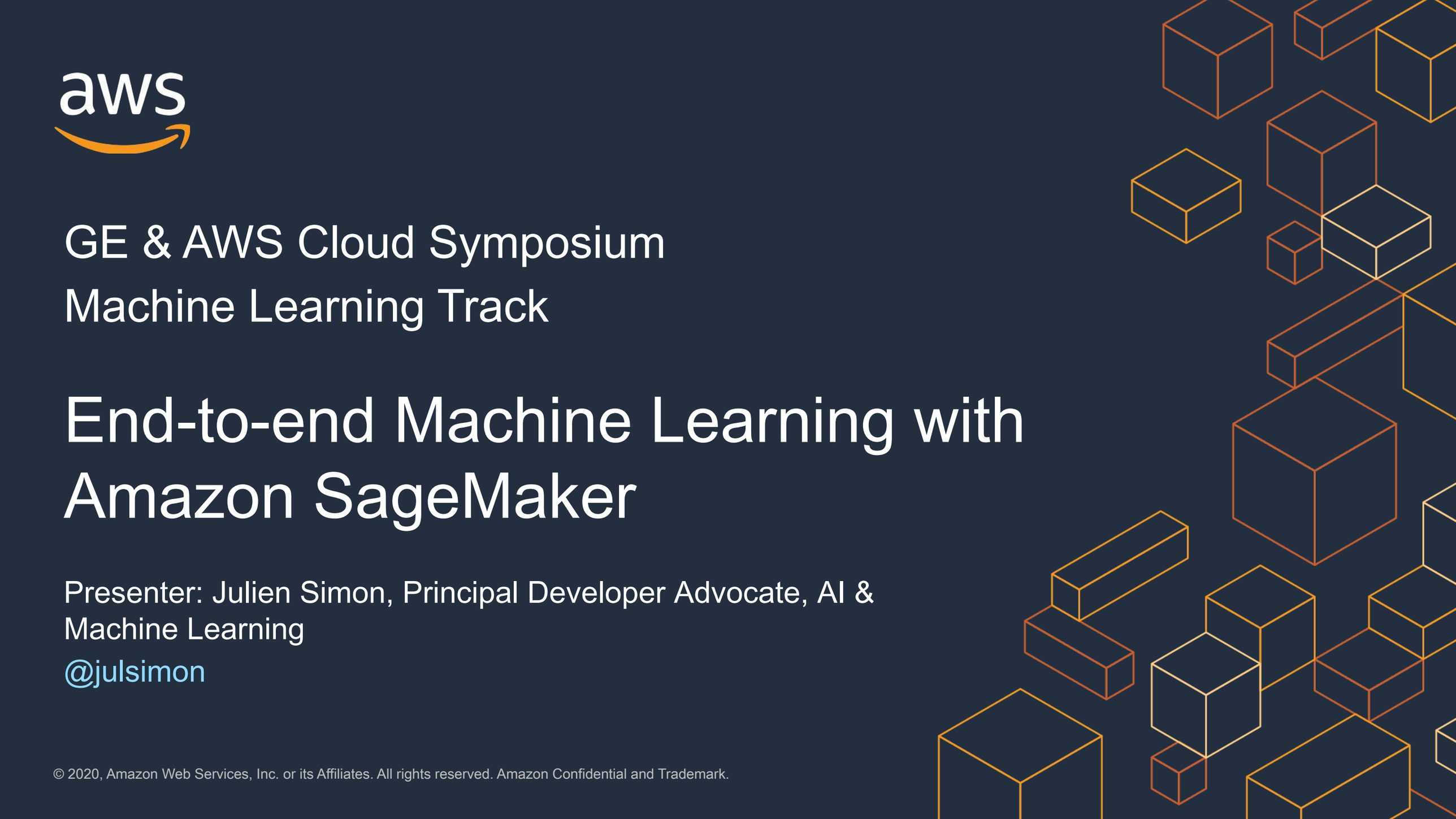


GE & AWS Cloud Symposium

Machine Learning Track

End-to-end Machine Learning with Amazon SageMaker

Presenter: Julien Simon, Principal Developer Advocate, AI & Machine Learning

@julsimon

The machine learning workflow is iterative and complex

Prepare

Collect and prepare training data

Build

Choose or build an ML algorithm

Train & Tune

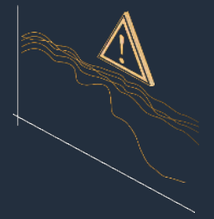
Set up and manage environments for training

Train, debug, and tune models

Manage training runs

Deploy & Manage

Deploy model in production



Monitor models

Validate predictions

Scale and manage the production environment

Amazon SageMaker helps you build, train, and deploy models

Prepare | **Build** | **Train & Tune** | **Deploy & Manage**

Web-based IDE for machine learning

Automatically build and train m

Fully managed data processing jobs and data labeling workflows

Collect and prepare training data

One-click collaborative notebooks and built-in, high performance algorithms and models

