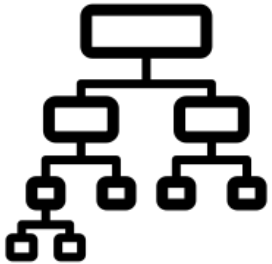
Challenges in adopting AI in Healthcare and ways to address them
– *seen by a data scientist*

While AI is making significant progress, challenges refraining its adoption in Healthcare persist

Presence of bias in the data

Trade-off between Accuracy & Interpretability



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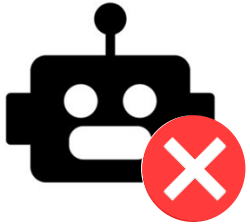

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defining AI

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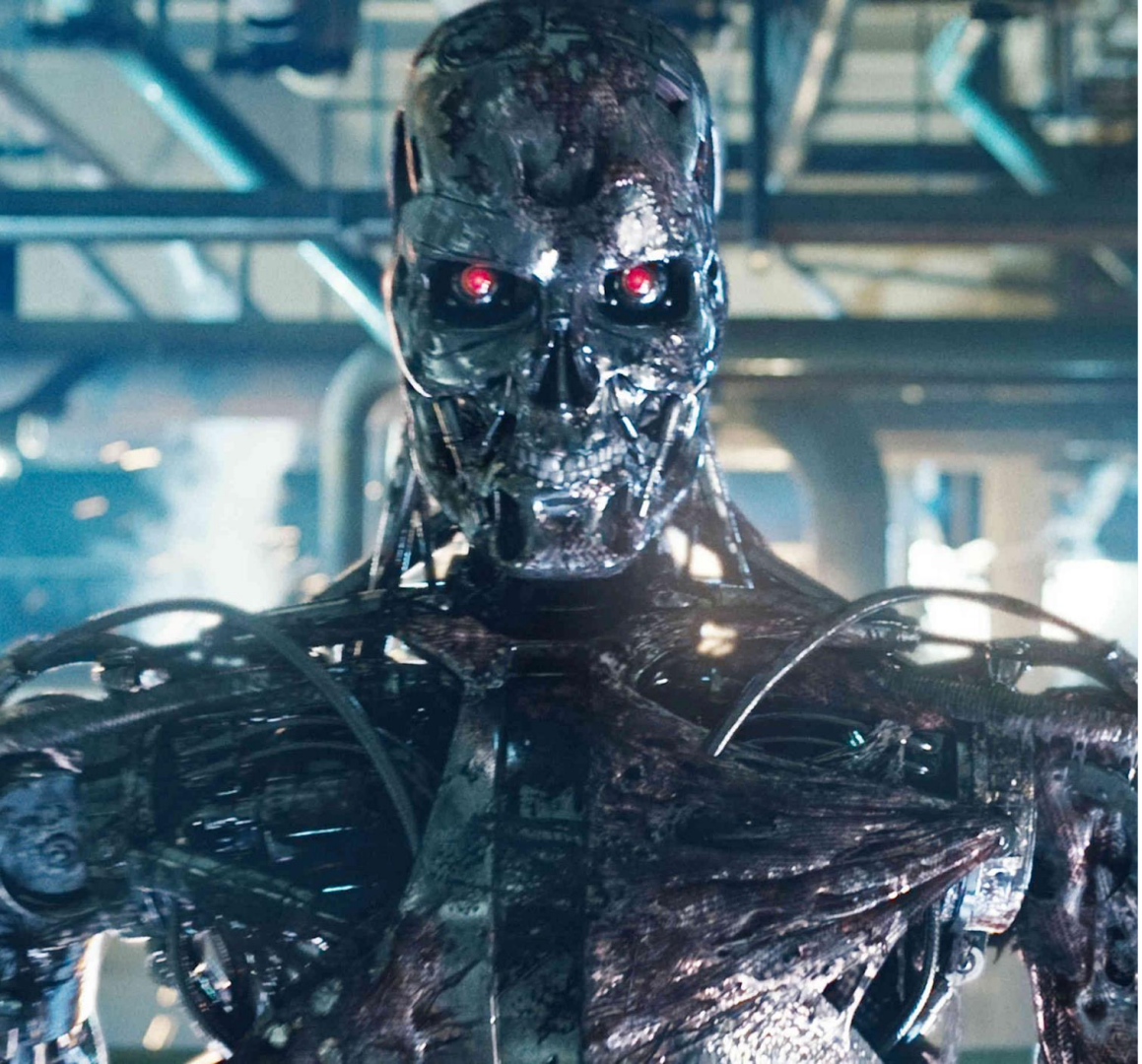
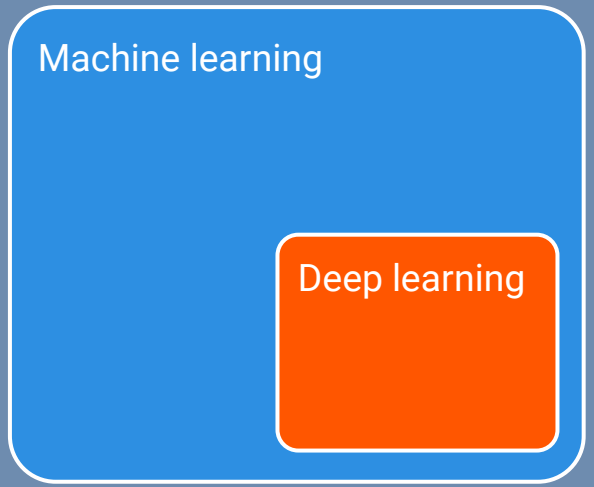


