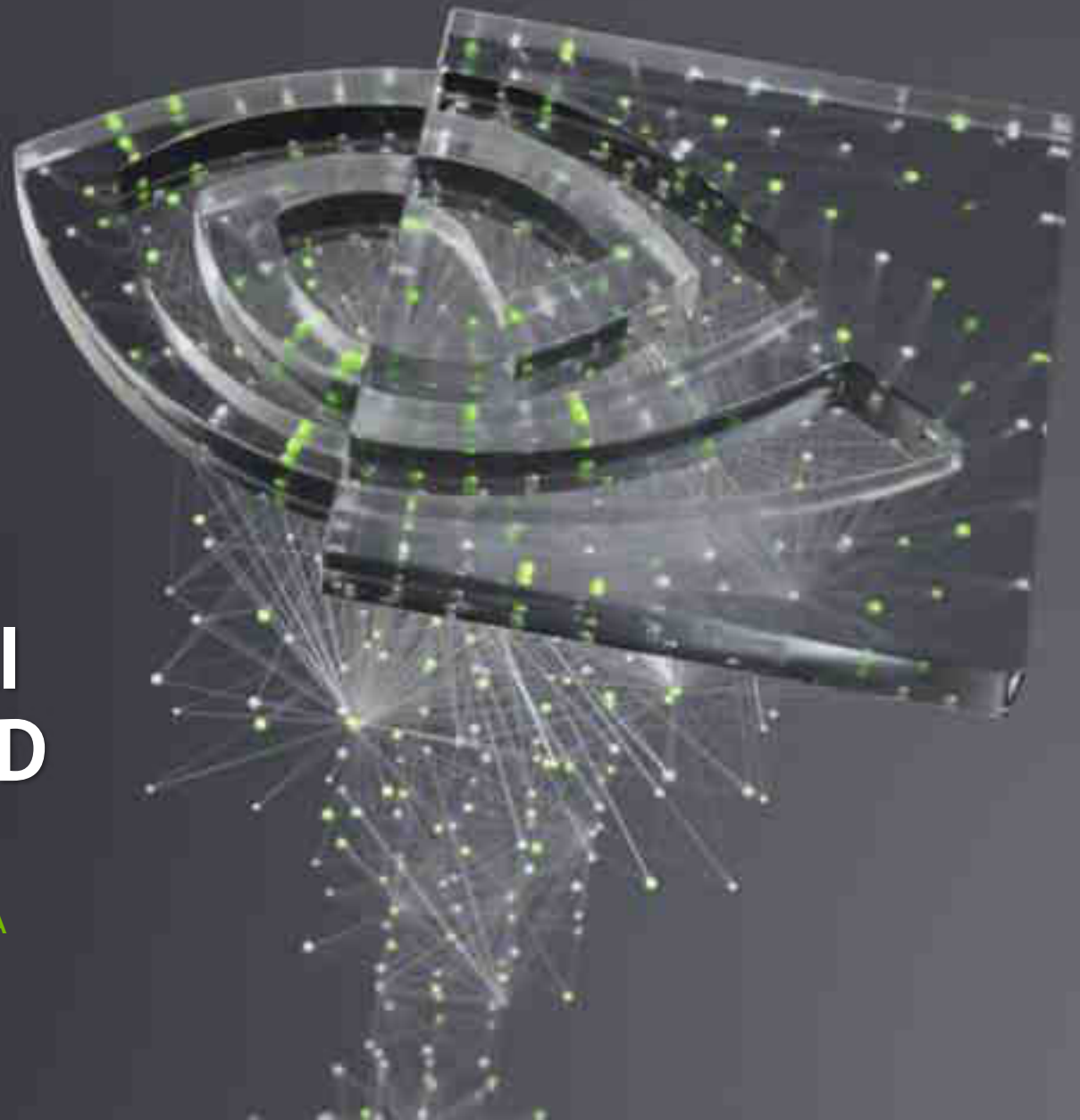


APPLICATIONS OF AI IN SMART CITIES AND INDUSTRY 4.0

Nicolas Walker, Senior Solutions Architect @ NVIDIA

FSI

FSI INDUSTRY CHALLENGES

AI lowers customer service costs by up to 95%

Financial Pressure

Increasing risk drove the country's largest banks to set aside over $45B in cash reserves

Digital Engagement Accelerates

Banks must invest in digital channels to succeed in today's Covid-19 environment

Customer Service Demand Spikes

Consumer calls to banks have grown significantly due to changes in employment, government programs and the economy.

ACCELERATING DIGITAL TRANSFORMATION IN FSI

AI/ML optimizes performance and outcomes

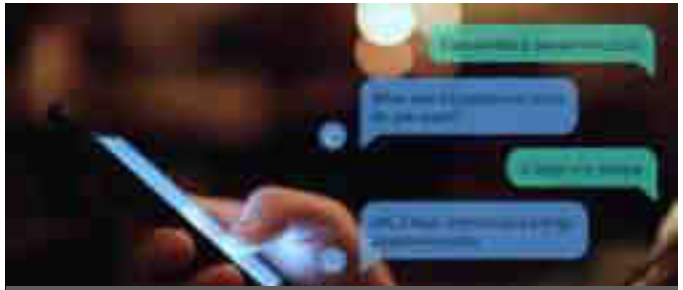
DEFAULT PREDICTION/
APPLICATION UNDERWRITING

CAPITAL MARKETS

FRAUD / KYC / AML

DIGITAL PAYMENTS

RECOMMENDATIONS



CUSTOMER SERVICE/EXPERINCE CX

VIRTUALIZATION/REMOTE (WFH)

FINANCIAL SERVICES & AI ENABLED CUSTOMER ENGAGEMENT

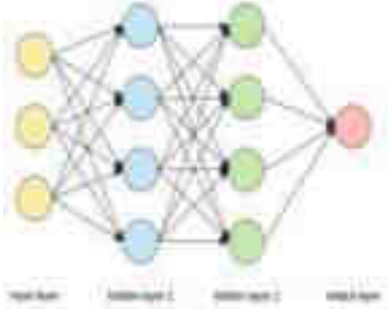
Call Center Transcription / ASR
Deliver better customer services outcomes from natural language inputs

Virtual Financial Assistants
Chatbots offer an interactive customer support experience powered by AI

Easy Digitization (Voice, Text)
Increase application conversion rates for extracted Documents via Natural Language for Business CX, risk and regulatory compliance

Virtual Teller Machines
VTMs may employ AI-powered virtual avatars to support customers.

