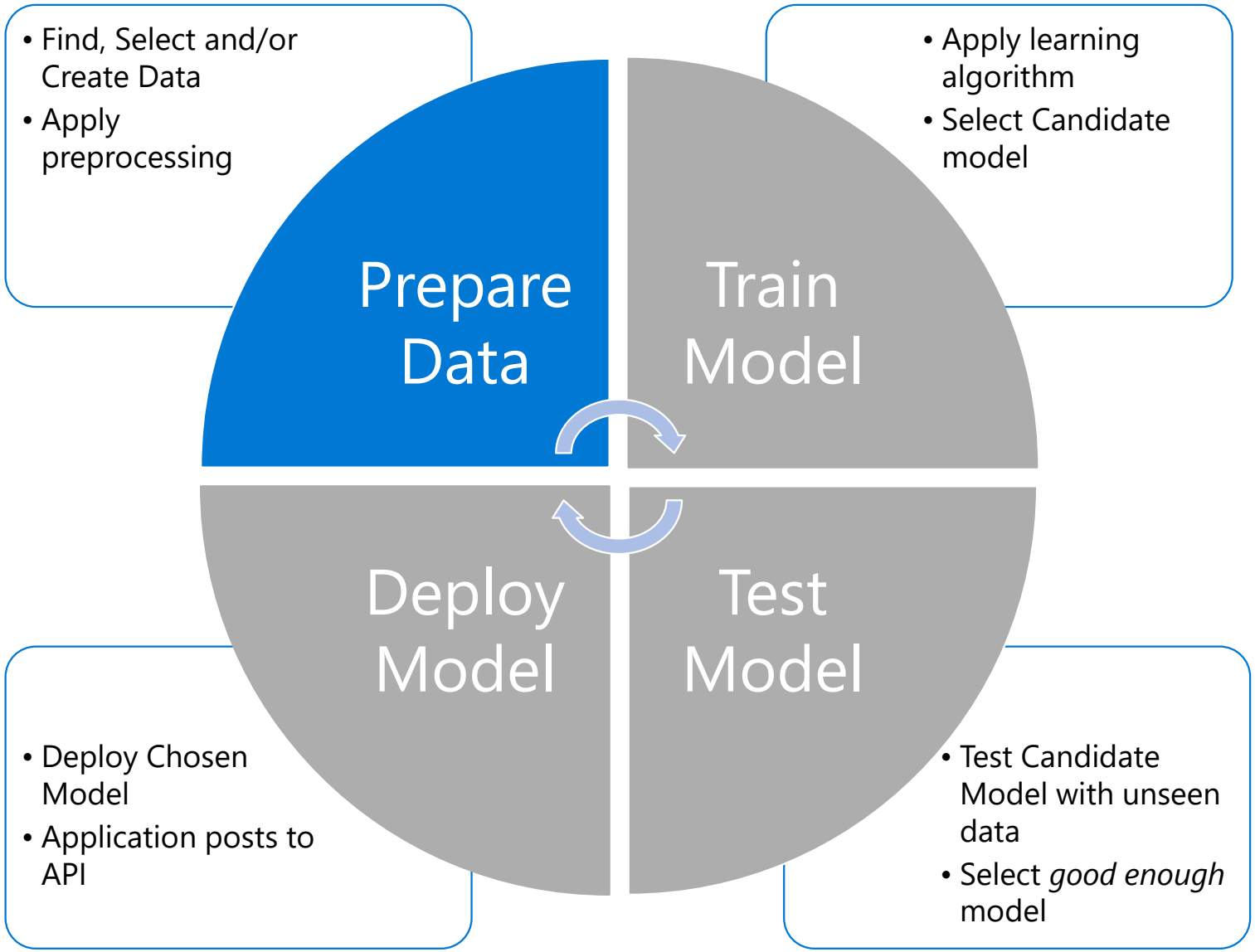
The Model Building Process

@frlazzeri



The Model Building Process

@frlazzeri

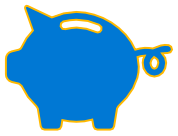


Prepare Data

Find Features and Process Data

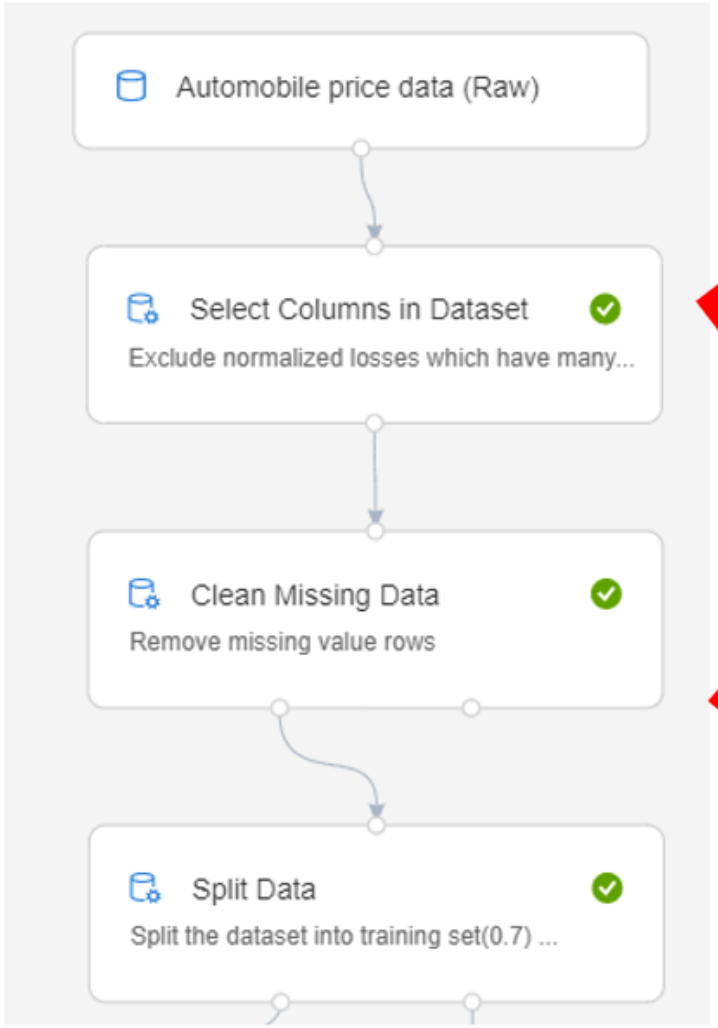
@frlazzeri

Select Columns in Dataset



Clean Missing Data

Split Data



Select Columns in Dataset

Parameters | Outputs | Logs | Details

Select columns * Edit column

All columns
Exclude column names: normalized-losses

Clean Missing Data

Columns to be cleaned * Edit column

All columns

Minimum missing value ratio *

0.0

Maximum missing value ratio *

1.0

Cleaning mode *

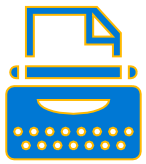
Remove entire row

Azure Machine Learning Service

A service that has all the tools needed to build, test and deploy amazing machine learning solutions – www.aka.ms/AzureMLservice