Choose or build an ML algorithm

One-click training

Set up and manage environments for training

Debugging and optimization

Train, debug, and tune models

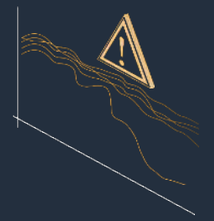
Visually track and compare experiments

Manage training runs

One-click deployment and autoscaling

Deploy model in production

Automatically spot concept drift



Monitor models

Add human review of predictions

Validate predictions

Fully managed with auto-scaling for 75% less

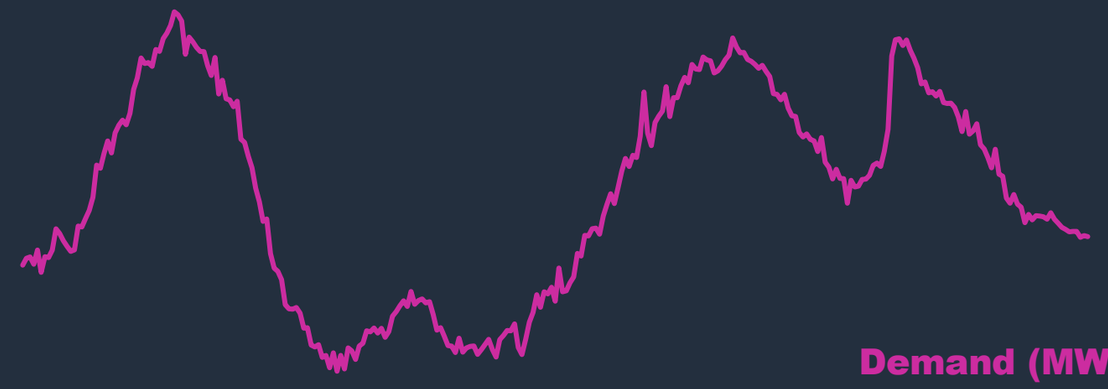
Scale and manage the production environment

Modular service and APIs, from experimentation to production

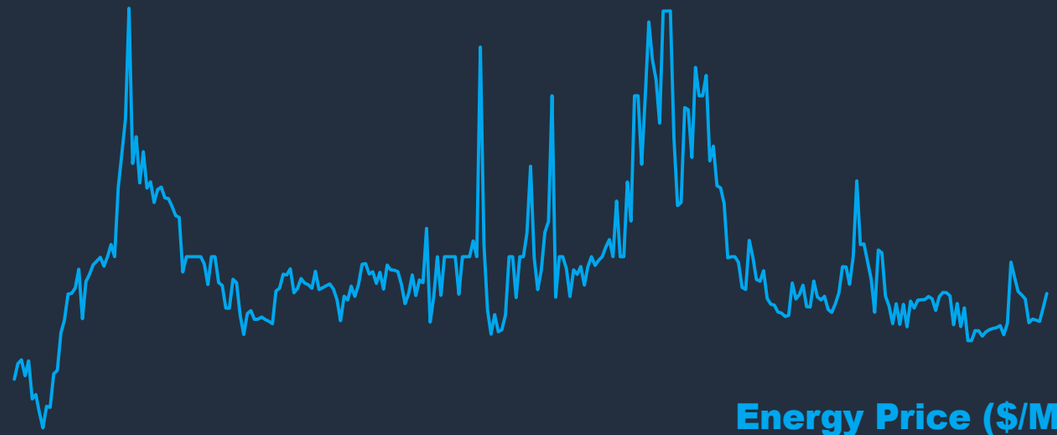
Advanced Microgrid Solution: Predicting Electricity Markets

AWS re:Invent 2018 session (AIM410R2) – https://www.youtube.com/watch?v=VIEp4GR9BRc

- Electricity is traded in regional "wholesale energy markets"
- Supply = Demand at all times... or grid will fail
- Demand varies due to weather and behavioral factors
- Market operator must procure correct amount of supply to meet demand
- Suppliers must decide price and quantity to bid every 5 minutes
- Market Price is set at the most expensive supplier needed to meet demand



Demand (MW)



Energy Price ($/MWh)

British Airways: Predictive Maintenance for Aircrafts

AWS re:Invent 2019 session (AIM307) – https://www.youtube.com/watch?v=Ac5m4-xWtCU

S3 Storage

Data optimization and Metadata generation

Condition monitoring

Amazon SageMaker

Aeroplane	Date	Flight No	Route	Condition a	Condition b	Condition c
G-ZBWW	12th Nov	BA 012	LHR → LAS	🟢	🟢	🟢
G-ZBWW	13th Nov	BA 013	LAS → LHR	🟢	🟡	🟢
G-ZBWW	13th Nov	BA 132	LHR → JFK	🟢	🟡	🟢
G-ZBWW	14th Nov	BA 133	JFK → LHR	🟢	🟠	🟢

Demo

https://gitlab.com/juliensimon/awsdevdays2020

The AWS AI & Machine Learning Stack

AI SERVICES

VISION	SPEECH		TEXT			SEARCH	CHATBOTS	PERSONALIZATION	FORECASTING	FRAUD	DEVELOPMENT	CONTACT CENTERS
Amazon Rekognition	Amazon Polly	Amazon Transcribe *+Medical*	Amazon Comprehend *+Medical*	Amazon Translate	Amazon Textract	Amazon Kendra	Amazon Lex	Amazon Personalize	Amazon Forecast	Amazon Fraud Detector	Amazon CodeGuru	Contact Lens *For Amazon Connect*

ML SERVICES

Amazon SageMaker

Ground Truth	ML Marketplace	SageMaker Studio IDE								Neo	Augmented AI
		Built-in algorithms	Notebooks	Experiments	Processing & Model Evaluation	Model training & tuning	Debugger	Autopilot	Model hosting	Model Monitor	

ML FRAMEWORKS & INFRASTRUCTURE

TensorFlow · mxnet · PYTORCH · GLUON · Keras · Deep Graph Library

Deep Learning AMIs & Containers	GPUs & CPUs	Elastic Inference	Inferentia	FPGA

aws

Getting started

http://aws.amazon.com/free

https://ml.aws

https://aws.amazon.com/sagemaker

https://github.com/aws/sagemaker-python-sdk

https://github.com/awslabs/amazon-sagemaker-examples

https://youtube.com/juliensimonfr

https://medium.com/@julsimon

Thank you

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