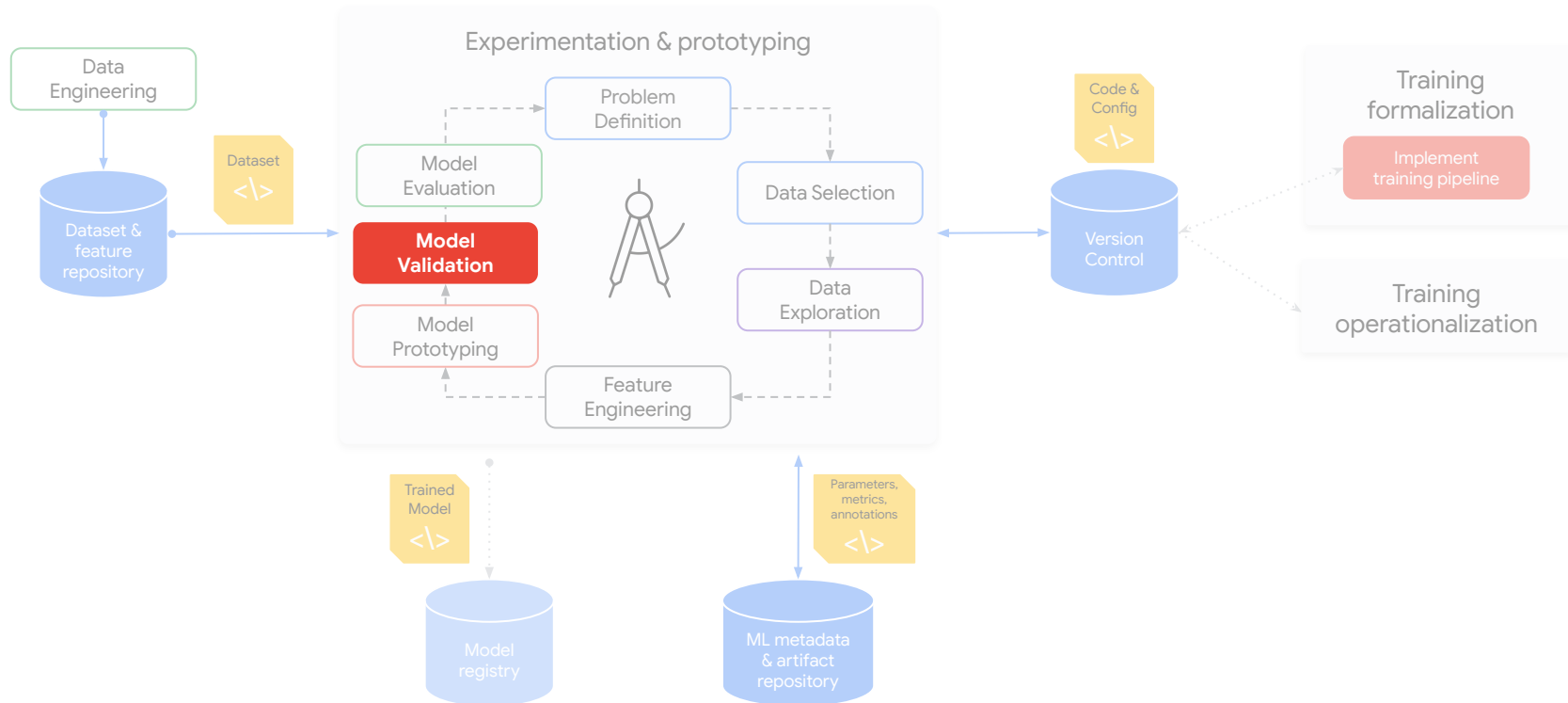


ML Development: Model Validation



MLOps: ML Development



The MLOps Personas



ML
Engineer



ML
Researcher



Data
Scientist



Data
Engineer



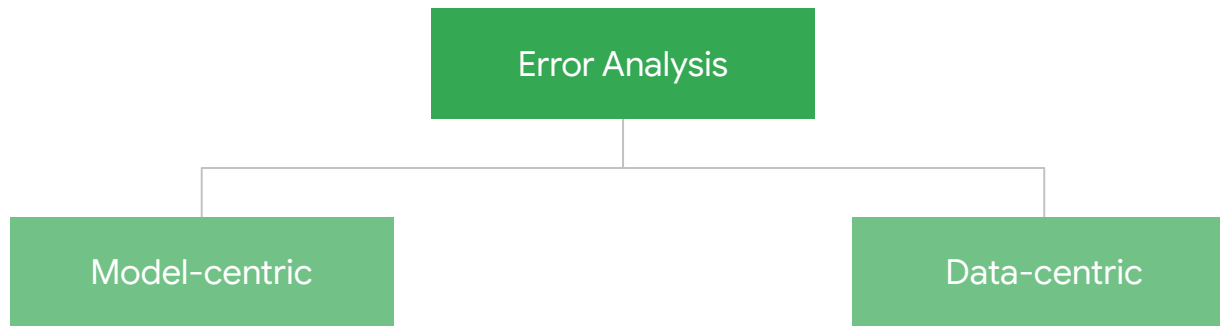
Software
Engineer



DevOps



Business
Analyst



