ANALYTICS FRONTIERS CONFERENCE 2018

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AI & ML

Lessons Learnt & real-world challenges

Avishkar Misra PhD
Practice Director – Data Science & Analytics for Americas

Founded in 2010 industry thought leader focused on **Business Results**.

Founded **in Open Source --** Eye towards **analytic outcome.**

We are the **SI business of Teradata.**

Who Is Think Big?

1st Big Data provider 100% focused around open source.

Apache Hadoop and cloud ecosystem integration.

6000+ employees (2018)

Full spectrum consulting, data engineering, data science & BI support.

So far we have delivered **2000+** current projects at any time **$700M + in Revenue**.

Data Science & Analytics

Analytic tools

Languages

Data sources

Analytic engines

Teradata Aster


Five  lessons

Amazon Go: No Checkout. Pick up and walk out.

source: amazon.com/go

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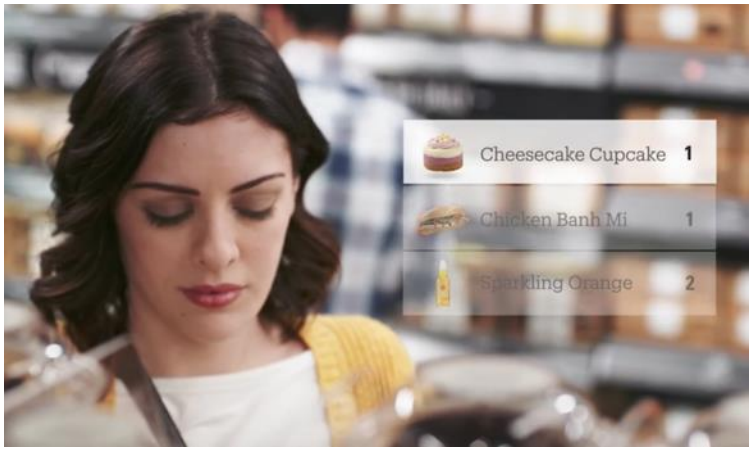
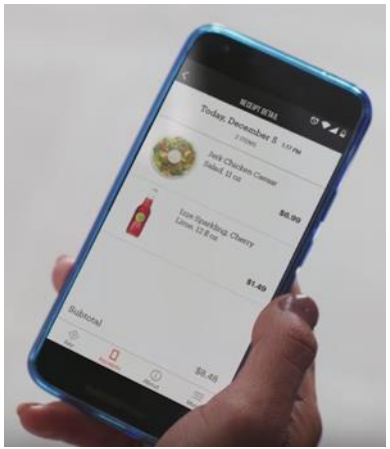
Amazon Go: No Checkout. Pick up and walk out.





source: amazon.com/go

Save time for customers

Improve customer service

Prevent empty shelf events

Coupons 2.0

#1 – Flow-on benefits (& consequences) extend beyond the obvious.

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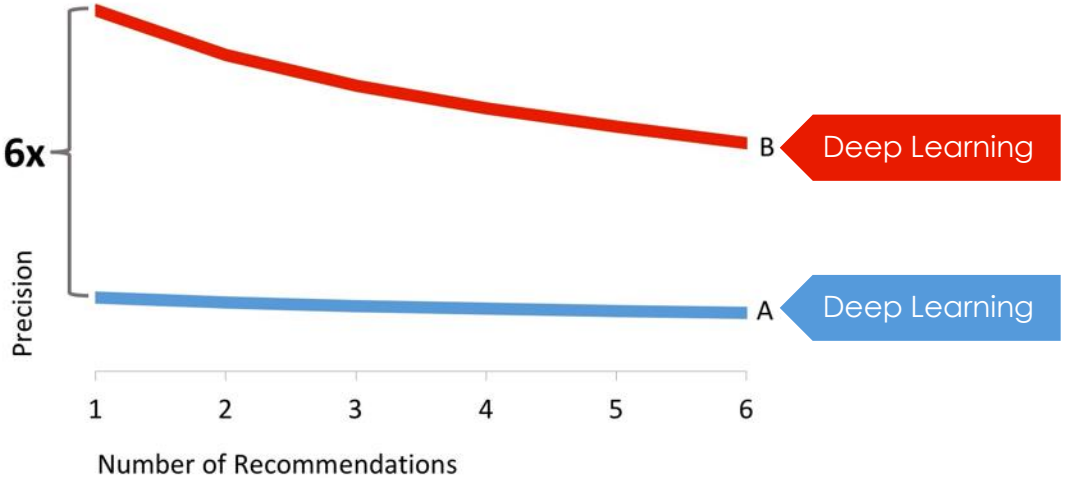
Deep Learning for Recommendations



A & B had identical neural network structure, size and training parameters.