Content Analysis
Analyze video and audio content instantly for better customer service outcomes

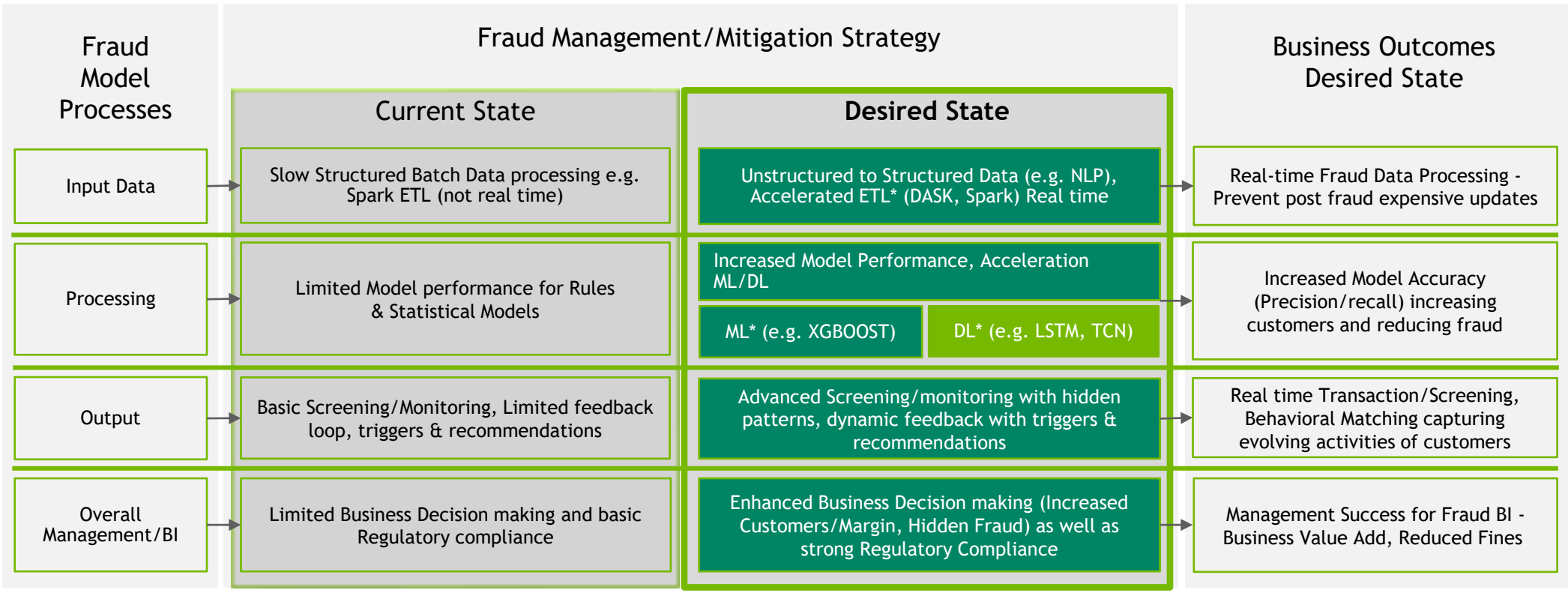


Recommendation Systems
Improve application conversion rates, risk management and regulatory compliance