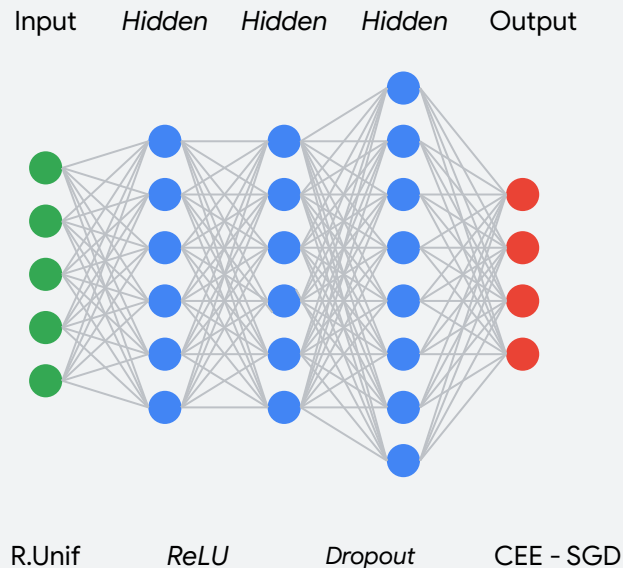
Model-centric Error Analysis

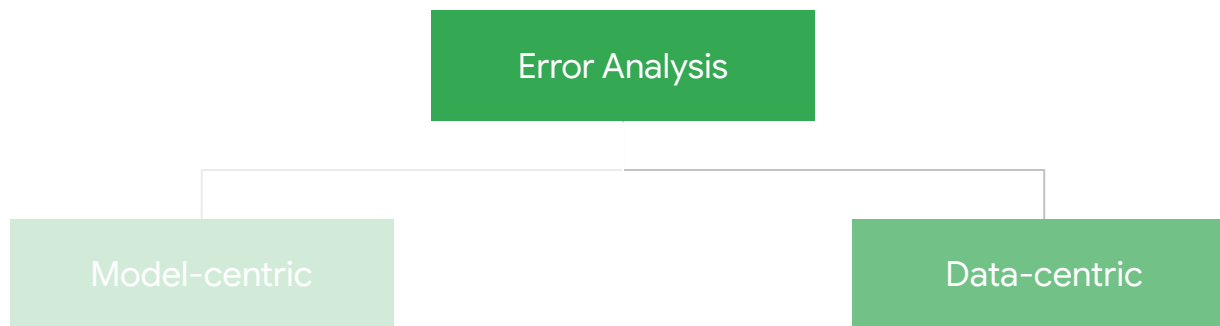
Model Design

- Weight initialization: Random Uniform
- Activation: ReLU
- Loss function: CEE
- Hidden layers: 3
- Units per layer: {p, p+1, p+1, p+3, 10}
- Optimizer: SGD
- Dropout layers, L_4

