

Starting your AI/ML project right

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Does AI have a massive future? Sure! Please insert another coin.

Do we (the builders) have a **clear** idea how to get there? Hmmmm.

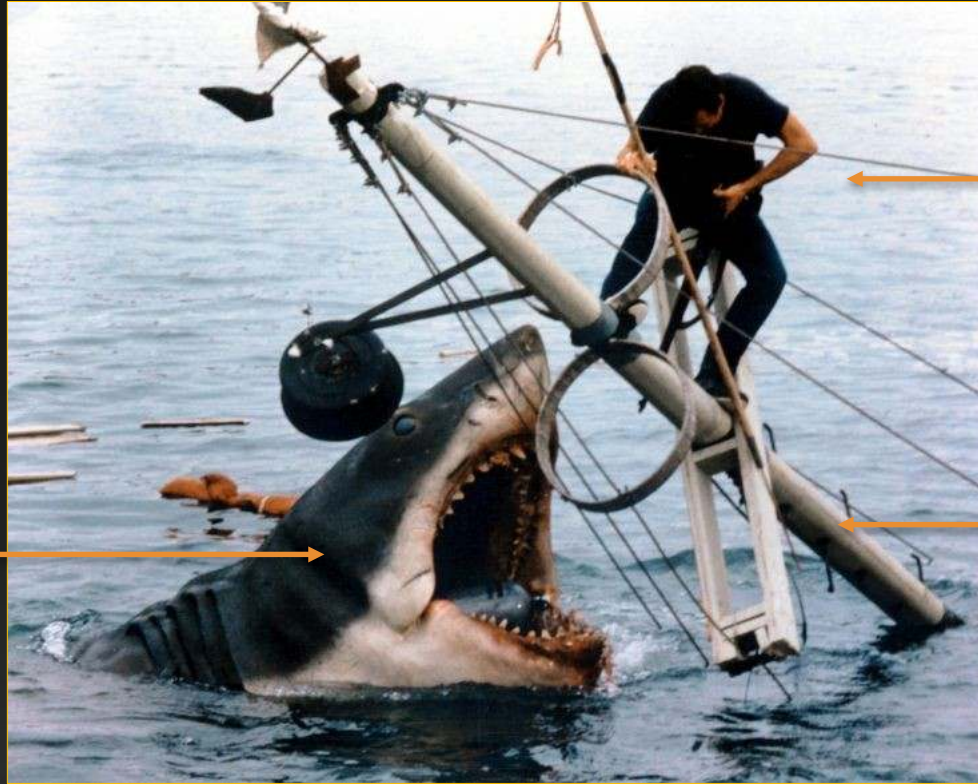
***« If you want to know the future,
look at the past »***

Albert Einstein

What's our collective track record on understanding
and implementing disruptive technologies?