PAYMENTS ECOSYSTEM

TRANSACTION FRAUD MODEL PROCESSES

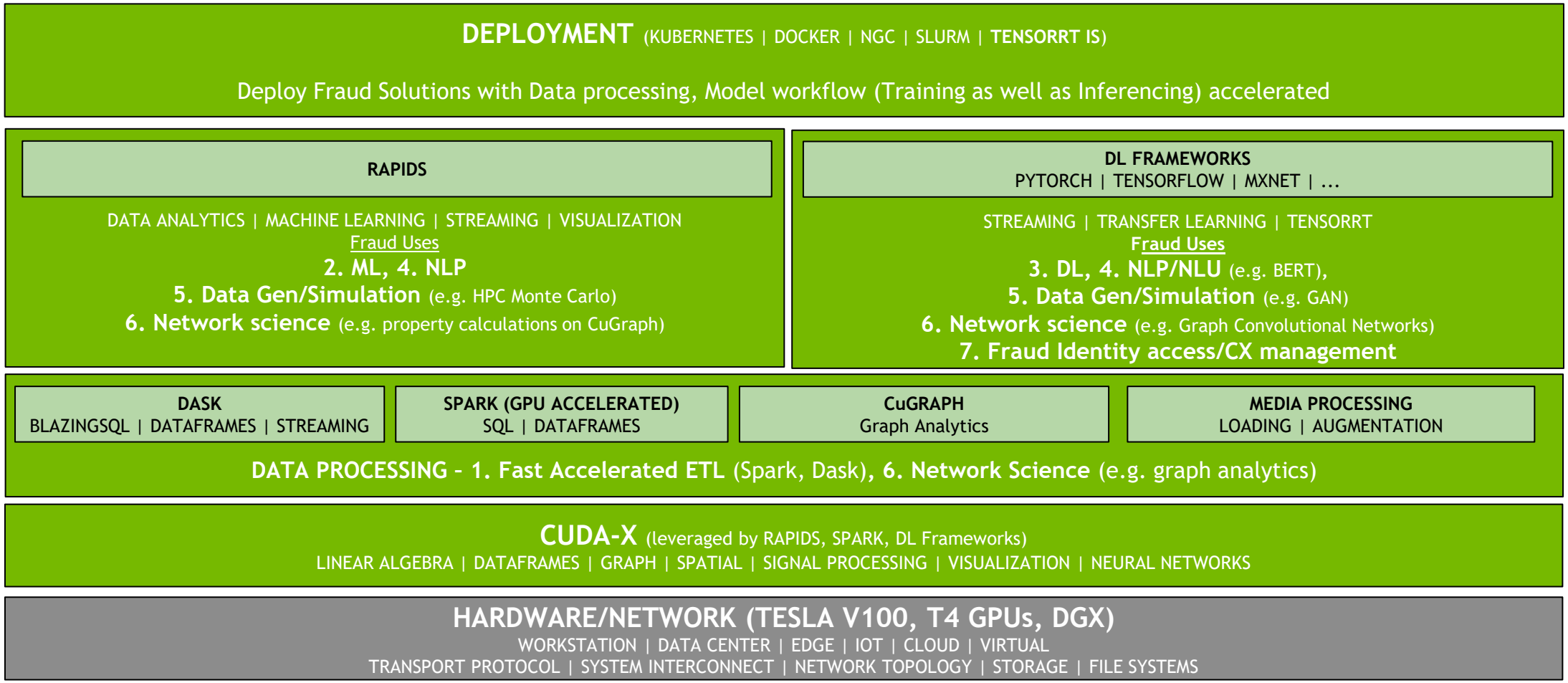
Migration - Current vs. Desired



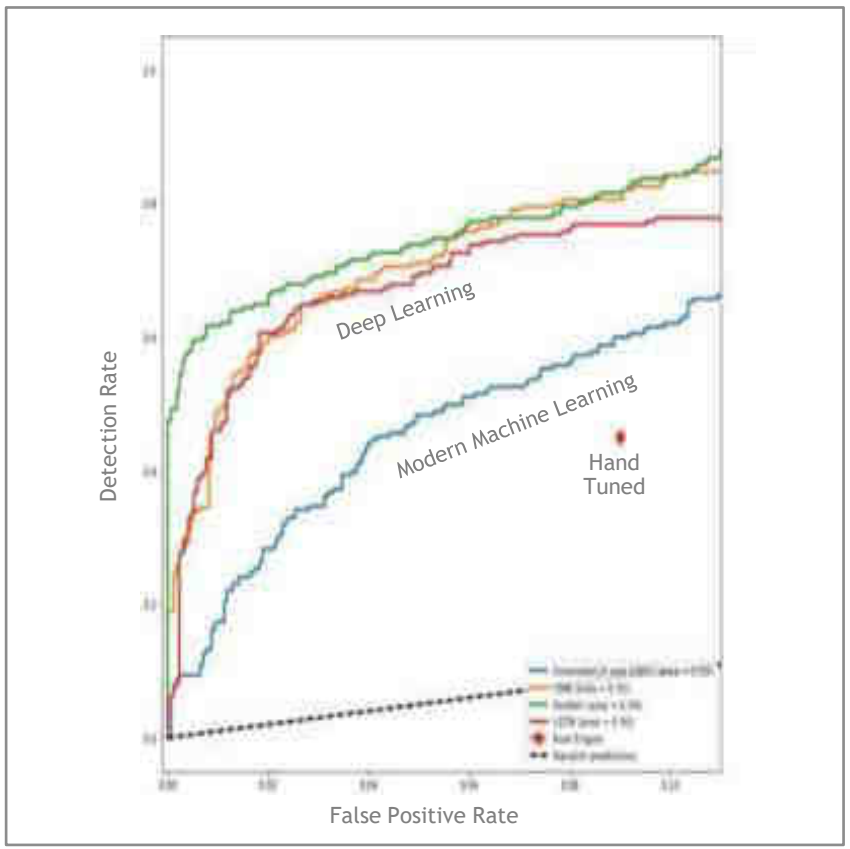
*ETL Data Preparation (RAPIDS.ai on Dask/Spark), *ML (RAPIDS.ai), *DL (PYTORCH, TENSORFLOW)

NVIDIA DATA SCIENCE PLATFORM

Fraud Implementation Illustrative reference



Note: Numbered use cases are presented in the previous slide



AI POWERED FRAUD DETECTION

The Impact of Transaction Fraud

Fraud Detection

- Nearly $33 billion in estimated losses in 2019
- Fraud impacts merchants, card issuers, and consumers
- Every $1 of fraud costs $2.90 to the financial institution overall
- 67% of firms state false positives are more costly than actual fraud to their business; Need better model precision

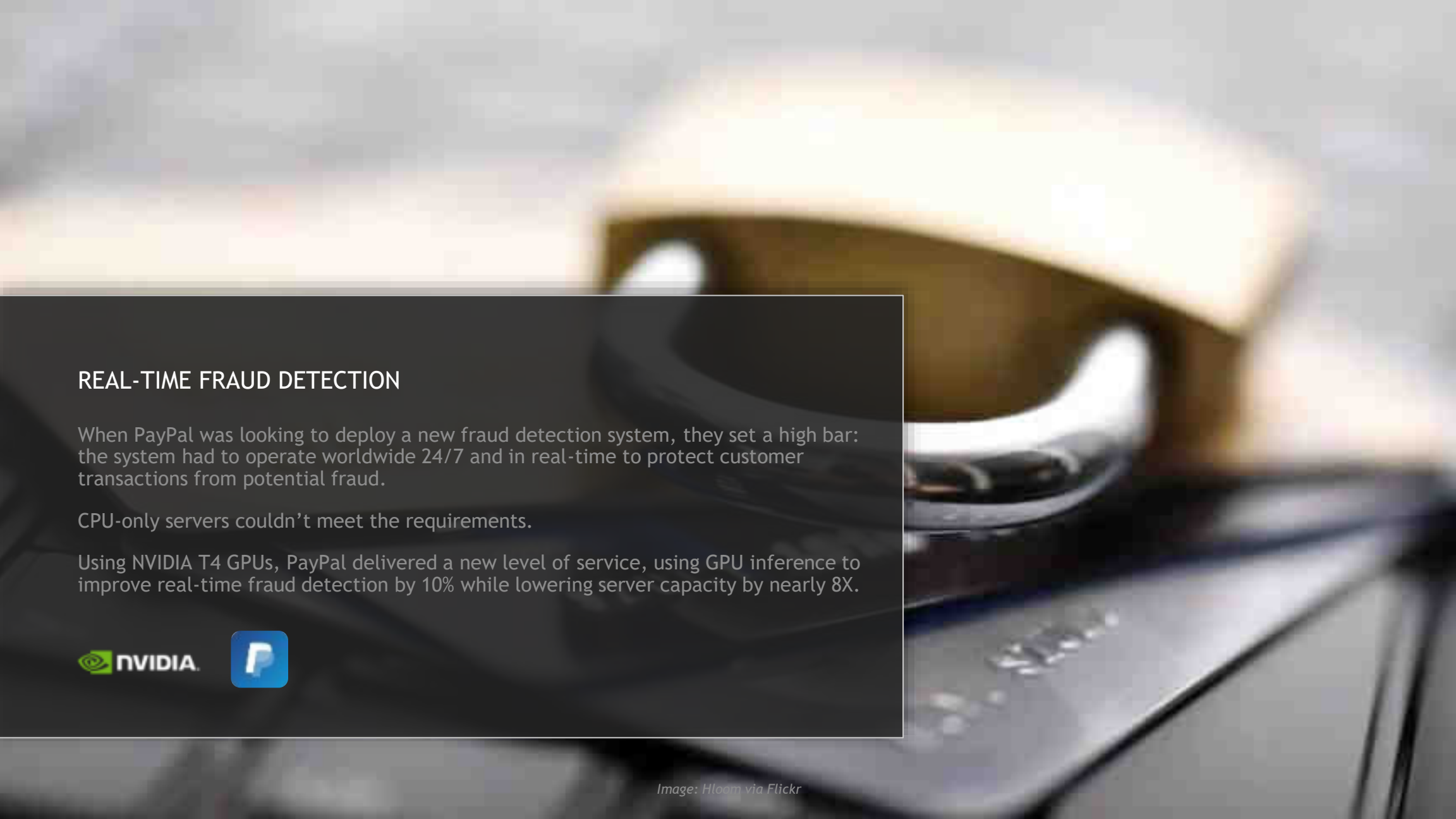
How AI Can Help:

