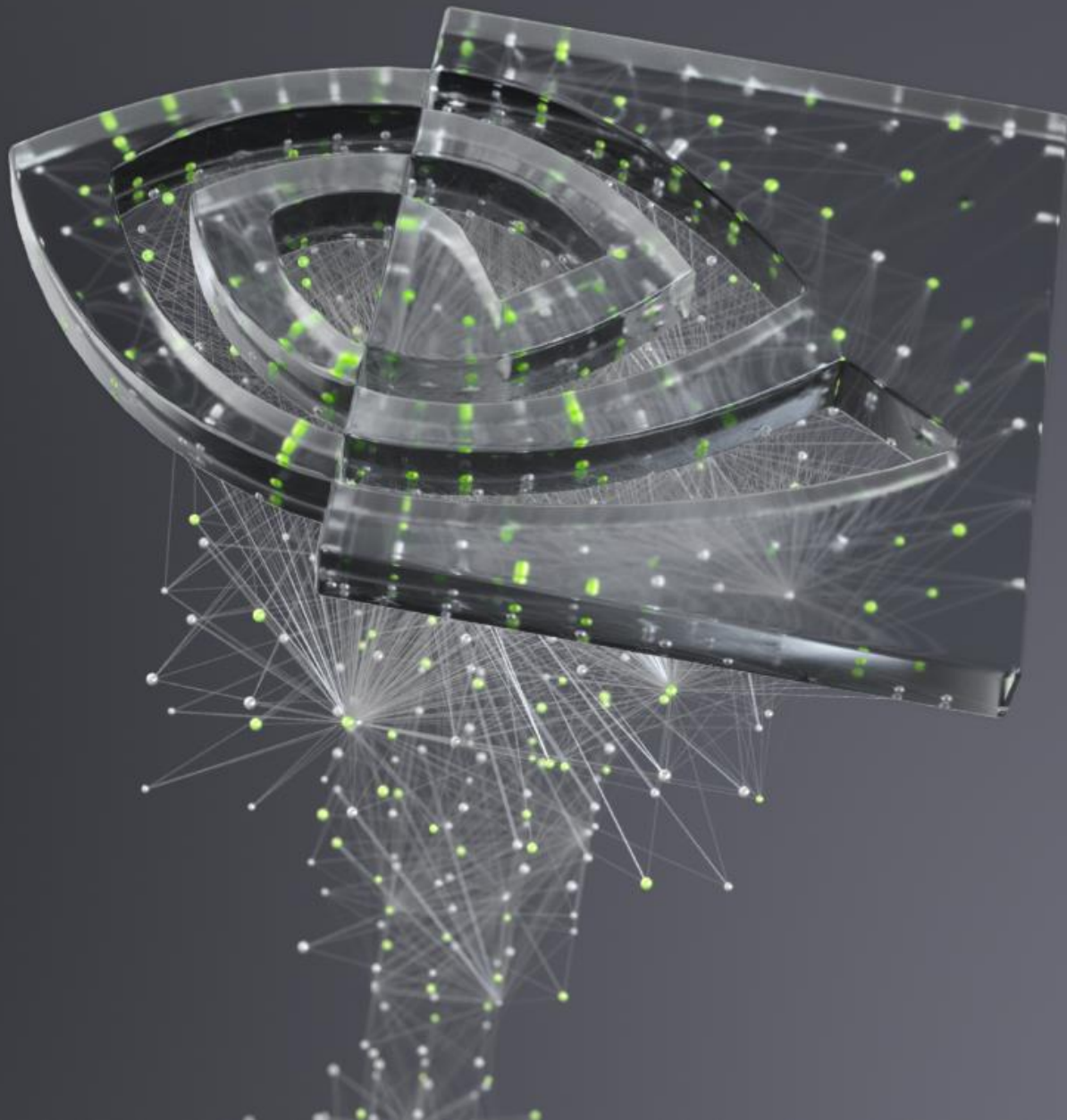




APLICAÇÕES DA IA, DA PIZZA À SAÚDE

Marcel Saraiva

msaraiva@nvidia.com



The background image shows an offshore oil and gas platform. Overlaid on the image are various colored regions (red, yellow, cyan) representing detected corrosion. These regions are scattered across the platform's structure, including pipes, walkways, and equipment. The text is overlaid on a dark, semi-transparent rectangular area in the upper right portion of the image.

TRANSFORMING FABRIC MAINTENANCE FOR THE OIL AND GAS INDUSTRY

Fabric maintenance involves finding corrosion on offshore oil and gas platforms and is crucial for ensuring uninterrupted operations.

Manual physical field inspections are costly, time-consuming, labor-intensive, and have subjective findings that can lead to missed repairs and unplanned shutdowns.

Abyss Solutions' semantic segmentation models use NVIDIA GPU-powered machine learning algorithms to automatically process image surveys and map corrosion across entire platforms.

An independent audit found that Abyss Fabric software delivers better-than-human level corrosion detection for general corrosion at >90% accuracy and >97% accuracy for severe corrosion.

Abyss Fabric users attain up to 25% OPEX cost savings by achieving more efficient fabric maintenance.



The background is a dark blue infographic with various icons and lines. On the left, there's a large rounded square containing a network of people icons and a green checkmark. Below it is a stack of US dollar bills. On the right, there's a pie chart and a bar chart. In the center, a large green circle with a white checkmark is connected to the other elements by blue lines.

IMPROVING FRAUD AND CREDIT CARD LOSS RATES

Credit card fraud is one of the most prevalent – and preventable – types of cybercrime.

American Express selected NVIDIA DGX-1 systems, NVIDIA V100 Tensor Core GPUs and NVIDIA TensorRT to build AI models to prevent fraudulent transactions.

AI systems scan incoming payments in real-time, identify fraudulent transaction patterns and then flag anomalies in milliseconds.