The difference is how the problem was formulated.

Details: Rybakov et al., *The Effectiveness of a Two-Layer Neural Network for Recommendations*, ICLR 2018
→ https://openreview.net/forum?id=B1lMMx1CW

#2 – Formulate and solve the right problem, even if it is not how its done now.

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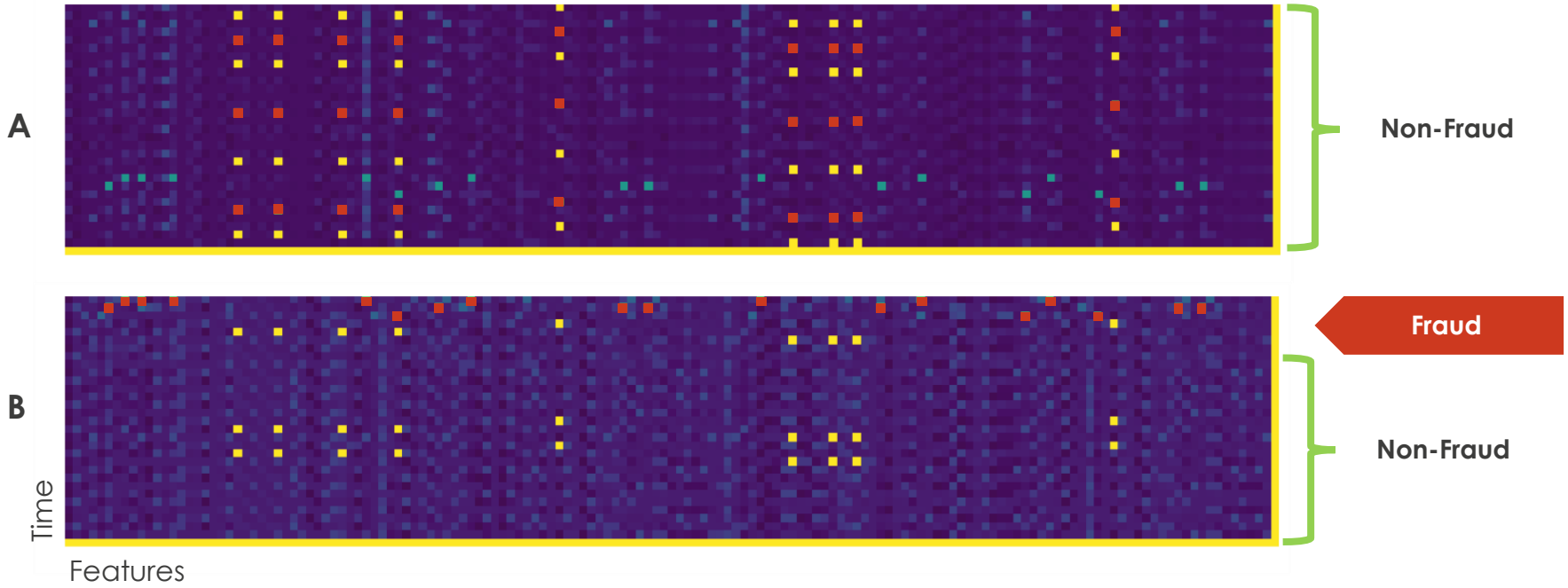
Deep Learning for Fraud Detection