Not AI.

Definitions



AI

Systems able to perform tasks that ordinarily require human intelligence

Machine learning

Learning from the past to predict the future

Deep learning

A specialised kind of machine learning which uses multi-layer neural networks to imitate the workings of the human brain to process data and creating patterns for use in decision making

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Supervised machine learning

Ground truth (outcomes) known

Predict this

from these

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Unsupervised machine learning

No ground truth

what is similar? what is different?

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Machine learning is a two-stage process

1. Training

2. Scoring

addressing challenges in ML adoption

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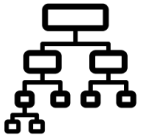
How to address these challenges properly?

Presence of bias in the data



Trade-off between Accuracy & Interpretability

What if the model makes a mistake?

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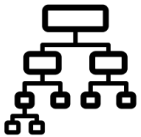

Trade-off between Accuracy & Interpretability

What if the model makes a mistake?

Training the workforce

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Training the workforce

1. Online courses

2. Learning from working on a real use case

3. Learning with a partner

4. Developing your own learning material

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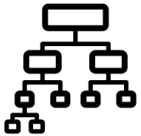

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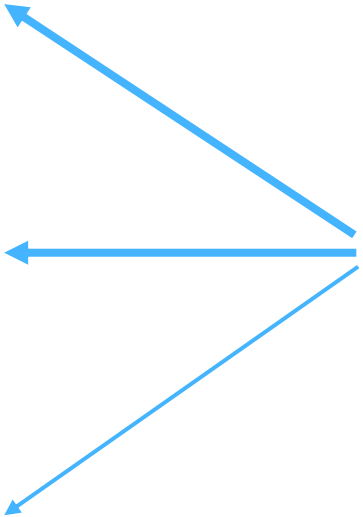

Adopting the best practices

Training the workforce

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Adopting the best practices

Methodology

Data partitioning: *Cross-validation, out-of-time validation, group partitioning*

Evaluation: *measures of accuracy*

Model building

Accuracy vs Interpretability: *you don't have to give up on accuracy to get interpretable models*

- *Regularized Logistic Regression, GA2M, Eureqa…*
- *Favouring small number of attributes*

Bias in data: *monotonicity constraints*

Model consumption

Prediction explanation: *each prediction should be explained in terms of impact of each attribute (sign and intensity)*

What-if scenario builder: *model should be understood for different real-life scenarios*

Presenting the most similar data points: *raw historical data should be shown as explanation when similar new data points are scored*

Data scientist

Expert *(doctor, nurse…)*

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How to address these challenges properly?