AI-POWERED DESTINATION PREDICTION AND ROUTE PLANNING

Even more than its meticulous engineering, Mercedes-Benz is defined by its continuous innovation. Since inventing the car in 1886, the company has never stopped reinventing it. And now Mercedes-Benz is using AI to enhance the user experience behind the wheel by having its cars predict where drivers want to go.

Trained on driver behavior data from 24,000 road trips, the NVIDIA GPU-accelerated destination prediction AI learns the driver's habits over time in order to make better suggestions.





PLANT DISEASE DETECTION

Adroit LeafSense inspects fruit orchards and discovers diseases and nutritional deficiencies at their onset. Powered by NVIDIA V100 GPUs and NVIDIA JETSON AGX, Adroit LeafSense can detect sick fruits and leaves with 93% accuracy within 300ms.



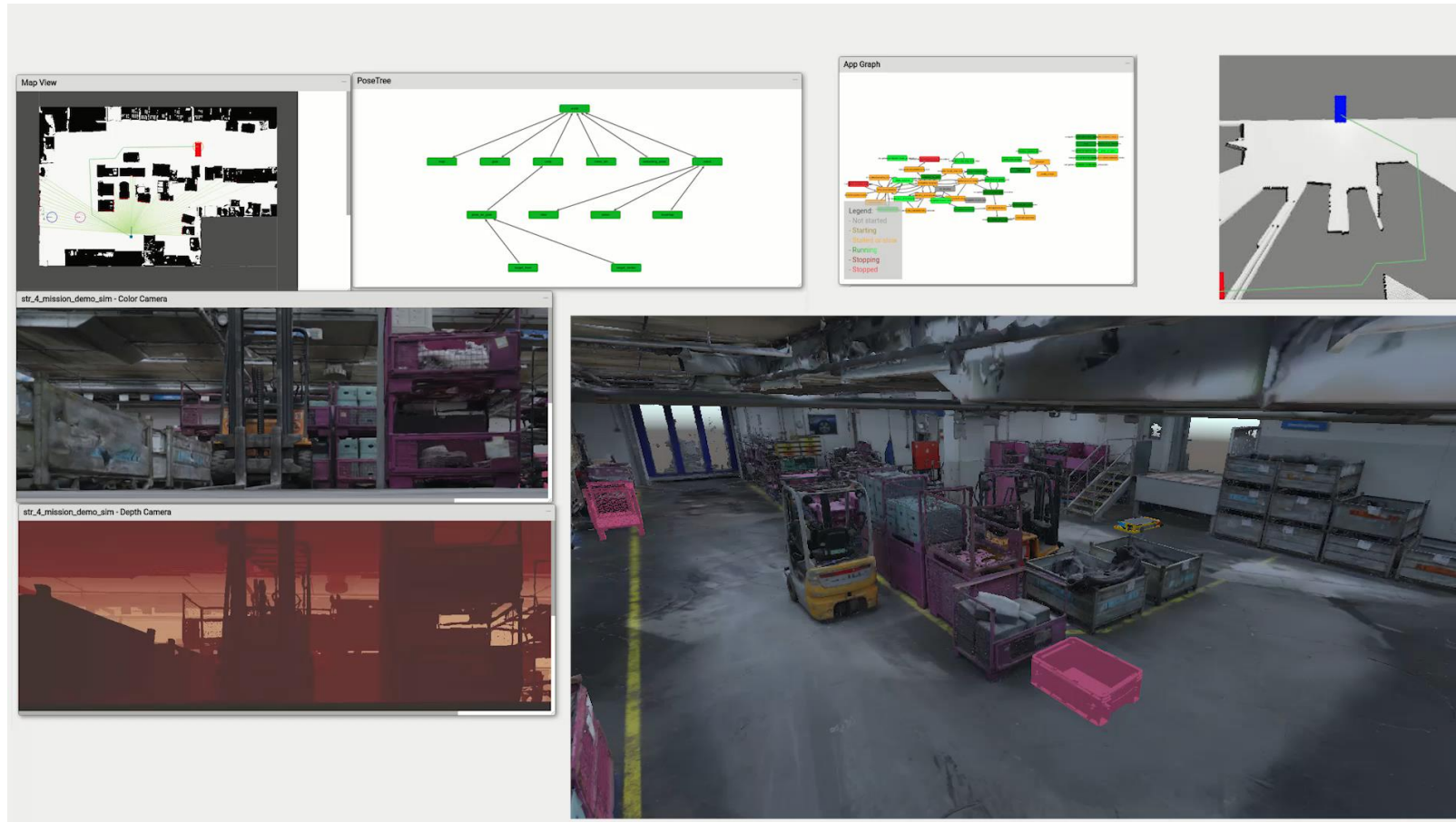
ROBOTICS MADE EASY WITH ISAAC

- ✓ Standardized reusable platform for all robotics & autonomous systems.
- ✓ Reduced development, AI training, testing and deployment cycle time.
- ✓ AI and GPU accelerated computing at the edge to enable more compute intensive features to enhance robot capabilities.
- ✓ Allows control over robot development pace and roadmap without depending on 3rd party.
- ✓ Reduces overall cost of robotics hardware and software.



BMW SMART TRANSPORT ROBOT (STR) AND ISAAC PLATFORM

Leveraging NVIDIA's Technology for Ultimate Industrial Autonomous Transport Robot



SMART TRANSPORT ROBOT (STR)

GAIT RECOGNITION AND CUSTOMIZED VIDEO ANALYTICS SOLUTIONS

At NoLeak, we develop advanced and customized video analytics solutions for several sectors, such as smart cities and defense.

Our main product is our unique Gait Recognition technology. We can identify any person from camera footage without their faces visible. This enables identifying masked criminals from crime videos using the criminal's body movement supporting regular and legacy cameras and low-resolution videos.