- Reducing overall false positives while catching more actual fraud

Why NVIDIA:

- Efficient use of data scientist resources with NVIDIA CUDA-X AI
- Faster training to keep up with everchanging fraud risks
- Reduced Opex and Capex of infrastructure

https://www.aba.com/-/media/archives/endorsed/rippleshot-state-of-card-fraud.pdf
https://www.experian.com/assets/decision-analytics/reports/global-fraud-report-2018.pdf
Image source: ttps://conferences.oreilly.com/artificial-intelligence/ai-ny-2017/public/schedule/detail/59252



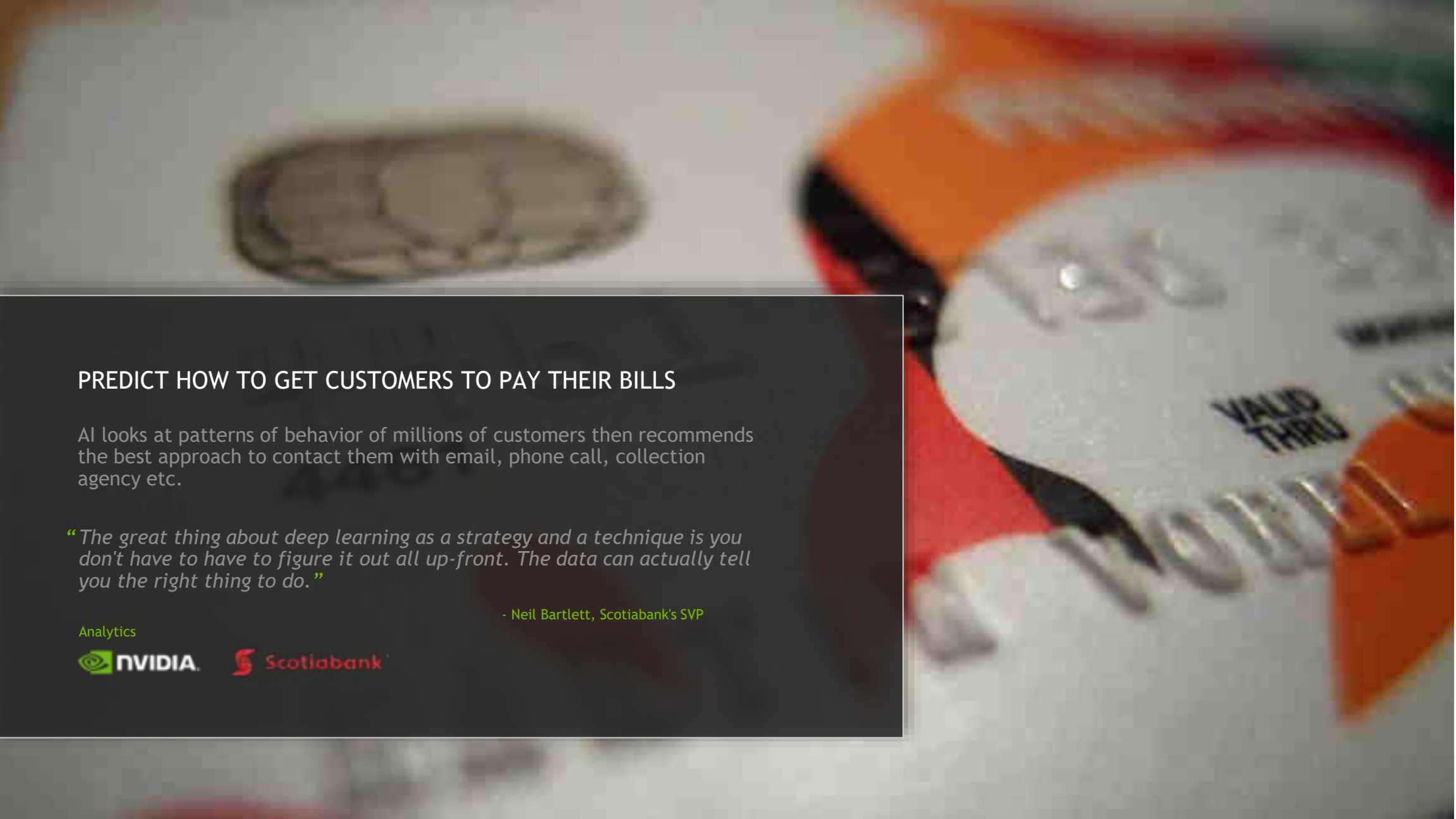
REAL-TIME FRAUD DETECTION

When PayPal was looking to deploy a new fraud detection system, they set a high bar: the system had to operate worldwide 24/7 and in real-time to protect customer transactions from potential fraud.