2000

Your
competitor



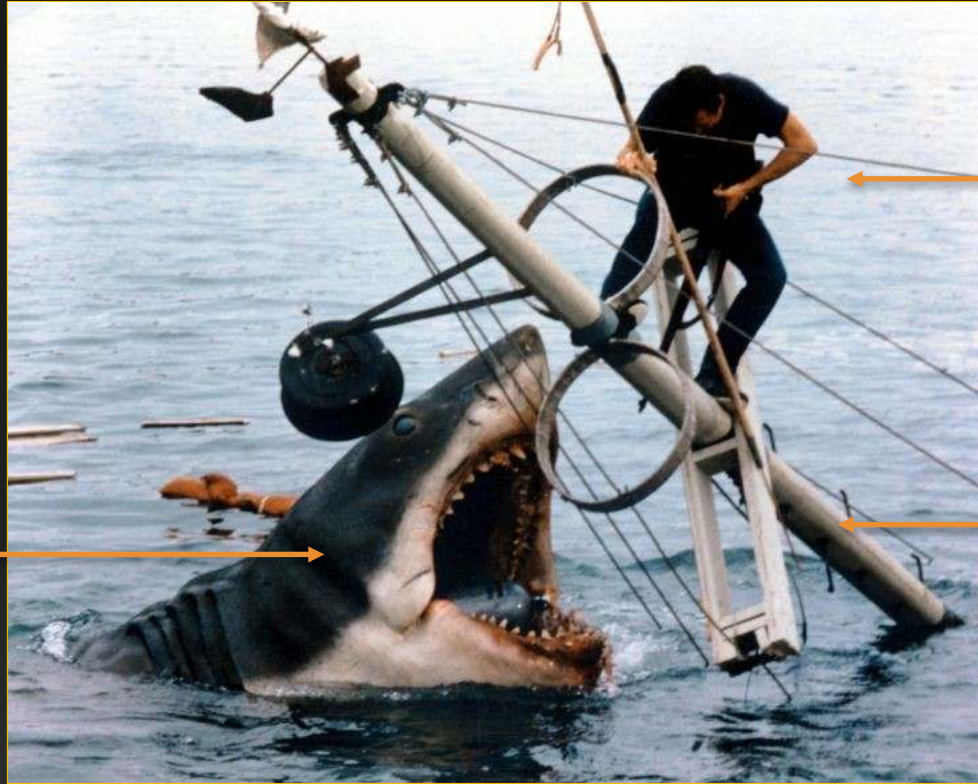
You

Your
Web
project

Universal
Pictures

2005

Your
competitor



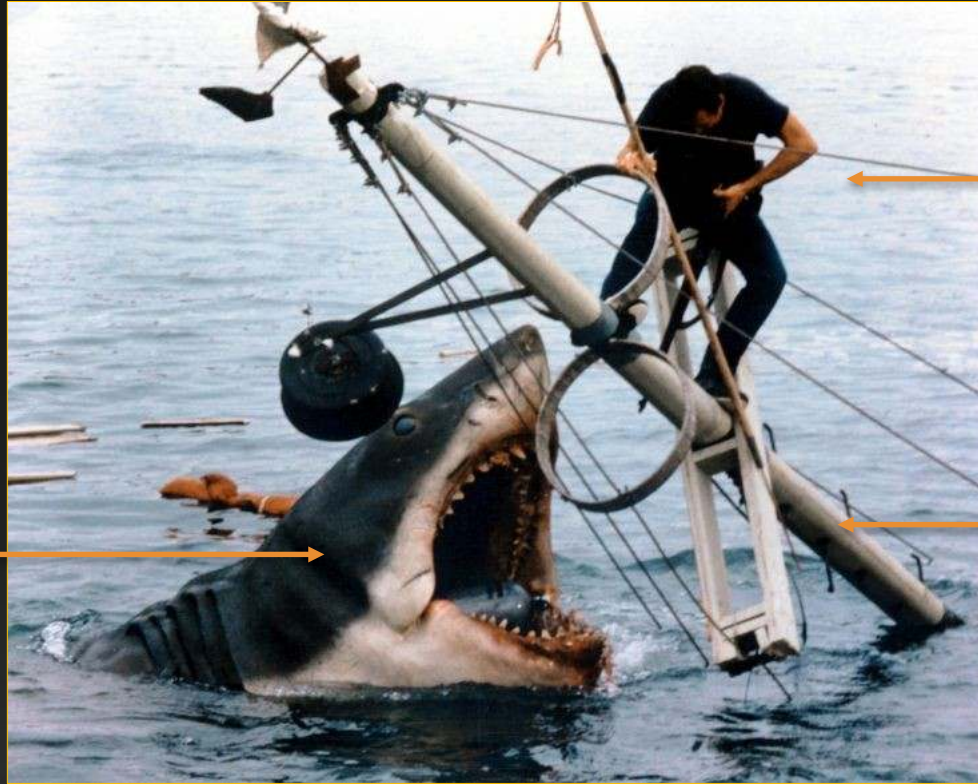
You

Your
E-commerce
project

Universal
Pictures

2010

Your
competitor



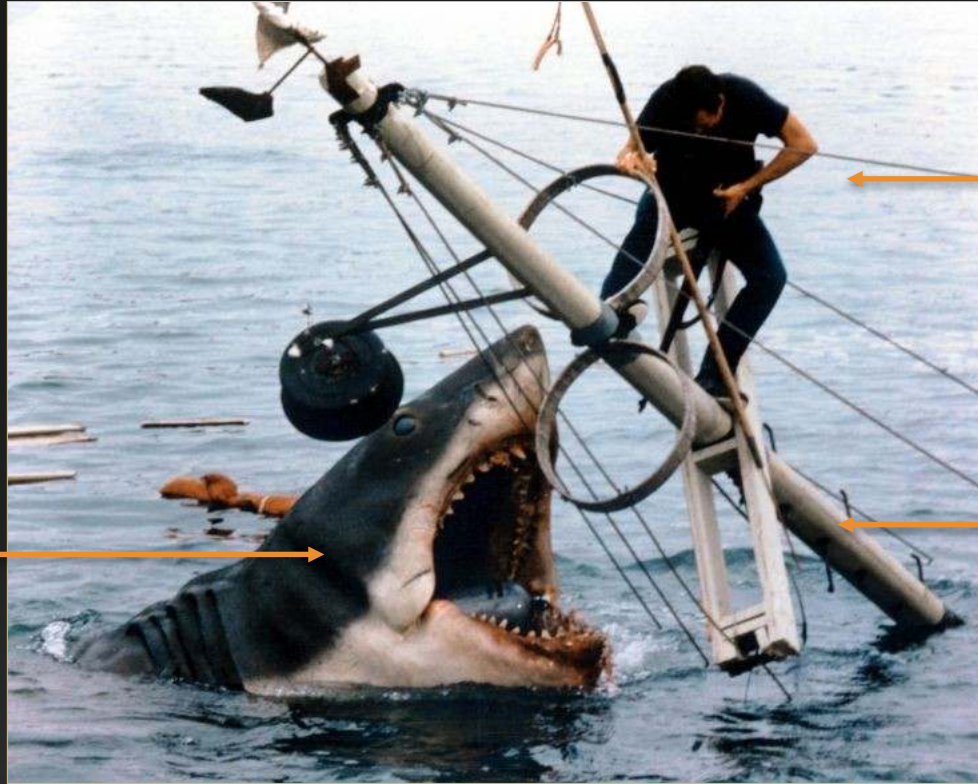
You

Your
M-
commerce
project