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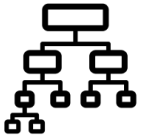

Trade-off between Accuracy & Interpretability

What if the model makes a mistake?

Training the workforce

Adopting the best practices

Identifying early on potential risks

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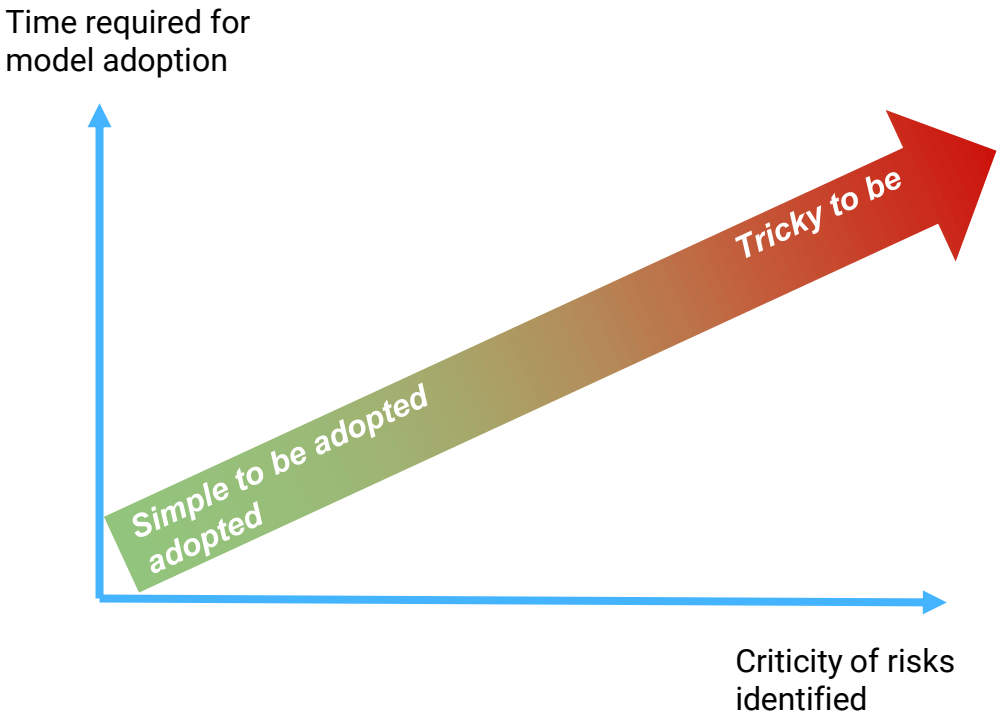
Identifying early on potential risks

Multiple risks for each use case

- Model's performance on new data not as good as on training data
- Model's mistakes can be handled: false negatives, false positives
- Model's prediction explanation doesn't make sense
- Bias from training data
- Data drift
- Model's returning an error
- Fairness
- ...



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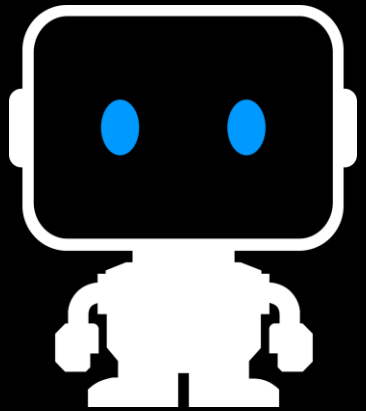
DataRobot

The world's most advanced Enterprise Machine Learning Automation platform

Founded in 2012
HQ in Boston, MA

0 pivots
100% focused on automating machine learning and AI.



$431 million in funding
$100M Series D raised in October 2018.

1000+ employees in 15 countries
Over half are data scientists and engineers.

BANKING FINTECH INSURANCE HEALTHCARE MANY MORE

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