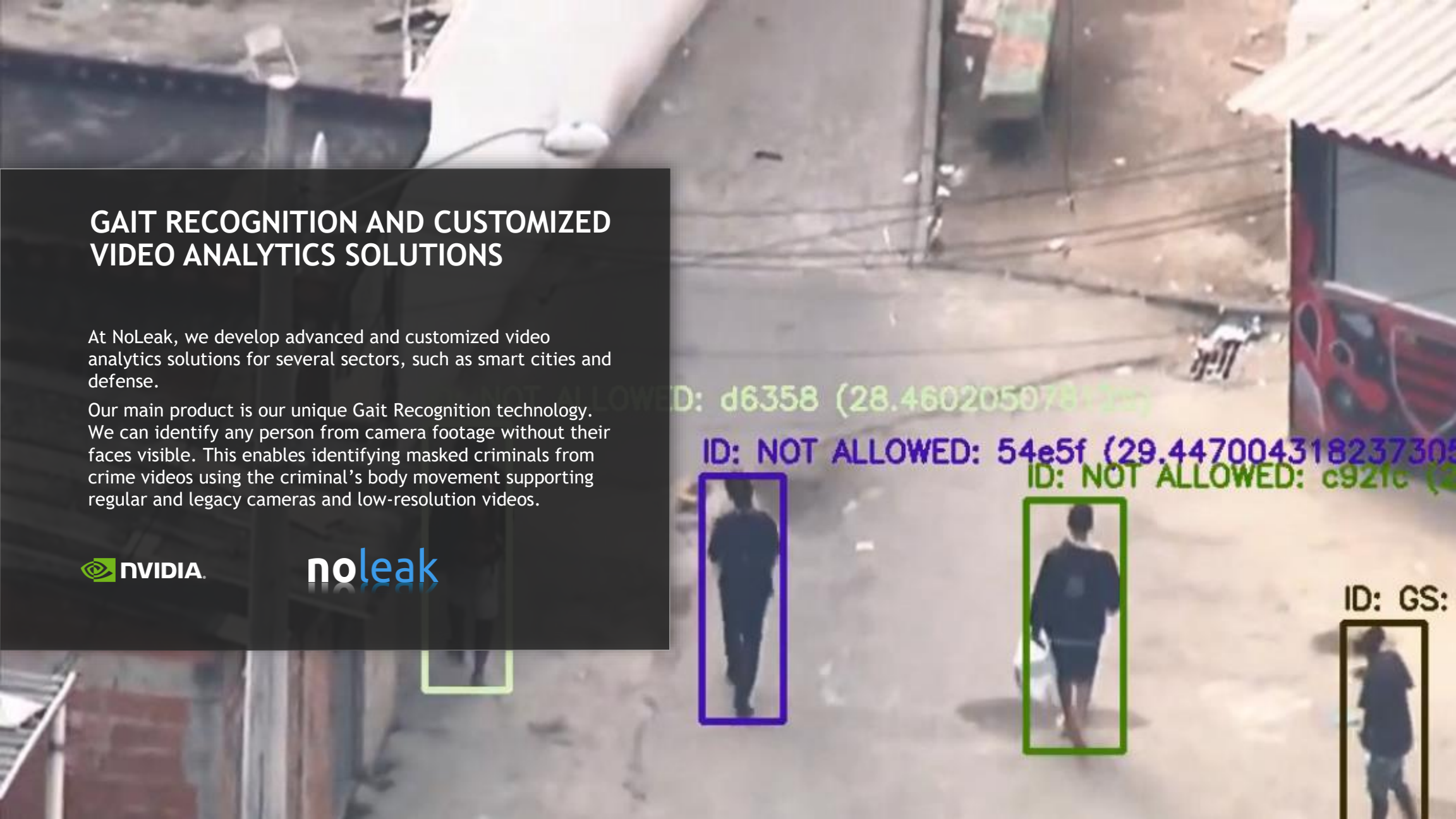
noleak

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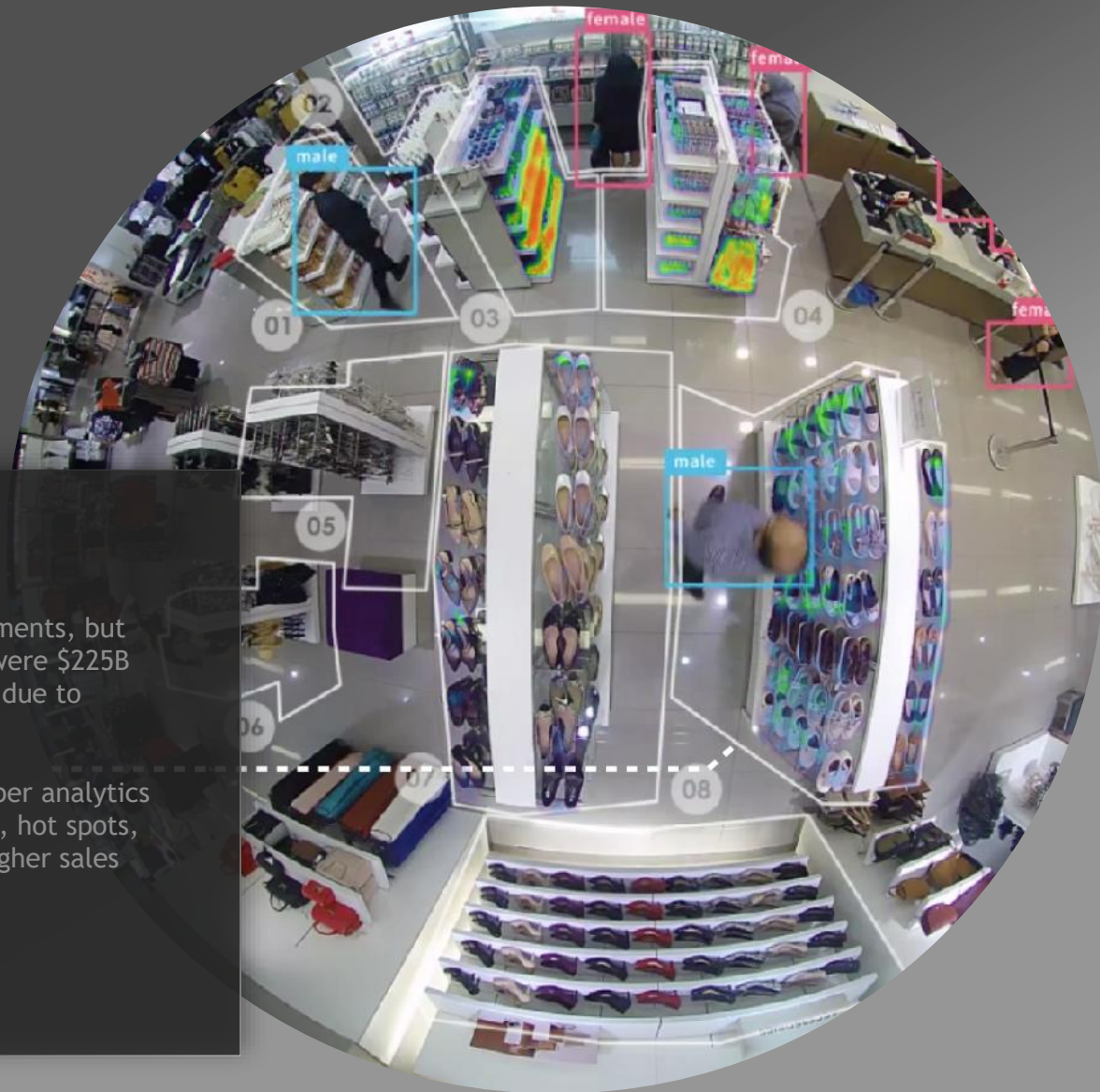
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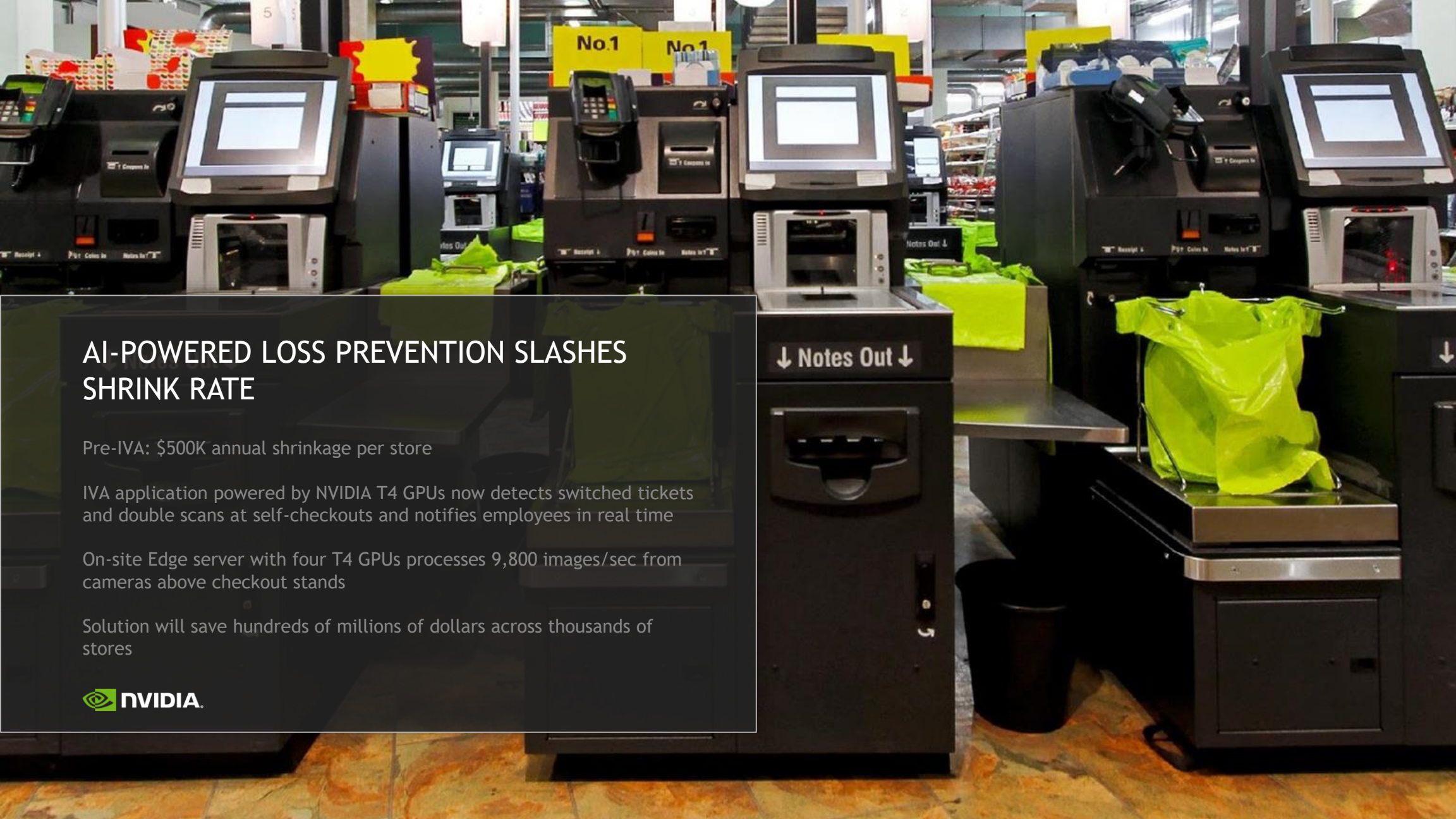


INCREASE SALES, REDUCE THEFT

Retailers have sophisticated programs to monitor online consumer engagements, but not so for in-store analytics. Additionally losses due to theft and damage were \$225B U.S. in 2017, but traditional loss-prevention solutions are ineffective—and due to privacy concerns, cannot be operated in the cloud.

SkyREC uses the NVIDIA JETSON TX2 to power its AI surveillance and shopper analytics solution so its customers can monitor shopper behavior with demographics, hot spots, cold zones and dwell points. SkyREC customer Timberland reported 30% higher sales revenue due to precision marketing.