@frlazzeri

Azure Machine Learning Service



Authoring tools: Automated ML, Designer, Jupyter Notebooks and Files

Assets: Datasets, Experiments, ML Workflow Pipelines, Models, Deployments

Management: Compute, Datastores, Workspaces

Microsoft

@frlazzeri

Demo

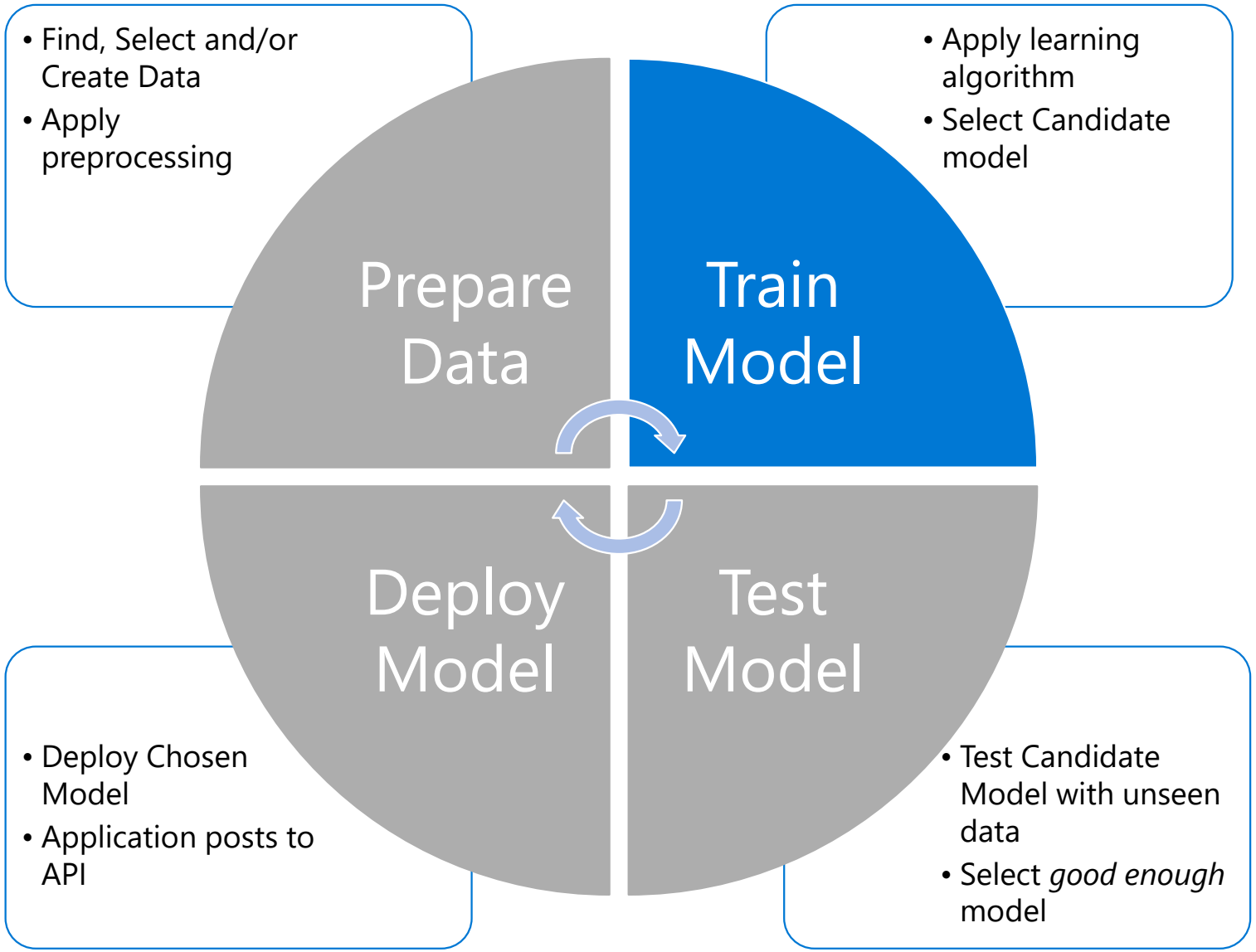
@frlazzeri

Train, Test & Deploy ML Models

Selecting the “Right” Algorithm to Train Your Model