Universal
Pictures

2015

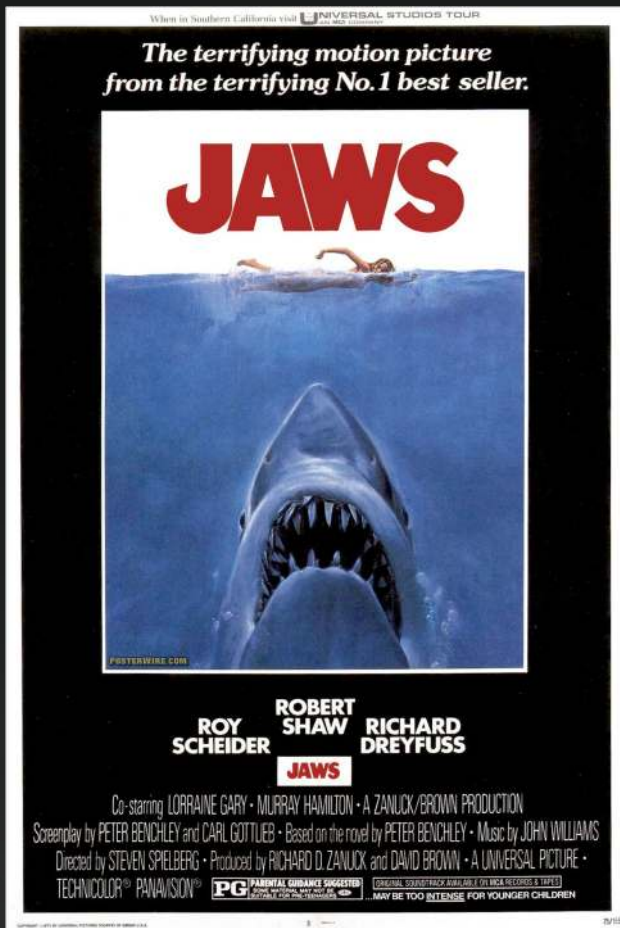
Your
competitor



You

Your
Big
Data
project

Universal
Pictures



The terrifying truth about tech projects

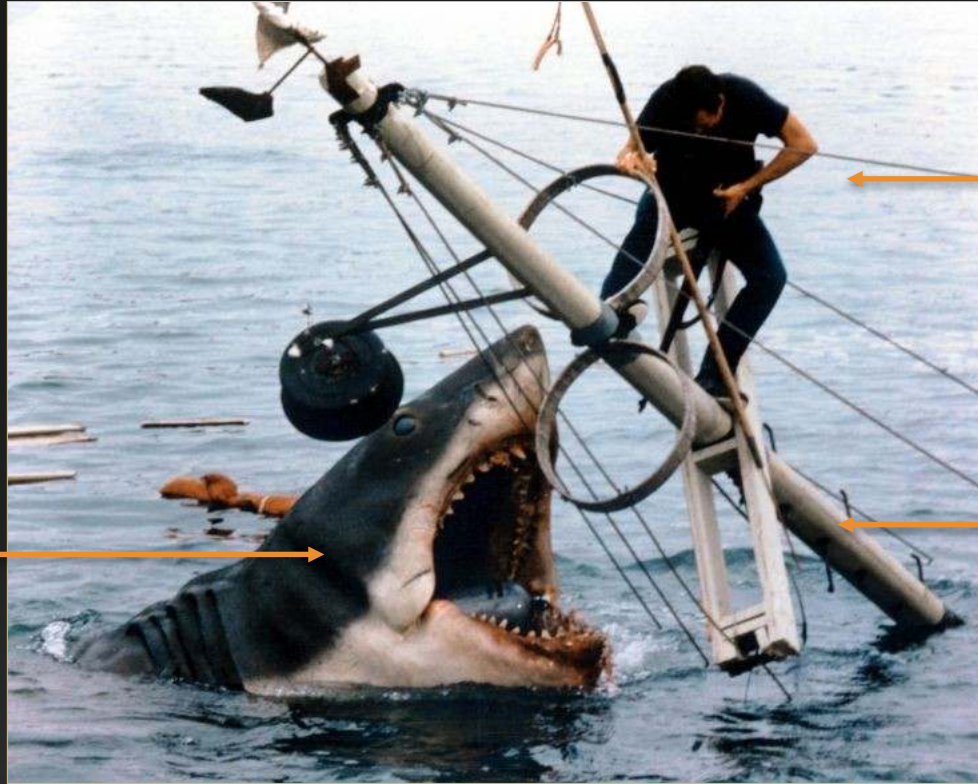
Delusional stakeholders
Business pressure
Unprepared team
Inadequate tools
Improvised tactics
Random acts of bravery

***« It's different this time!
The AI revolution is here!
Blah blah blah »***

You know who

2020

Your
competitor



You

Your
AI / ML
project

Universal
Pictures

« Insanity is doing the same thing over and over again and expecting different results »

Whoever said it first

Tired of being shark food?