CPU-only servers couldn't meet the requirements.

Using NVIDIA T4 GPUs, PayPal delivered a new level of service, using GPU inference to improve real-time fraud detection by 10% while lowering server capacity by nearly 8X.

Image: Hloom via Flickr



PREDICT HOW TO GET CUSTOMERS TO PAY THEIR BILLS

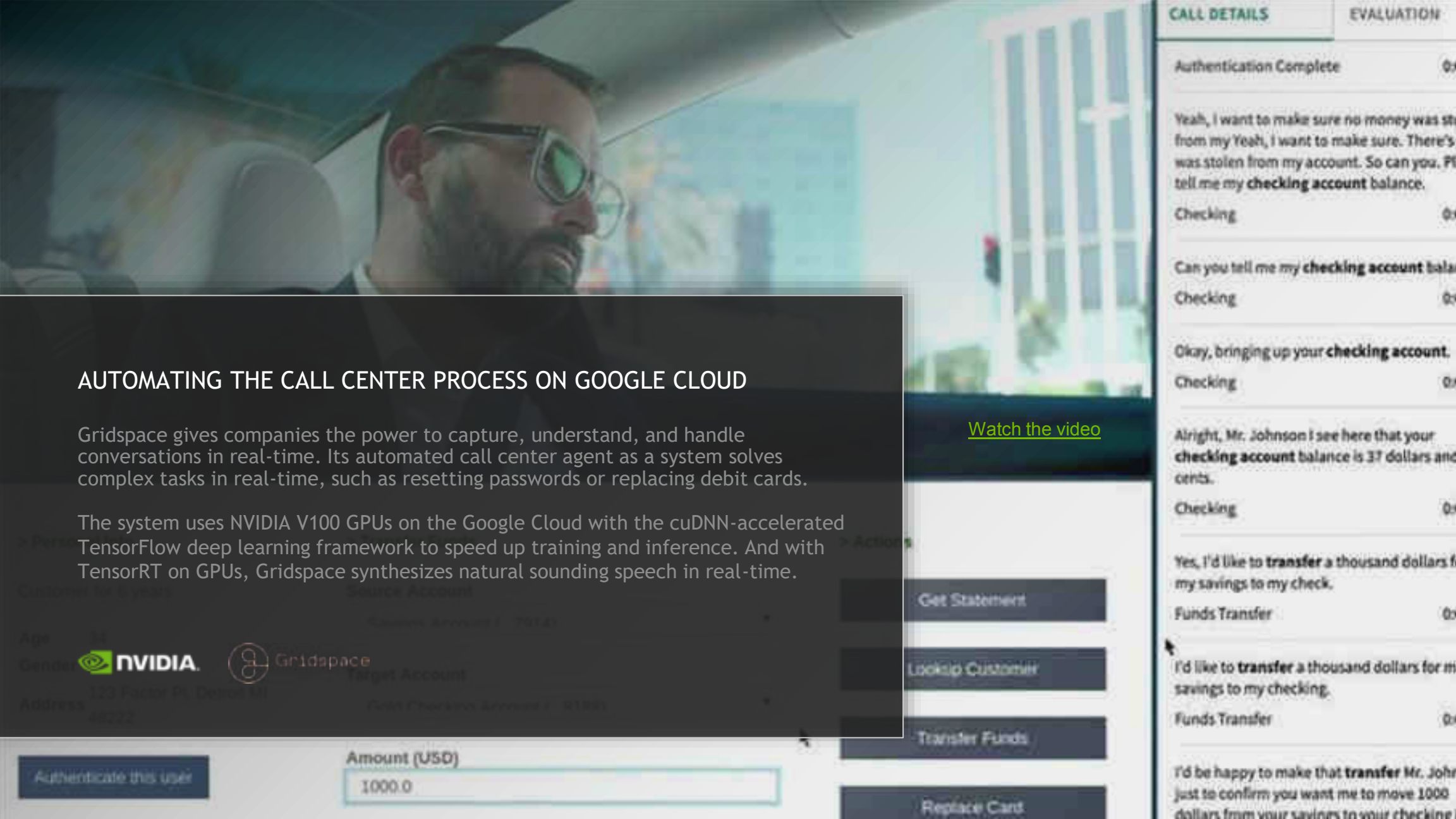
AI looks at patterns of behavior of millions of customers then recommends the best approach to contact them with email, phone call, collection agency etc.

"The great thing about deep learning as a strategy and a technique is you don't have to have to figure it out all up-front. The data can actually tell you the right thing to do."

- Neil Bartlett, Scotiabank's SVP

Analytics

NVIDIA Scotiabank



AUTOMATING THE CALL CENTER PROCESS ON GOOGLE CLOUD

Gridspace gives companies the power to capture, understand, and handle conversations in real-time. Its automated call center agent as a system solves complex tasks in real-time, such as resetting passwords or replacing debit cards.

The system uses NVIDIA V100 GPUs on the Google Cloud with the cuDNN-accelerated TensorFlow deep learning framework to speed up training and inference. And with TensorRT on GPUs, Gridspace synthesizes natural sounding speech in real-time.