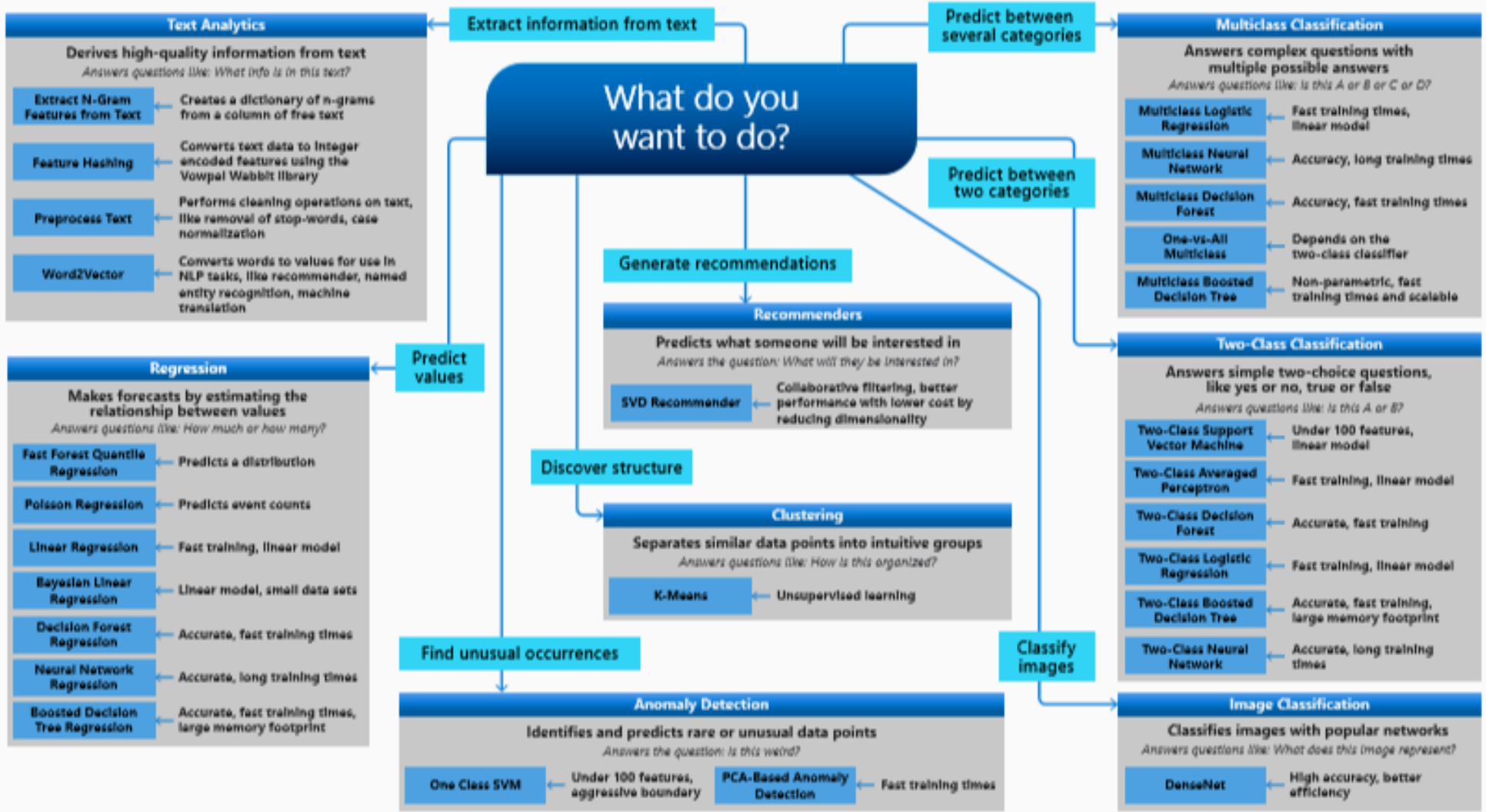
The Model Building Process

@frlazzeri



Microsoft Azure Machine Learning Algorithm Cheat Sheet

This cheat sheet helps you choose the best machine learning algorithm for your predictive analytics solution. Your decision is driven by both the nature of your data and the goal you want to achieve with your data.