Hyperparameters

- Learning rate
- Batch size
- Dropout rate





Model Validation Methods

Training / Test **Split**

Leave-one-out
Cross-validation

Nested
Cross-validation

k-Fold Cross-validation

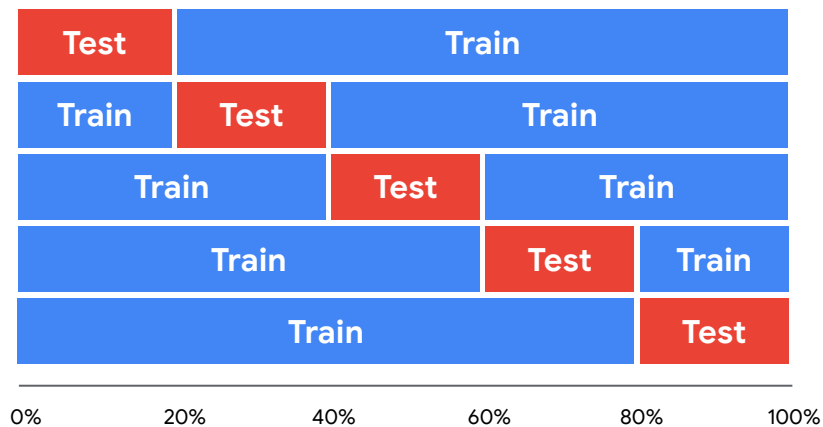
Leave-one-group-out
Cross-validation

Time-series
Cross-validation

Train/Test Splits



k-Fold Cross-Validation



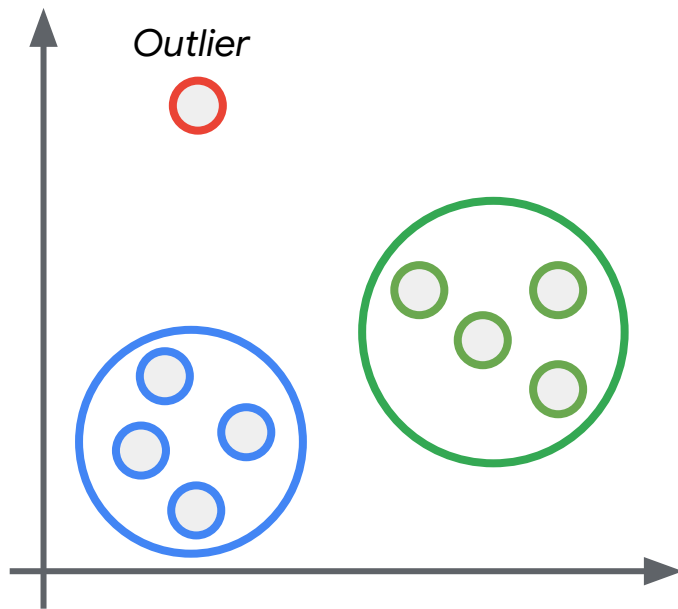
Leave-One-Out Cross-Validation



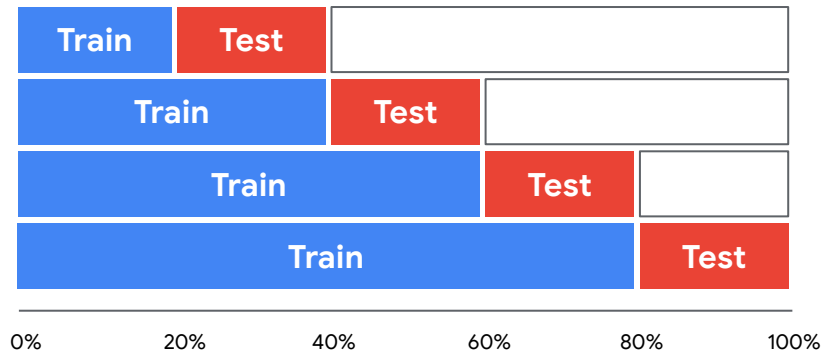
Leave-One-**Group**-Out Cross-Validation