Delusional stakeholders
Business pressure
Unprepared team
Inadequate tools
Improvised tactics
Random acts of bravery



Set expectations
Define clear metrics
Assess your skills
Pick the best tool for the job
Use best practices
Iterate, iterate , iterate

1 - Set expectations

- What is the **business** question you're trying to answer?
 - One sentence on the whiteboard
 - Must be **quantifiable**
- Do you have (enough) **data** that could help?
- Involve everyone and come to a **common** understanding
 - Business, IT, Data Engineering, Data Science, Ops, etc.

« We want to see what this technology can do for us »

« We have tons of relational data, surely we can do something with it »

« I read this cool article about FooBar ML, we ought to try it »



2 - Define clear metrics

- What is the **business metric** showing success?
- What's the **baseline** (human and IT)?
- What would be a **significant** and **reasonable** improvement?
- What would be **reasonable** further improvements?

« The confusion matrix for our support ticket classifier has significantly improved ». **Huh?**

« P90 time-to-resolution is now under 24 hours ». **Err....**

« Misclassified emails have gone down 5.3% using the latest model ». **So?**

« The latest survey shows that 'very happy' **customers** are up 9.2% ». **Woohoo!**

3 - Assess needs (not wants) and skills

- Building a data set describing the problem?
- Cleaning and curating it?
- Writing and tweaking ML algorithms?
- Managing ML infrastructure?

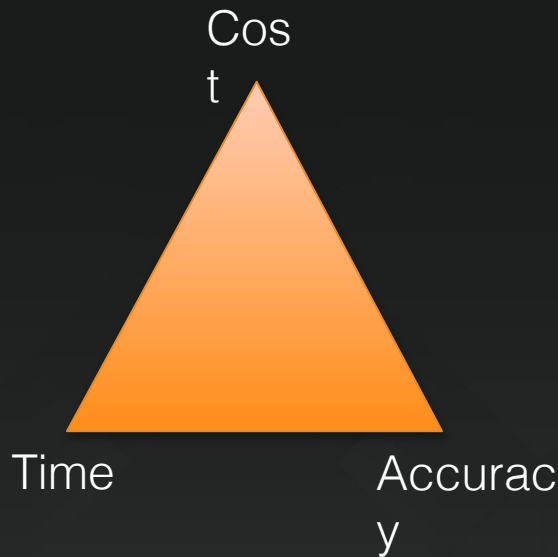
Fully
manage
d



100%
DIY

4 - Pick the best tool for the job

- Cost, time to market, accuracy: **pick two**
- The least expensive and fastest option won't probably be the most accurate.
 - Maybe enough to **get started**, and **learn** more about the problem.
- Improving accuracy will take **increasingly** more time and money.
 - Diminishing returns! Know when to stop.
- Keep an eye on **actionable** state of the art advances, ignore the rest
 - Transfer learning
 - AutoML



5 - Use best practices

- No, things are **not** different this time.
- AI / ML is **software engineering**
 - Dev, test, QA, documentation, Agile, versioning, etc.
 - Involve all teams
- Sandbox tests are nice, but truth is in **production**
 - Get there fast, as often as needed
 - CI / CD and automation are required
 - Devops for ML



Universal
Pictures

6 - Iterate, iterate, iterate

aka Boyd's Law (1960)

- Start **small**
- Try the **simple** things first
- Go to production **quickly**
- Observe prediction **errors**
- Act: fix data set? Add more data? Tweak the algo? Try another algo?
- Repeat until accuracy gains become **irrelevant**
- Move to the **next** project

6 – Machine Learning *is* an iterative process

« *Does this work?* »

Everyone in this room

AI and Machine Learning on AWS

Tens of thousand of active customers – all sizes, all verticals




The AWS ML Stack

AI SERVICES

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

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  fastai  Keras  Deep Graph Library	Deep Learning AMLs & Containers	GPUs & CPUs	Elastic Inference	Inferentia	FPGA
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MODERNIZE YOUR CONTACT CENTER TO IMPROVE CUSTOMER SERVICE

Voice of the customer analytics | Automated service agents | Multi-lingual text support
Workforce forecasting and agent analysis | Next best action recommendation