AI-POWERED LOSS PREVENTION SLASHES SHRINK RATE

Pre-IVA: \$500K annual shrinkage per store

IVA application powered by NVIDIA T4 GPUs now detects switched tickets and double scans at self-checkouts and notifies employees in real time

On-site Edge server with four T4 GPUs processes 9,800 images/sec from cameras above checkout stands

Solution will save hundreds of millions of dollars across thousands of stores







AUTONOMOUS SHOPPING BY FRANCE'S LARGEST SUPERMARKET

French supermarket giant Carrefour is an early adopter of technology that sets it apart and boosts sales

Deployed checkout-free experiences at its grocery stores based on Nano Stores from AiFi

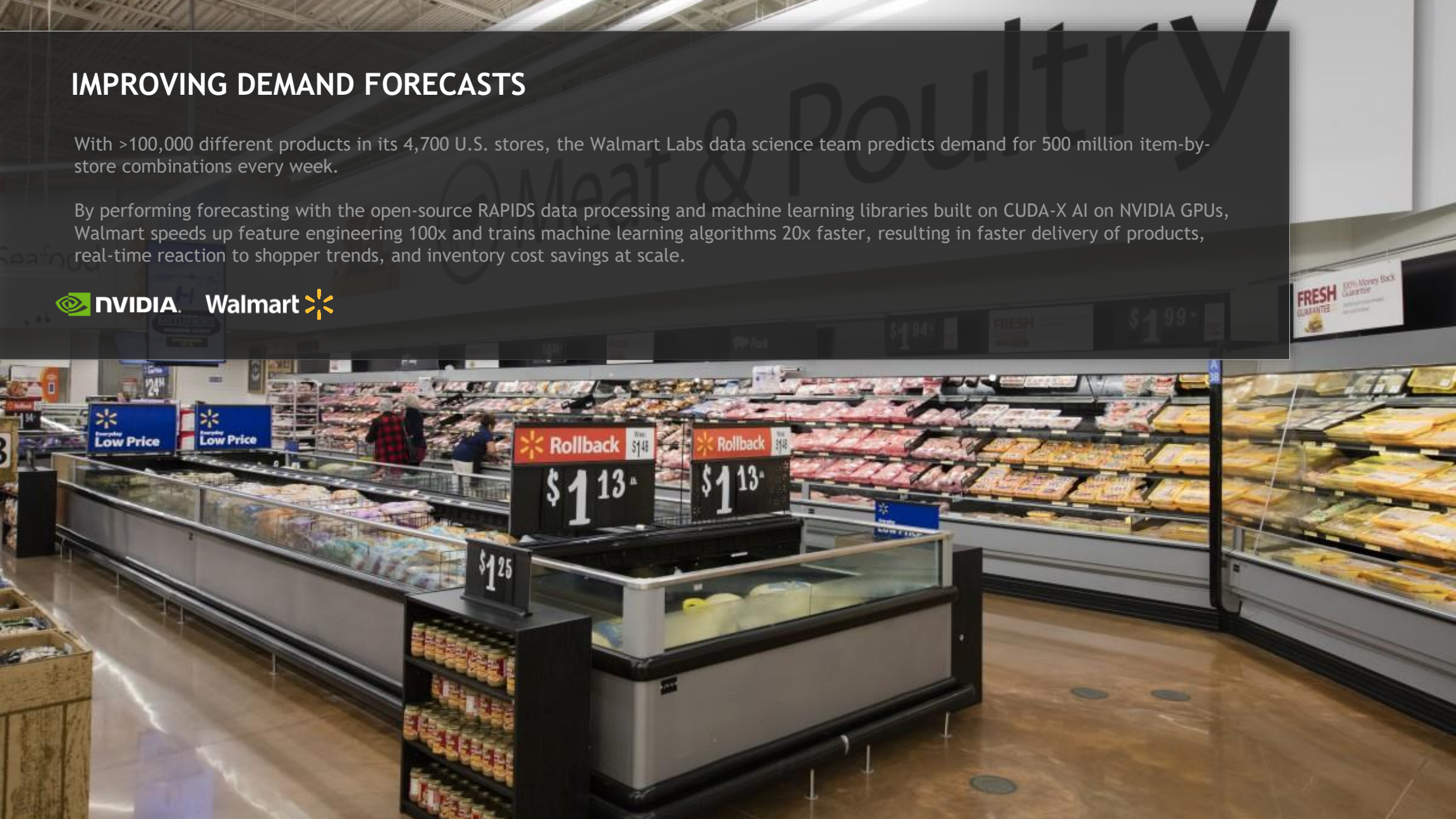
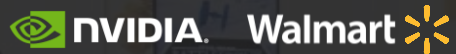
Carrefour can test promotions and new products in real time with AiFi's analytics on sales, inventory, and customer behavior

Customers enjoy a frictionless experience with the benefits of in-store and online shopping in one

IMPROVING DEMAND FORECASTS

With >100,000 different products in its 4,700 U.S. stores, the Walmart Labs data science team predicts demand for 500 million item-by-store combinations every week.