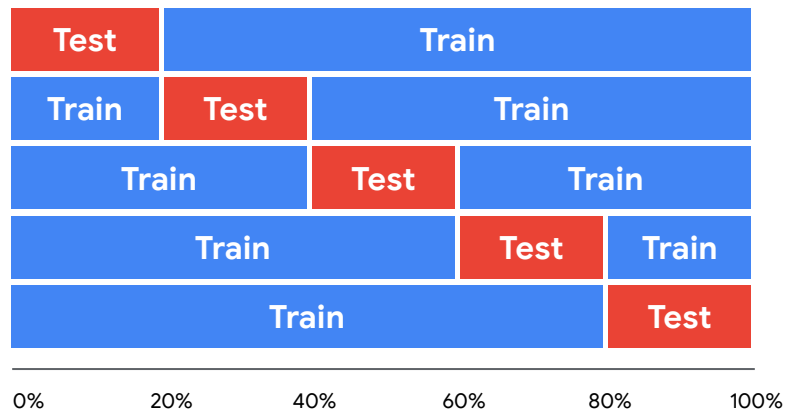
Anomaly Detection



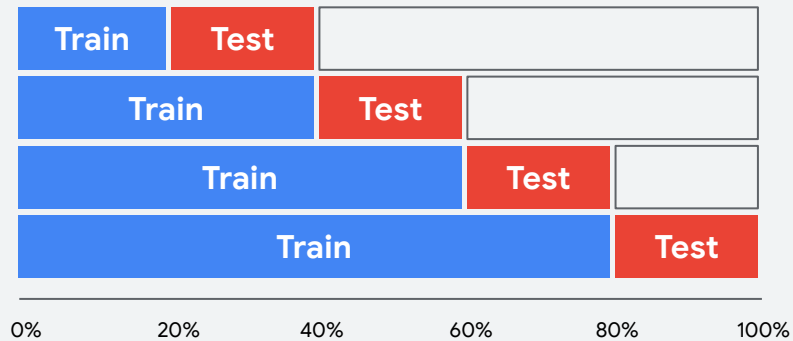
Time Series Cross-Validation

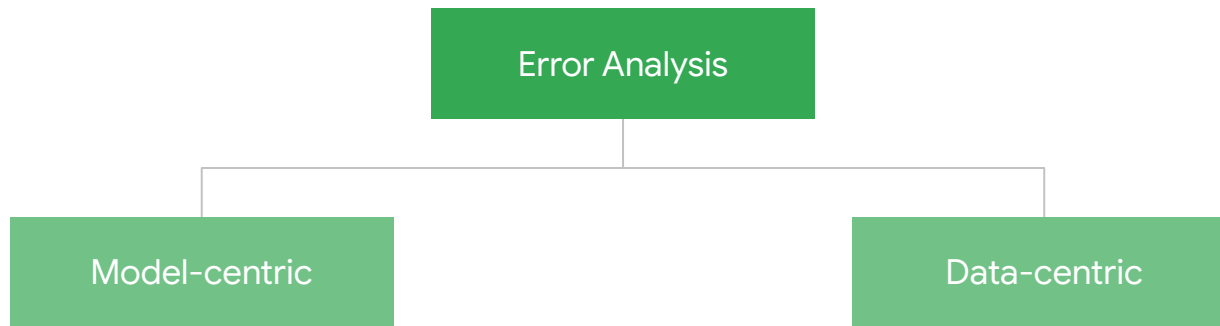


k-Fold



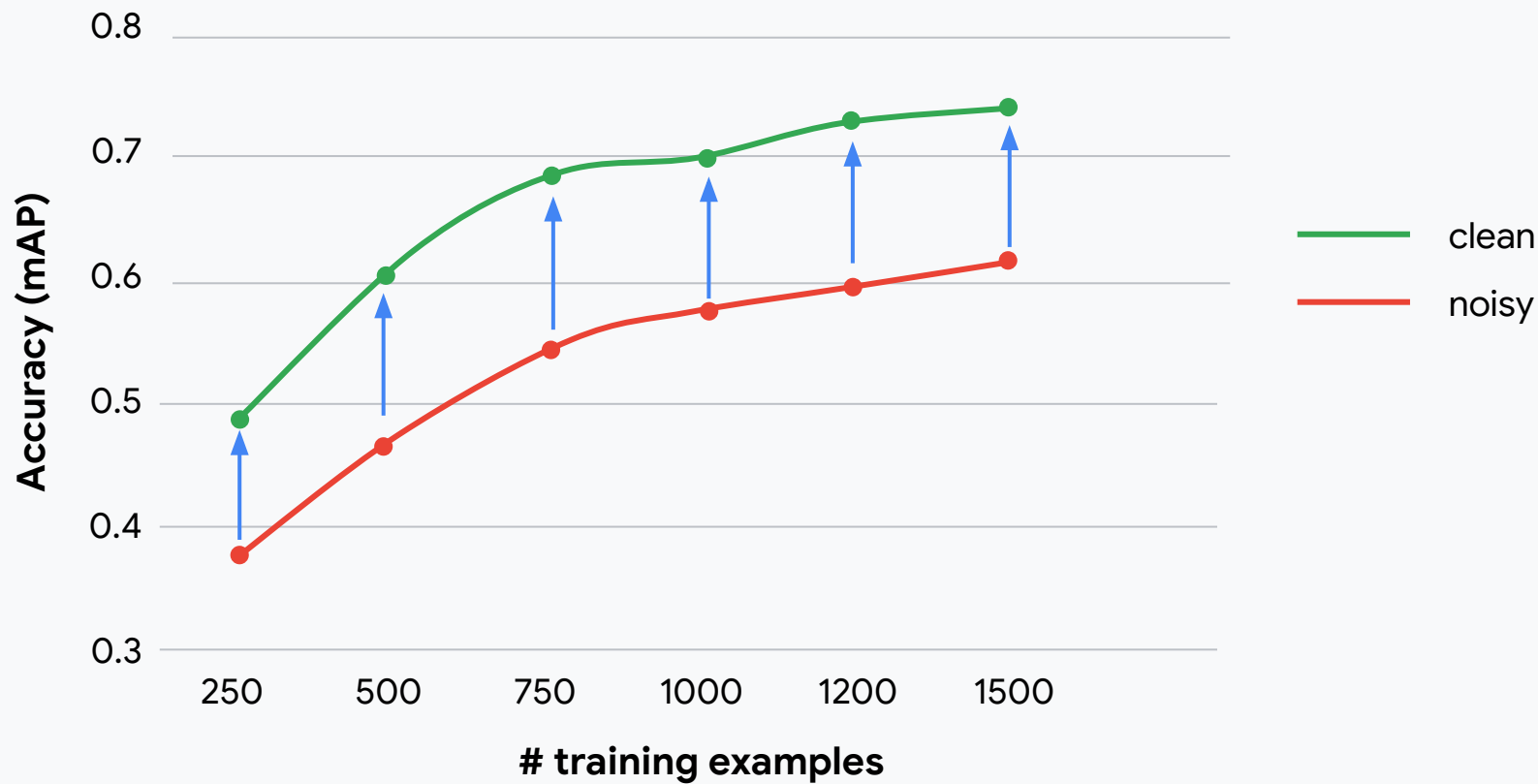
Time Series







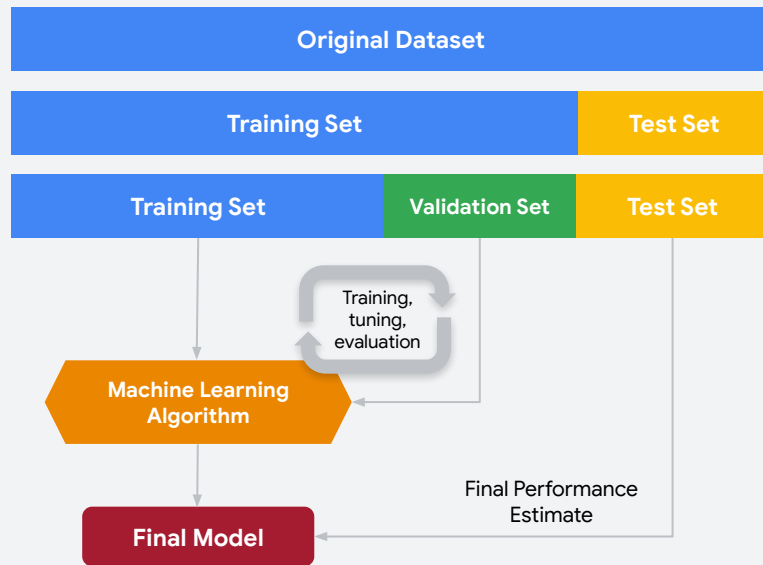
Credit: Andrew Ng



Credit: Andrew Ng

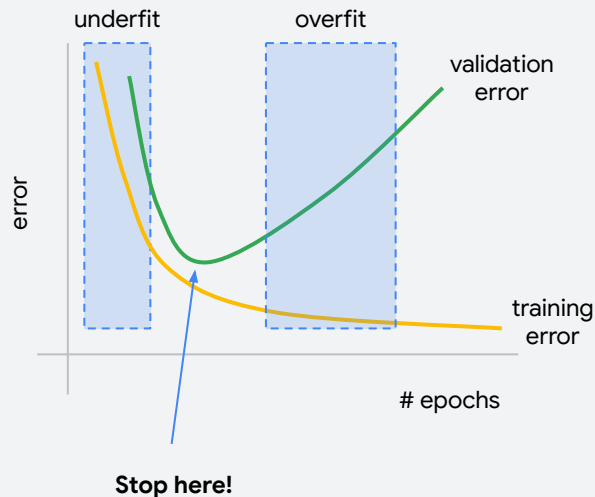
Data-centric Approach

- Analyze model errors on development set
- Apply data augmentation
- Improve false negative cases
- Conduct small and isolated experiments



Data-centric Approach

- **Analyze model errors on development set**
- Apply data augmentation
- Improve false negative cases
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DeepLearning.AI | LANDING AI

Data-Centric AI Competition

Join the data-centric AI movement!

[Click here to enter the contest!](#)



About the competition

A collaboration between DeepLearning.AI and Landing AI, the Data-Centric AI Competition aims to elevate data-centric approaches to improving the performance of machine learning models.