Vonage®



POLLY



TRANSCRIBE



TRANSLATE



COMPREHEND



LEX



PERSONALIZE

USE AI SERVICES TO STRENGTHEN SAFETY AND SECURITY

Risk assessment | Threat detection | Identity verification | Alarm prioritization

THORN¹

 **MARINUS**
ANALYTICS


AELLA CREDIT

paylater



REKOGNITION
IMAGE



REKOGNITION
VIDEO



COMPREHEND

AUTOMATE MEDIA WORKFLOWS TO REDUCE COSTS AND MONETIZE CONTENT

Media metadata tagging | Highlight clipping | Subtitling and localization | Content moderation |
Compliance | Contextual ad insertion



SAGEMAKER



REKOGNITION
IMAGE



REKOGNITION
VIDEO



COMPREHEND



TRANSCRIBE



TRANSLATE



TEXTRACT

REDUCE LOCALIZATION COSTS AND IMPROVE ACCURACY

Website & document translation | Recorded call analysis | Video subtitling | Accessibility



Hotels.com



Lionbridge



POLLY



TRANSCRIBE



TRANSLATE



COMPREHEND

UNDERSTAND THE VOICE OF YOUR CUSTOMER

Problem detection | Sentiment analysis | Campaign targeting | Personalized service



REKOGNITION
IMAGE



REKOGNITION
VIDEO



TRANSCRIBE



TRANSLATE



COMPREHEND

PERSONALIZE CUSTOMER EXPERIENCES WITH TARGETED RECOMMENDATIONS

Personalized recommendations | Personalized search | Personalized notifications

Voodoo



SUBWAY



ZOLA



ABLY

NAVITIME

Pomelo.



PERSONALIZE

ACCURATELY FORECAST FUTURE BUSINESS OUTCOMES

Workforce planning | Product and advertising demand | Sales by store |
Web traffic projection | Inventory optimization | AWS usage