NVIDIA Gridspace

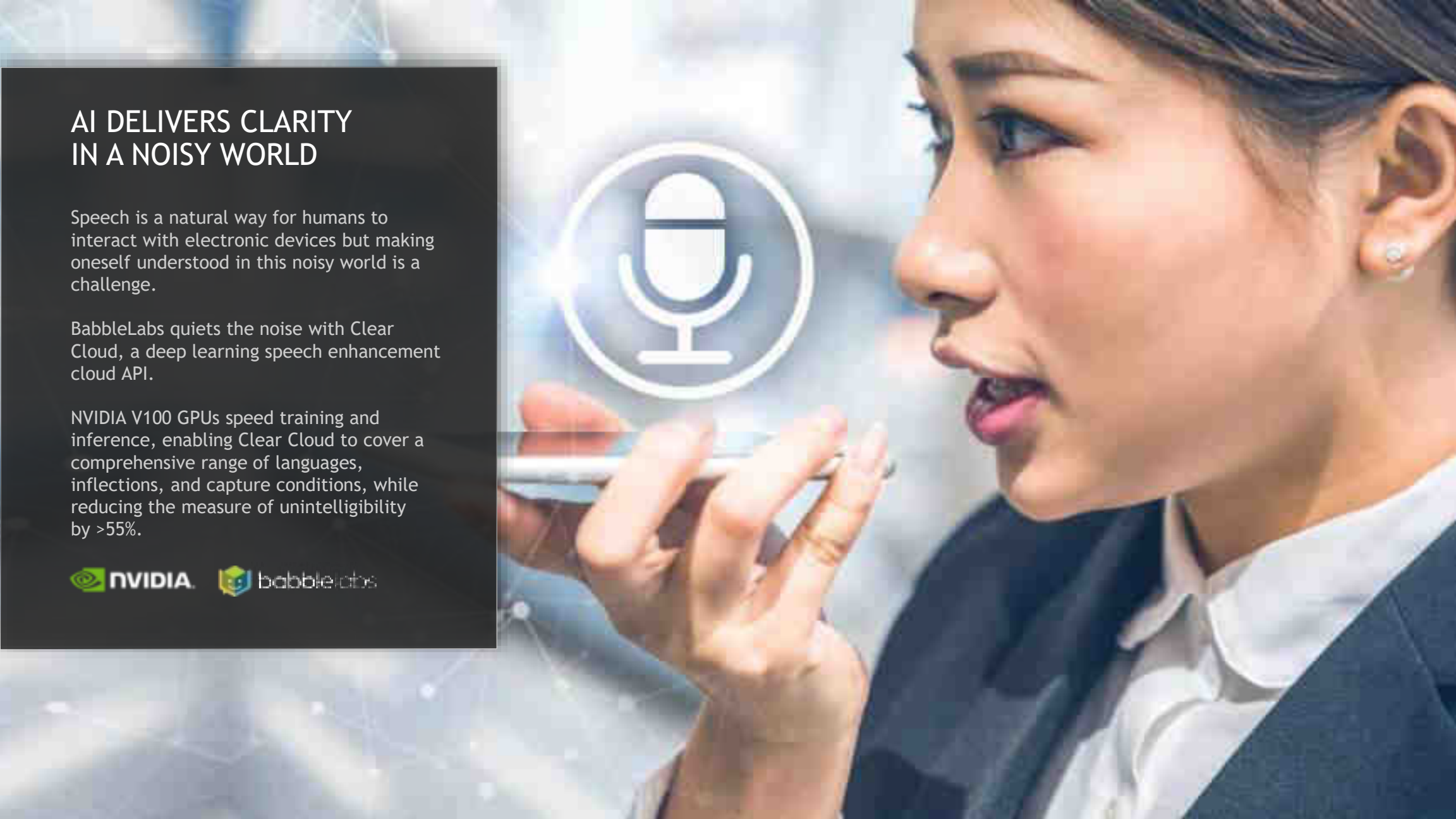
AI DELIVERS CLARITY IN A NOISY WORLD

Speech is a natural way for humans to interact with electronic devices but making oneself understood in this noisy world is a challenge.

BabbleLabs quiets the noise with Clear Cloud, a deep learning speech enhancement cloud API.

NVIDIA V100 GPUs speed training and inference, enabling Clear Cloud to cover a comprehensive range of languages, inflections, and capture conditions, while reducing the measure of unintelligibility by >55%.

NVIDIA babblelabs



AUTOMATED CUSTOMER VERIFICATION WITH VOICE RECOGNITION

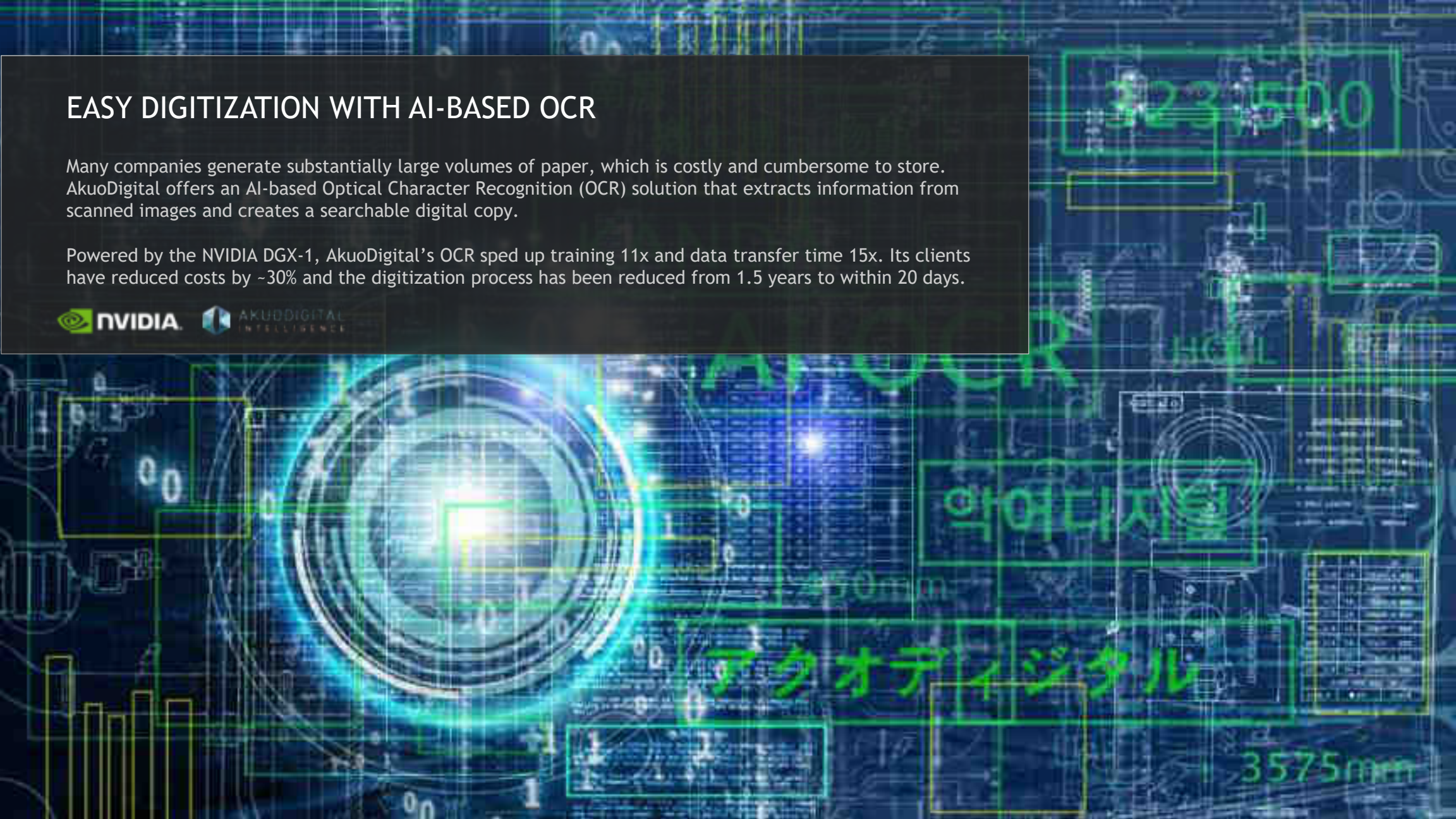
Ping An receives 40 million calls per year, with half of them requiring up to 4 minutes to verify the identity of the caller. With NLP, Ping An hopes to use voice recognition to verify customer identity in ~5 seconds.