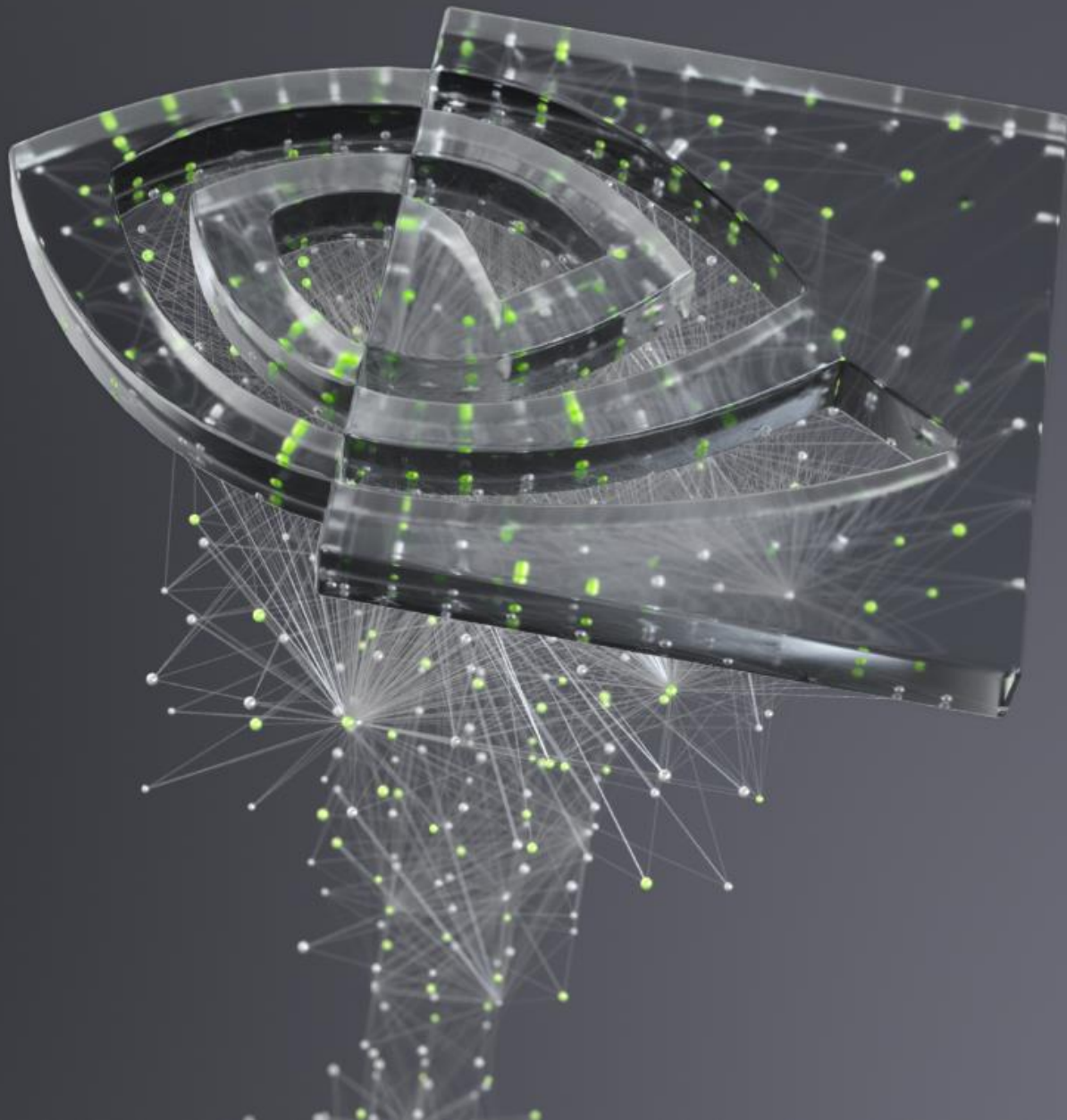
By performing forecasting with the open-source RAPIDS data processing and machine learning libraries built on CUDA-X AI on NVIDIA GPUs, Walmart speeds up feature engineering 100x and trains machine learning algorithms 20x faster, resulting in faster delivery of products, real-time reaction to shopper trends, and inventory cost savings at scale.