Neural Networks (CovNets, LSTM, Autoencoders) to transaction images

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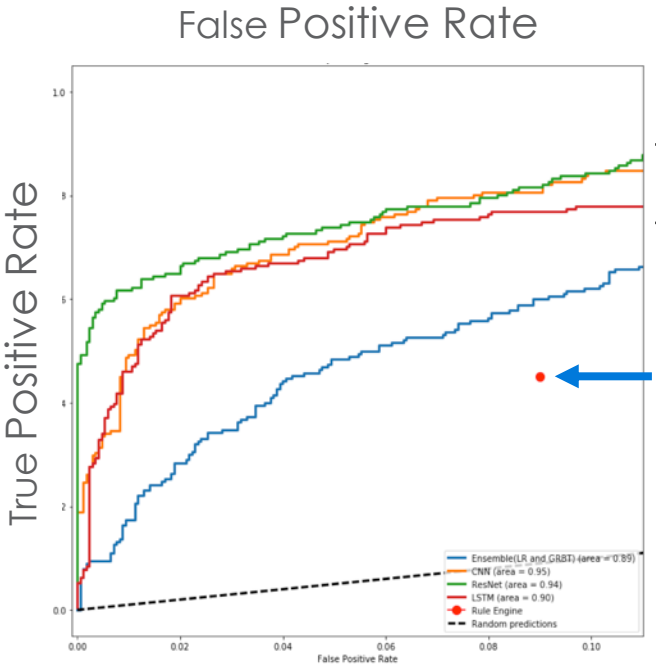
Deep Learning for Fraud Detection



Deep Learning

Machine Learning

Legacy Rule System

50% ↑ Fraud Detection Rate

60% ↓ False Positive Rates

#3 – Avoid domain myopia and look for inspiration across domains.

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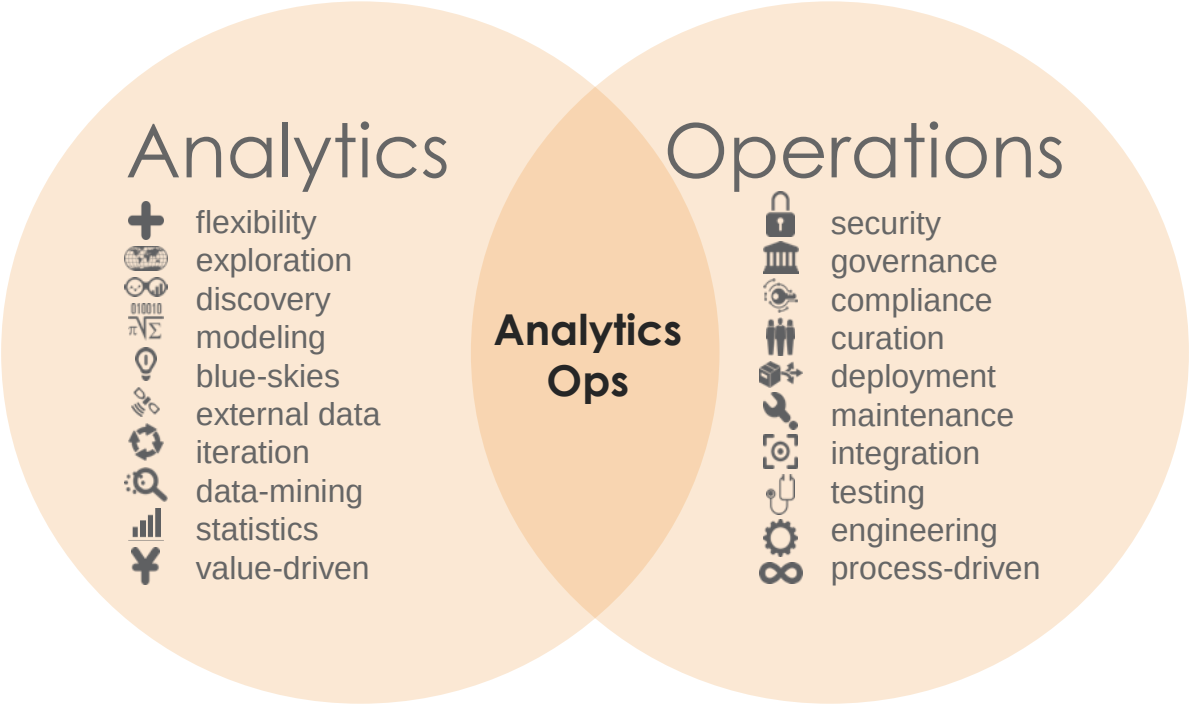
Across the board – Getting to Production

5 months
Average to develop, test, validate, deploy and scale new analytical models

2 weeks



#4 – Work backwards. Think production first. The lab is not enough.

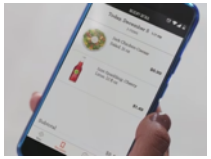
Across the board – Failure is inevitable

It ~~may~~ will **NOT** work the first time…

... or even the 4th time.