NVIDIA 中国平安 PING AN

EASY DIGITIZATION WITH AI-BASED OCR

Many companies generate substantially large volumes of paper, which is costly and cumbersome to store. AkuoDigital offers an AI-based Optical Character Recognition (OCR) solution that extracts information from scanned images and creates a searchable digital copy.

Powered by the NVIDIA DGX-1, AkuoDigital's OCR sped up training 11x and data transfer time 15x. Its clients have reduced costs by ~30% and the digitization process has been reduced from 1.5 years to within 20 days.

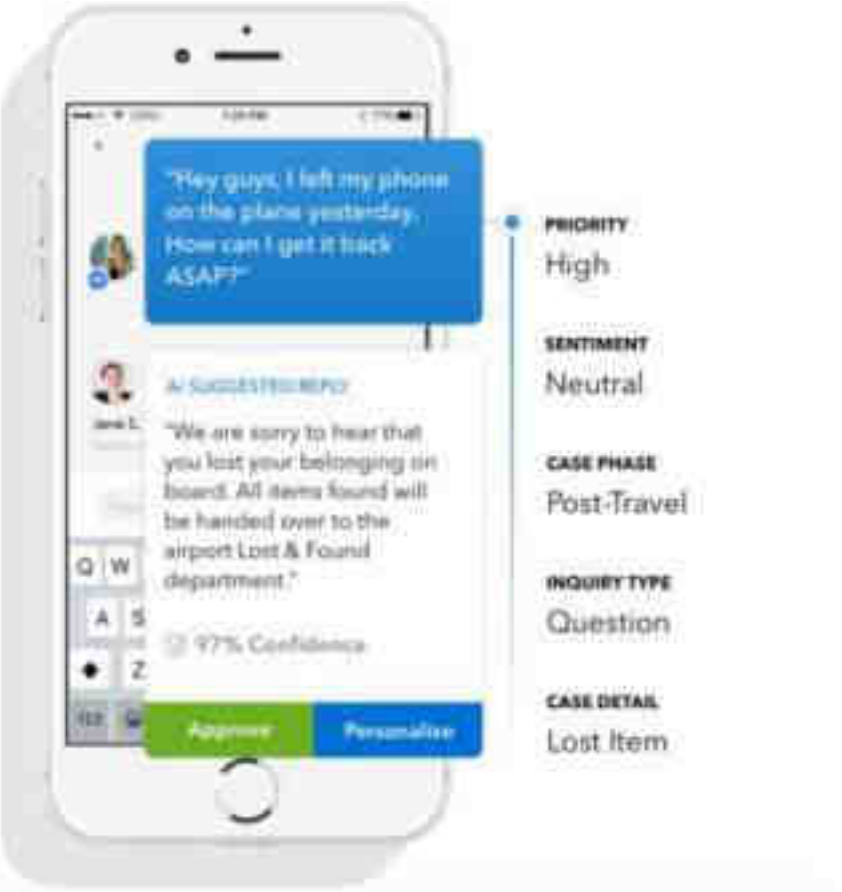


AI TOOL BOOSTS CUSTOMER SERVICE

KLM's 350+ social media service agents handle 15K requests/week. To support the volume of incoming messages, KLM uses GPU-accelerated deep learning to predict the best response.

Service agents review and either approve or personalize each response. The resulting time savings allows agents to focus on customers with more pressing needs and handle more questions while maintaining high levels of customer satisfaction.