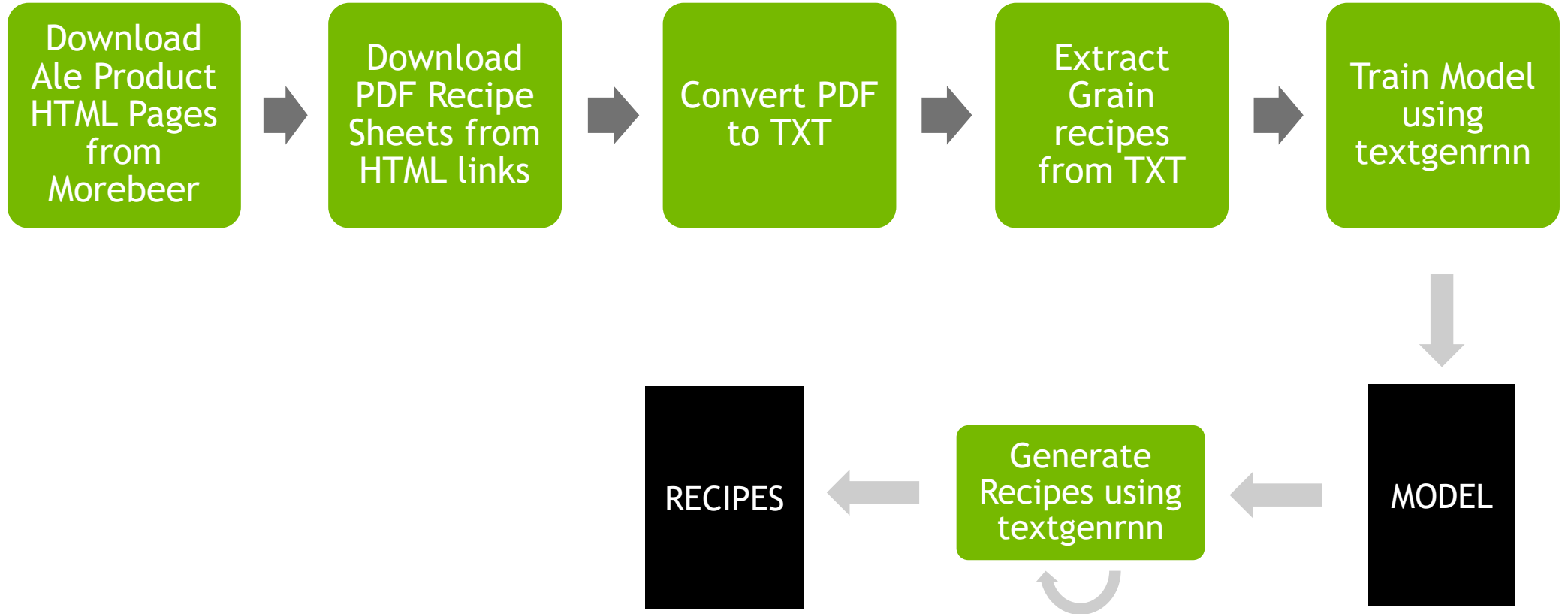
GENERATING BEER RECIPES WITH DEEP LEARNING

Eric Boucher



THE PROCESS

An overview



DOWNLOADING HTML PAGES FROM MOREBEER

All Grain Products

<https://www.morebeer.com/category/ales-2.html?page=1>

<https://www.morebeer.com/category/ales-2.html?page=2>

<https://www.morebeer.com/category/ales-2.html?page=3>

<https://www.morebeer.com/category/ales-2.html?page=4>

```
$ wget -r -l1 -I /products,/images -r
https://www.morebeer.com/category/ales-2.html?page=1
https://www.morebeer.com/category/ales-2.html?page=2
https://www.morebeer.com/category/ales-2.html?page=3
https://www.morebeer.com/category/ales-2.html?page=4
```

Products (153)

Displaying 1 to 48 of 153 products

Order By: Relevance

Page: [1] 2 3 4 »

♥ Show Favorite Products Only

Russian Rivers Pliny the Elder® - All Grain Beer Brewing Kit (5 Gallons)
★★★★★
72 Reviews
\$49.99

Haze Craze IPA - All Grain Beer Brewing Kit (5 Gallons)
★★★★★
54 Reviews
\$42.99

MoreHaze! Juicy Double IPA - All Grain Beer Kit
★★★★★
37 Reviews
\$51.99

German Hefeweizen - All Grain Beer Brewing Kit (5 Gallons)
★★★★★
21 Reviews
\$18.39 to \$22.99

Cali Mountain Pale Ale Clone - All Grain
★★★★★
7 Reviews
\$24.99

Citra® Session Pale Ale - All Grain Beer Brewing Kit (5 Gallons)
★★★★★
15 Reviews
\$25.99

Zombie Dust® Clone - Soulless Hop Pale Ale (All Grain)
★★★★★
15 Reviews
\$37.99

Hop Blonde - All Grain Beer Brewing Kit (5 Gallons)
★★★★★
26 Reviews
\$20.99

Irish Red Ale
★★★★★
7 Reviews
\$24.99

Dark Hill Porter
★★★★★
15 Reviews
\$25.99

Ugly Fish Tea
★★★★★
15 Reviews
\$37.99

Oatmeal Stout
★★★★★
26 Reviews
\$20.99

DOWNLOAD PDF RECIPE SHEETS

From Downloaded HTML Links

Python script

Looks for the recipe link
Recipe Sheet
in the downloaded HTML pages

And download the PDF file

Our recipe kits DO NOT include grain bags, yeast or priming sugar menu under "Yeast Options". For more info, click on the recommended unmilled base malts.

ABV %	8
IBU	200
SRM	10
Beer Style	IPA & Imperial IPA
Ready to Drink Within	2-4 Weeks
Alcohol Content	High (7-9%)
Bitterness	Very High (71ibu)
Fermentation Temp Range	64-72
Brewing Method	All Grain
Pre-Milled	Y

Documents

- [Brewing Instructions](#)
- [Recipe Sheet Pliny The Elder](#)

CUSTOM

Recipe Sheet Pliny The Elder

EXTRACT GRAIN RECIPES FROM TXT

Python script

Using regular expression text matching

Text has always the same format

Generate recipe with same consistent format

```
1 CUT THIS OUT FOR
2 YOUR TAP HANDLE
3 SUGGESTED YEAST
4 White labs: WLP001 English
5 Wyeast: 1056 British
6 SESSION BROWN ALE
7 GigaYeast: GY011 British Ale #1
8 A Signature Series Kit By The Brewing Network Imperial: A09 Pub
9 Fermentis Dry: US-04 English
10 EXTRACT (KIT739)
11 7 lbs Ultralight Malt Extract
12 SPECIALTY MALTS
13 1 lb Crystal 75L
14 8 oz Crystal 120L
15 8 oz Carafa II
16 8 oz Special Roast
17 8 oz Pale Chocolate
18 HOPS
19 1.5 oz Northern Brewer - Boil 60 min
20 0.5 oz Northern Brewer - Boil last 0 min
21 OTHER ADDITIONS
22 Clarifier - Boil last 5 min
23
24
25
26
```

```
ALL-GRAIN (KIT741)
8 lbs British Pale
SPECIALTY MALTS
1 lb Crystal 75L
8 oz Crystal 120L
8 oz Carafa II
8 oz Special Roast
8 oz Pale Chocolate
```

Name: brown ale brewing network, **Yeast:** WLP001, **Grains:** 128.0 oz British Pale, **Grains:** 8.0 oz Crystal 120L, **Grains:** 8.0 oz Carafa II, **Grains:** 8.0 oz Special Roast, **Grains:** 8.0 oz Pale Chocolate, **Hops:** 1.5 oz Northern Brewer - Boil 60 min, **Hops:** 0.5 oz Northern Brewer - Boil last 0 min, **Additions:** 0.0 oz Clarifier - Boil last 5 min

Train Model

Using Textgenrnn

108 Recipes. Not much but gave decent results

On CPU - Intel Core i7-8700K @ 3.70 Ghz, and 32 GB or RAM:

1 hour 45 minutes

On a NVIDIA QUADRO GV100 using CuDNN: 7 minutes



```
textgen.train_from_file(  
    file_path=TEXT_TRAIN,  
    new_model=True,  
    num_epochs=40,  
    gen_epochs=40,  
    batch_size=128,  
    rnn_layers=5,  
    rmm_size=128,  
    rnn_bidirectional=True,  
    #dim_embeddings=100,  
    #dropout=0.0,  
    max_length=40,  
    verbose=2  
)
```


Generate Recipes

Using Textgenrnn

Generated recipes using different temperatures, which represent the “creativity” of the generated text.