FORECAST

INCREASE EFFICIENCY WITH AUTOMATED DOCUMENT ANALYSIS

Fast archive search | Automated form processing | Systematic redaction



TEXTTRACT



COMPREHEND &
COMPREHEND
MEDICAL

PROTECT USERS FROM UNSAFE CONTENT

UGC curation | Media compliance marking | Ad adjacency assurance



RECOGNITION
IMAGE



RECOGNITION
VIDEO



TRANSCRIBE



COMPREHEND

AWS Marketplace for Machine Learning

DIMENSIONALMECHANICS™



H₂O.ai



figure eight



TIBCO™

SELLERS

Automatic labeling via machine learning

IP protection

Automated billing and metering

BUYERS

Broad selection of paid, free, and open-source algorithms and models

Data protection

Discoverable on your AWS bill

Natural language processing

Ranking

Text OCR

Computer vision

Named entity recognition

Video classification

Speech recognition

Text-to-speech

3D images

Text classification

Speaker identification

Anomaly detection

Text generation

Object detection

Regression

Text clustering

Handwriting recognition

Grammar and parsing

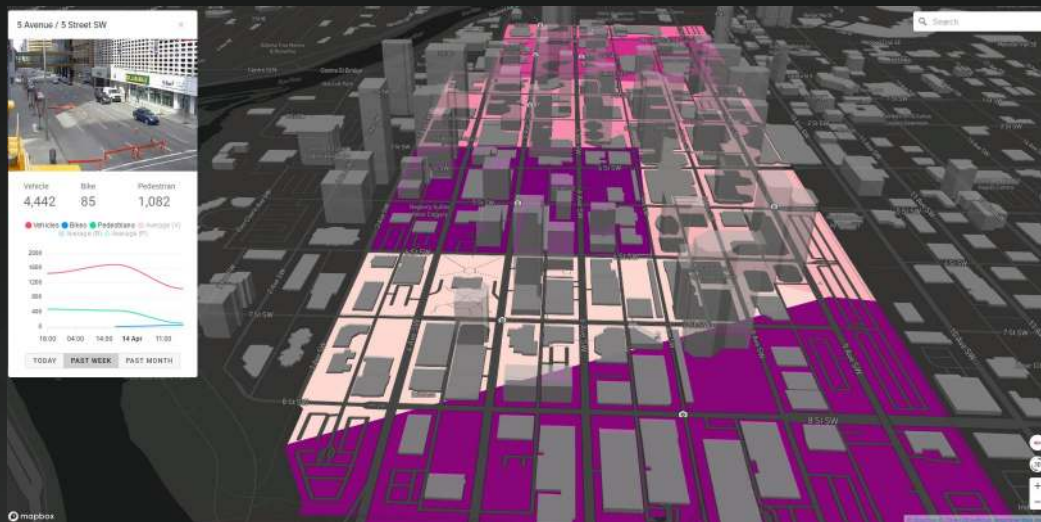
AWS Marketplace Developer Challenge

<https://awsmarketplaceml.devpost.com/>

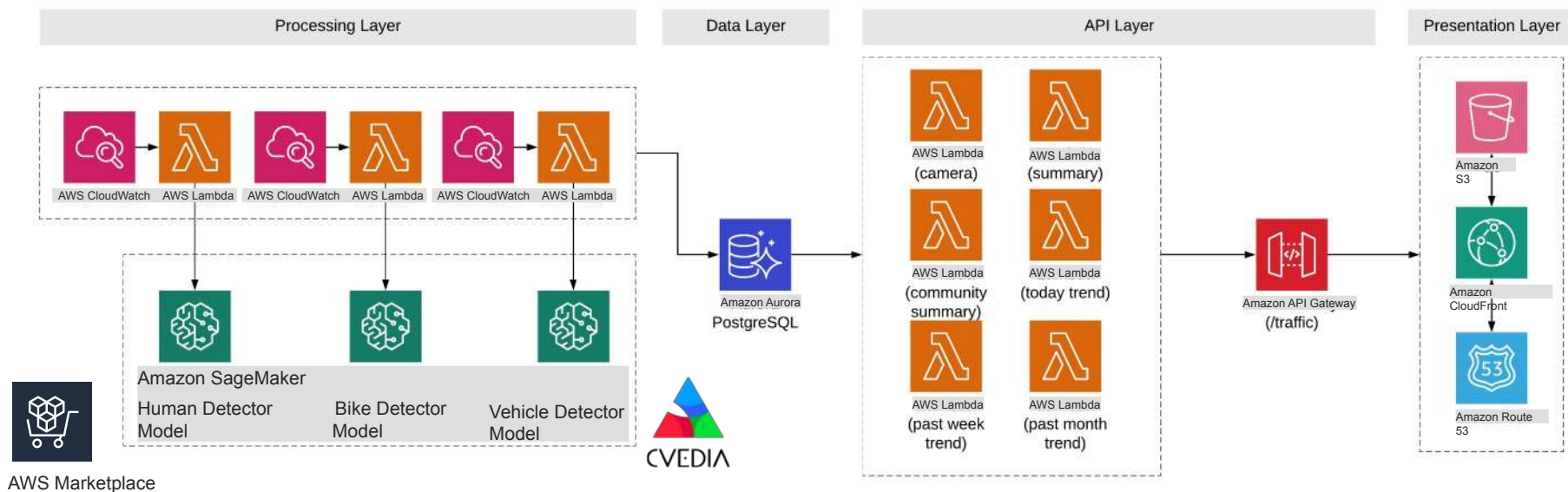
<https://www.youtube.com/watch?v=BRCS7Q3u-ck>

1st place: Mobility Explorer

<https://devpost.com/software/mobility-explorer>



Mobility Explorer - Architecture



https://ml.aws

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<https://medium.com/@julsimon>

<https://youtube.com/juliensimonfr>