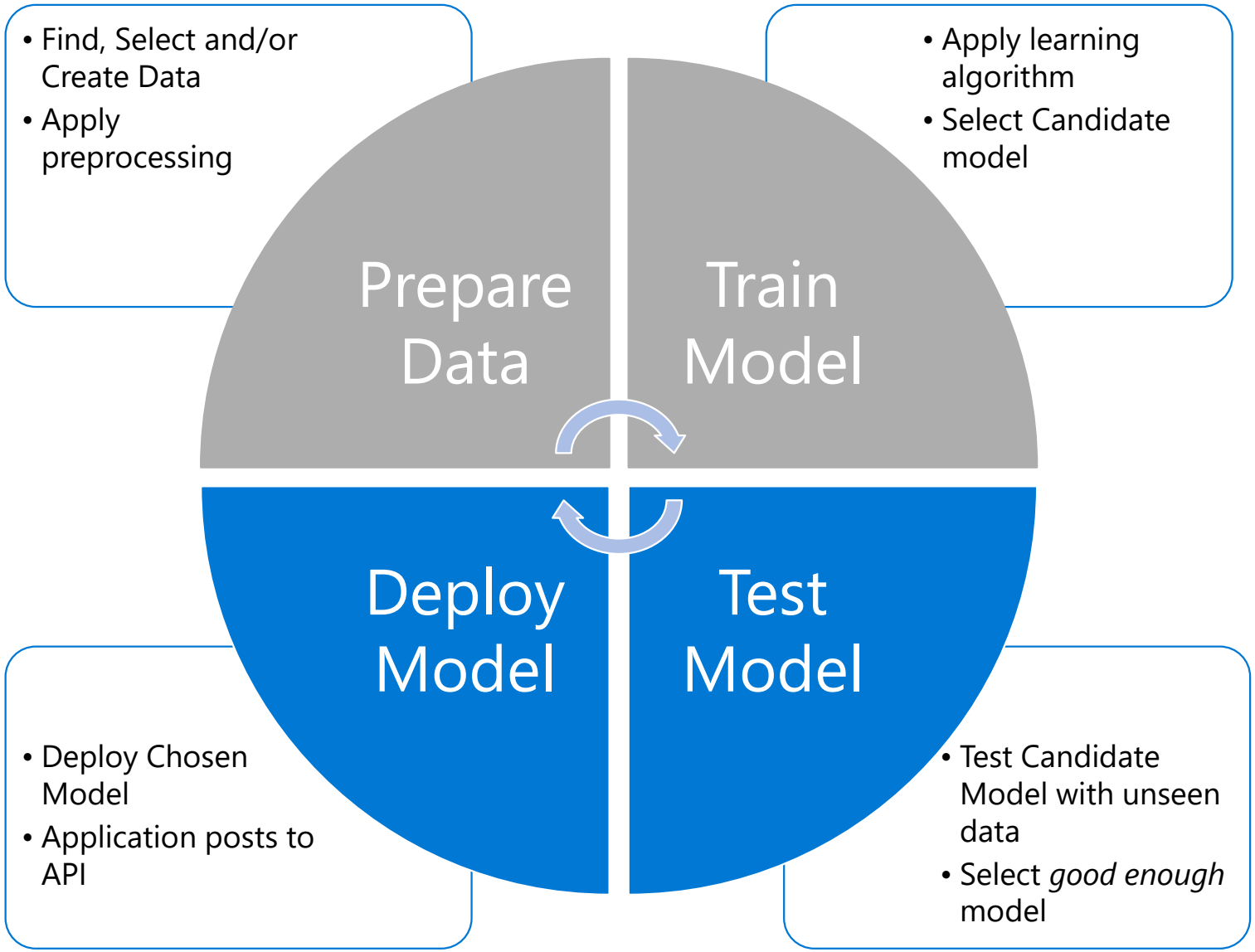


 Share this poster: aka.ms/mlcheatsheet

Microsoft

The Model Building Process

@frlazzeri



Microsoft

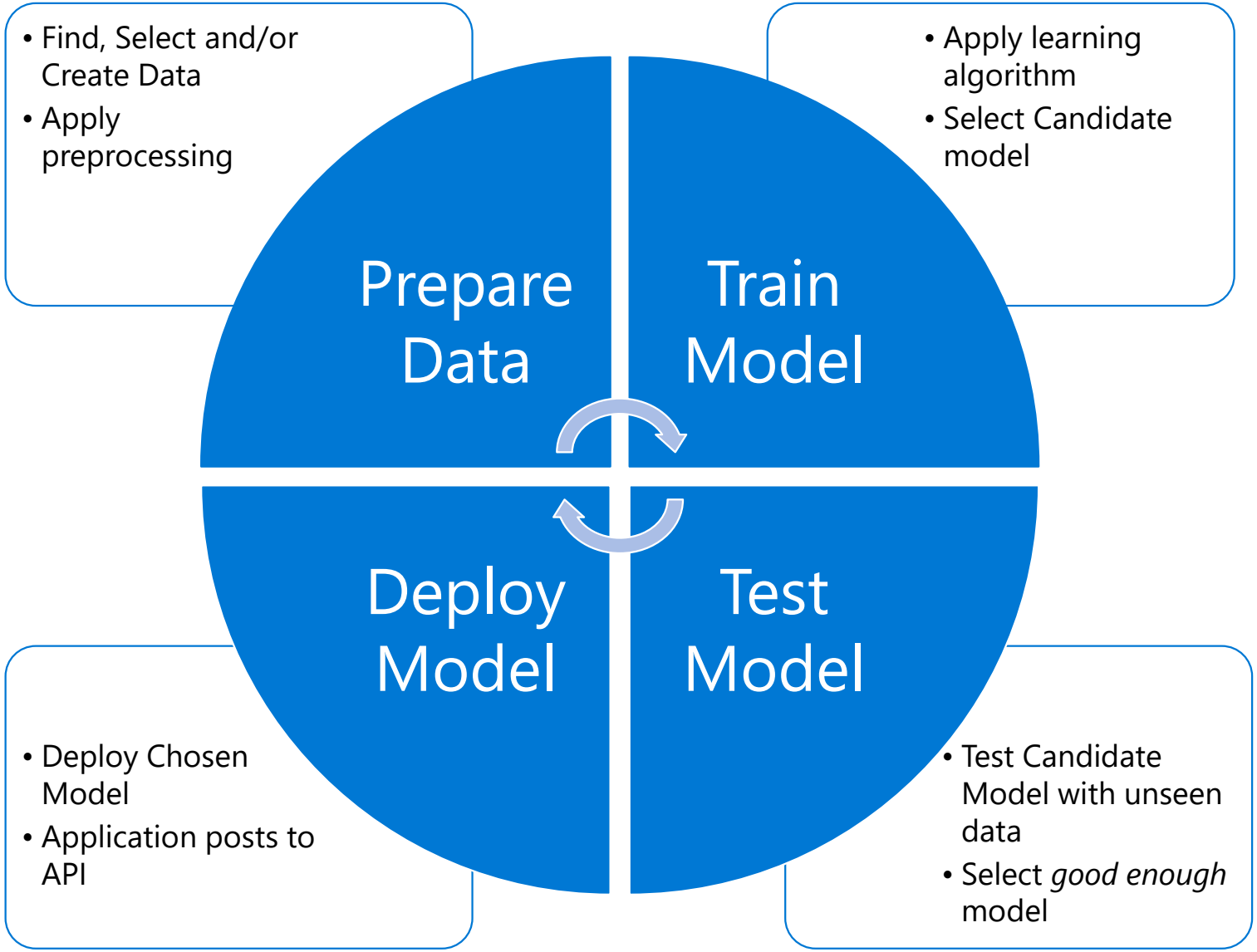
@frlazzeri

Demo

Conclusions

The Model Building Process

@frlazzeri



Resources

@frlazzeri

- www.aka.ms/AzureMLDoc
- www.aka.ms/AzureMLservice
- www.aka.ms/AzureMLdesigner
- www.aka.ms/DeepLearningVSMachineLearning
- www.aka.ms/AlgorithmCheatSheet
- www.aka.ms/SelectAlgos

Thank you!

Francesca Lazzeri, PhD

@frlazzeri
aka.ms/AzureMLGithub
medium.com/@francescalazzeri

Microsoft