Most recipes were reasonable. Names are copied.

A few goofs like:

#6

Name: sierra nevada pale ale clone cali mountain, Yeast: WLP001, Grains: 176.0 oz 2-Row Pale, Grains: 8.0 oz Carapils, Hops: 1.0 oz Cascade - Boil 60 min, Hops: 1.0 oz Cascade - Boil last 5 min, Hops: 1.0 oz Cascade - Boil last 5 min, Hops: 2.0 oz Cascade - Boil last 10 min, Hops: 2.0 oz Witlameot, Hops: 1.0 oz Centennial - Boil Last 0 min at flameout, Hops: 1.0 oz Centennial - Boil Last 15 min, Hops: 0.5 oz Crystal - Boil Last 0 min, flameout, Hops: 12.0 oz Honey - Boil Last 15 min, Hops: 4.0 oz Simcoe - **Dry Hop after 45 days of pre primary fermentation**, Additions: 0.0 oz Clarifier - Boil last 5 min

```
txt=textgen.generate(  
    max_gen_length=1000,  
    return_as_list = True,  
    temperature=0.5  
)
```

```
2 TEMPERATURE = 0.75  
3 #0  
4 Name: snowflake smoked porter ray daniels, Yeast: WLP007, Grains: 192.0 oz 2-Row Pale, Grains: 4.0 oz Crystal 40L,  
  Grains: 4.0 oz Carafa Special II, Hops: 1.0 oz Perle - Boil 60 min, Hops: 1.0 oz Cascade - Boil Last 5 min, Additions:  
  0.0 oz Clarifier - Boil last 5 min  
5  
6 #1  
7 Name: english pale ale, Yeast: WLP002, Grains: 128.0 oz 2-Row Pale, Grains: 4.0 oz Caramel Munich, Grains: 48.0 oz  
  2-Row Pale, Grains: 8.0 oz Crystal 40L, Grains: 4.0 oz Acidulated, Hops: 0.5 oz Magnum - Boil 60 min, Hops: 1.0 oz  
  Cascade - Boil last 1 min, Additions: 0.0 oz Clarifier - Boil last 5 min  
8  
9 #2  
10 Name: kit canadian breakfast stout place holder, Yeast: WLP001, Grains: 208.0 oz 2-Row, Grains: 12.0 oz Roasted Barley,  
  Grains: 8.0 oz Chocolate, Grains: 4.0 oz Black Patent, Grains: 4.0 oz Chocolate, Hops: 1.0 oz Northern Brewer - Boil 60  
  min, Additions: 0.0 oz Clarifier - Boil last 5 min  
11  
12 #3  
13 Name: unicorn fart pale ale, Yeast: WLP001, Grains: 160.0 oz 2-Row Pale, Grains: 8.0 oz Carapils, Grains: 8.0 oz  
  Crystal 60L, Grains: 8.0 oz Victory, Grains: 4.0 oz Carapils, Grains: 4.0 oz Chocolate, Hops: 1.0 oz Northern Brewer -  
  Boil 60 min, Hops: 1.0 oz Northern Brewer - Boil Last 20 min, Hops: 0.5 oz Cascade - Boil Last 1 min, Hops: 2.0 oz  
  Centennial - Dry hop in primary fermentation, 3-7 days, Additions: 0.0 oz Clarifier - Boil last 5 min  
14  
15 #4  
16 Name: kolsch ale, Yeast: WLP029, Grains: 240.0 oz 2-Row Pale, Grains: 8.0 oz White Wheat, Grains: 8.0 oz Chocolate,
```

BREW DAY

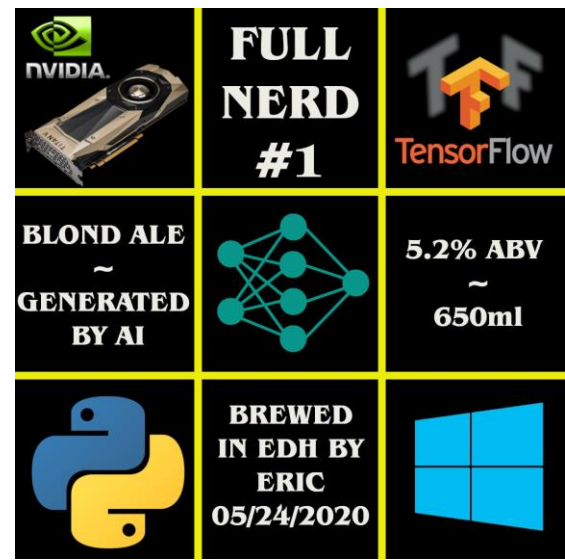
With the Help of BeerSmith3 and Tilt

Validated a few generated recipes using [Beersmith](#), so check color, bitterness ratio, alcohol level etc...

Chose that one to enjoy during summer and named it [Full Nerd #1](#)

Yeast: WLP001,
Grains: 144.0 oz 2-Row Pale, 8.0 oz Crystal 10L, 8.0 oz Carapils,
Hops: 0.5 oz Warrior - Boil 60 min, 1.0 oz Cascade - Boil 20 min, 2.0 oz AMARILLO - Boil last 1 min,
Additions: Clarifier - Boil last 5 min

Used the [Tilt Hydrometer](#) to monitor the fermentation





AI HELPS DOMINO'S PREDICT WHEN THREE BILLION PIZZAS ARE READY FOR PICKUP

Domino's, a leader in pizza delivery, has over 17,000 stores worldwide and delivers more than 3 billion pizzas a year.

The company is using AI to improve order readiness accuracy, delivery routing, and marketing outreach.

With NVIDIA DGX-1 servers Domino's trains complex models, iterates quickly, and scales services. Training time improved 72x and order readiness prediction is now 95% accurate.

An AI-based "Points for Pie" campaign drove crowdsourced images to provide volume for model training, while increasing customer engagement and loyalty.