In most machine learning competitions, you are asked to build a high-performance model given a fixed dataset. However, machine learning has matured to the point that high-performance model architectures are widely available, while approaches to engineering datasets have lagged. The Data-Centric AI Competition inverts the traditional format and instead asks you to improve a dataset given a fixed model. We will provide you with a dataset to improve by applying data-centric techniques such as fixing incorrect labels, adding examples that represent edge cases, apply data augmentation, etc.

Contestants must submit their altered dataset for evaluation by September 4, 2021, 6PM PT (We picked this date because it is the birthday of John McCarthy, who had coined the term artificial intelligence!) The top three winners from each of the two categories (Best Performance Overall and Most Innovative) will be invited to a private event with Andrew Ng to share ideas about how to grow the data-centric movement, and will be highlighted in

Leaderboard

Rank	Submission	Accuracy
	Baseline	0.64421
	<i>DeepLearning.AI</i> (https://www.deeplearning.ai)	
1	iter3_002 <i>Divakar Roy</i> (https://www.linkedin.com/in/droyed/)	0.85826
2	baseline-cleaned-Naugmented <i>Innotescus</i> (https://innotescus.io/)	0.85744
3	syn-ann-sub_24 <i>Synaptic-Ann</i> (https://www.linkedin.com/in/nidhish-shah/) (https://www.linkedin.com/in/asfandyarazhar/)	0.85455
4	syn-ann-sub-21-gray <i>Synaptic-Ann</i> (https://www.linkedin.com/in/nidhish-shah/) (https://www.linkedin.com/in/asfandyarazhar/)	0.85083
5	jktubs_98_20_10_Edge <i>Jens Kramer</i> (https://www.linkedin.com/in/jens-kramer-	0.84959

Data-centric Approach

- Analyze model errors on development set
- Apply data augmentation
- **Improve false negative cases**
- Conduct small and isolated experiments

	Actual Yes	Actual No
Predicted Yes	True Positive	False Positive
Predicted No	False Negative	True Negative

Data-centric Approach

- Analyze model errors on development set
- Apply data augmentation
- Improve false negative cases
- **Conduct small and isolated experiments**

Error

Blurry images

Image defects in corners

High false positive rate

Experiment

→ Add random blur

→ Random crop

→ Increase confidence threshold