Mitigate the cost of failure.

#5 – De-risk failure by speeding and scaling up experimentation



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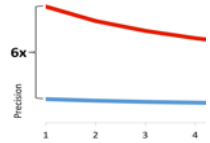

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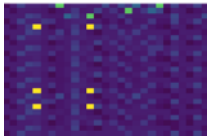

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#4 – Work backwards. Think production first. The lab is not enough.

#5 – De-risk failure by speeding and scaling up experimentation

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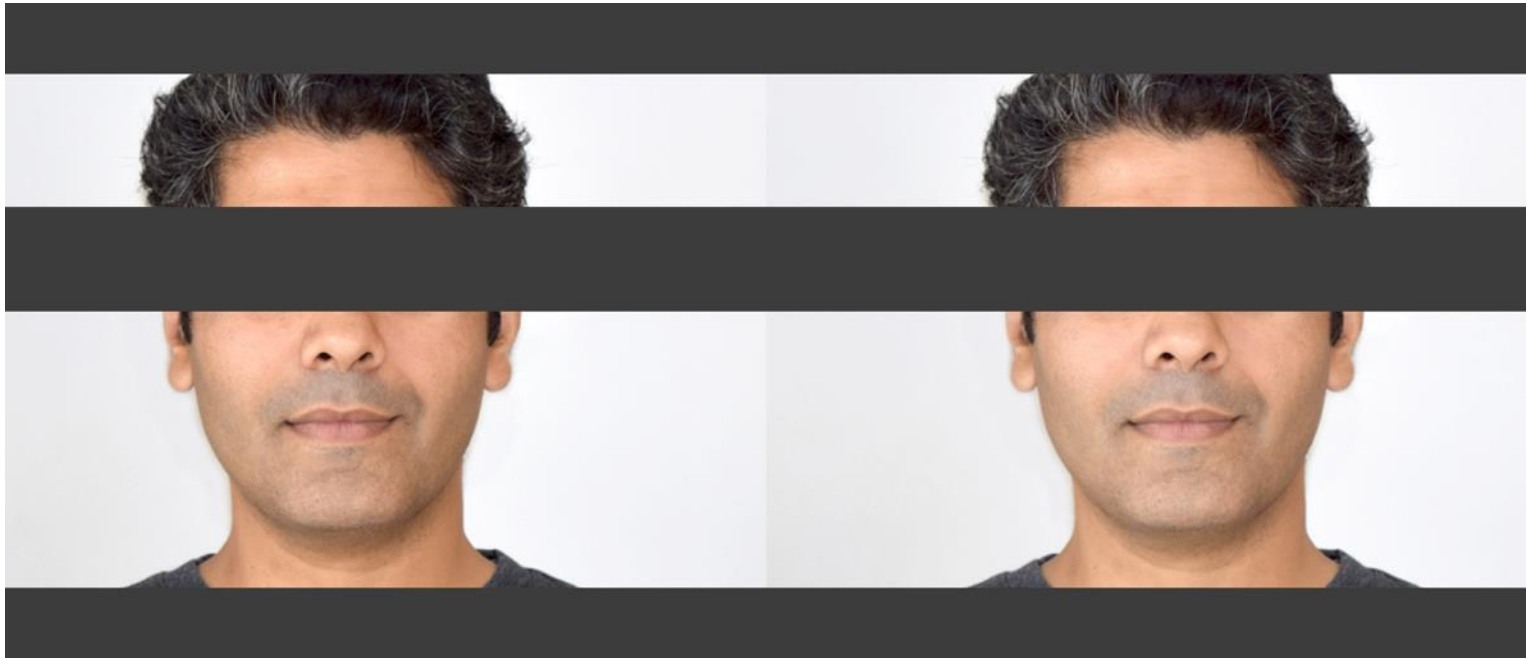
Risks in adopting AI & ML

Biased Data and Poor Quality Control



One of these photos failed automatic quality checks

What can we do…?

#1 – Train Humans

More CS grads AND key decision makers in organizations.

#2 – Establish Standards

Processes and methods to verify and validate data & models holistically.

#3 – Automated Tools

Automated tools, verification and validation to surface potential data & model biases.

Lets talk…

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References:

Rybakov et al., *The Effectiveness of a Two-Layer Neural Network for Recommendations*, ICLR 2018, https://openreview.net/forum?id=B1lMMx1CW

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