NVIDIA DigitalGenius KLM



AUTOMATED INSURANCE CLAIMS

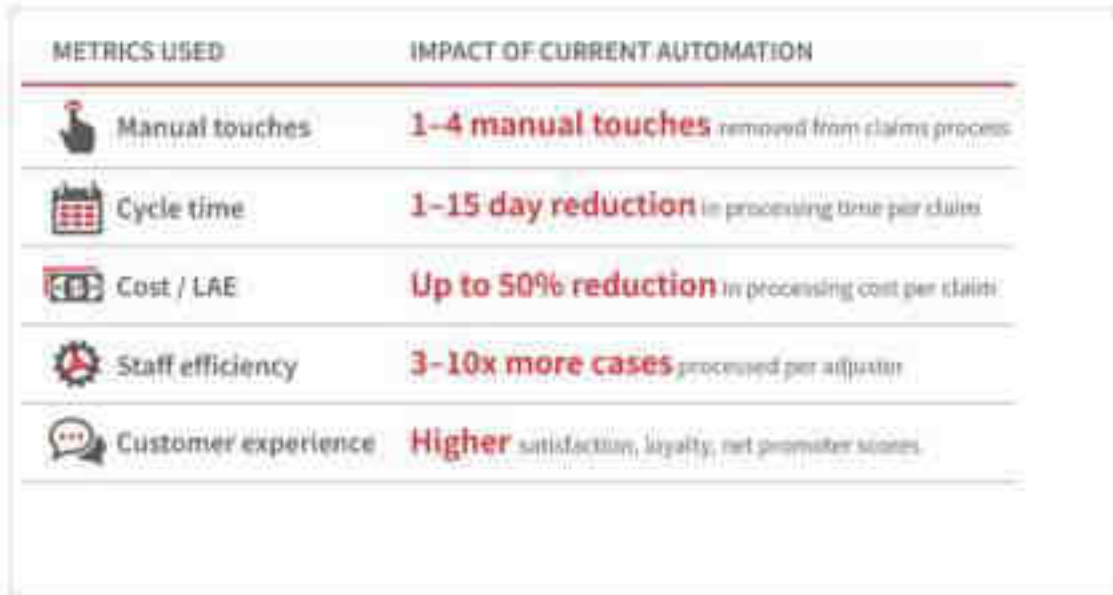
Lower costs and improved customer experience

Insurance company concerns:

- Have employees add value to customers.
- Streamline claims process for customers.
- Reduce overall expense of service.

Outcome of moving to AI:

- Proving out to have dramatic improvement.
- 79% of Insurance execs willing to move to automated claims, up ~50% year over year.



https://blogs.lexisnexis.com/insurance-insights/2018/12/touchless-claims-automation/

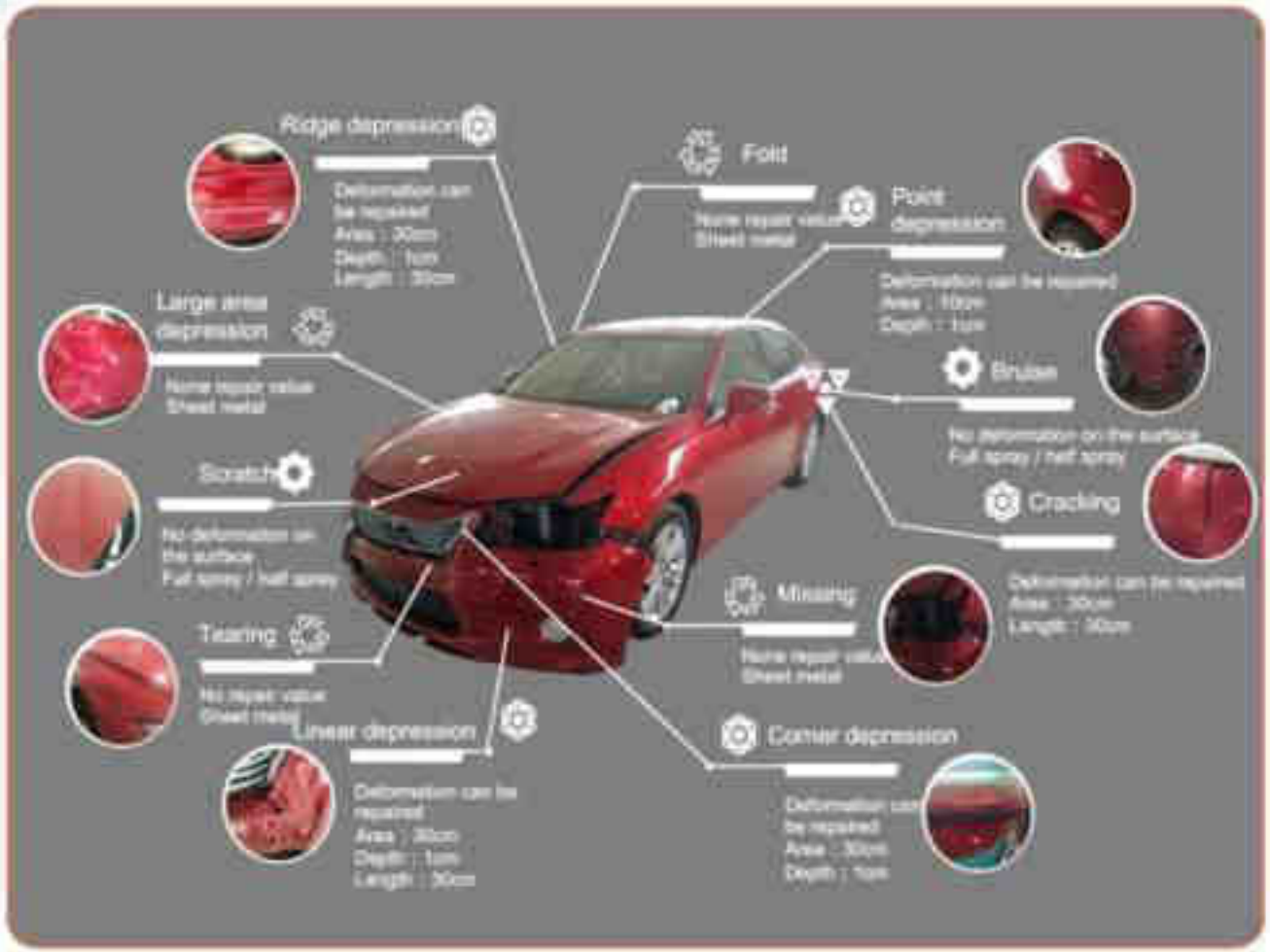
AI FOR PROCESS AUTOMATION

#1 INSURANCE COMPANY GLOBALLY, 150M CUSTOMERS

Car Damage Estimation

- Identify car damage quickly by using image analysis
- Estimate costs
- Helps to avoid car insurance claims fraud
- 31,000 Claims / Day
- 98.7% Paid out in less than a day

中国平安
PING AN



https://on-demand-gtc.gputechconf.com/gtcnew/sessionview.php?sessionName=s9863-financial+services+transformation+with+intelligent+cognitive

NVIDIA

SMART CITIES

AI REVOLUTION

Measuring Utilization of Space is More Critical Than Ever

Traffic Management

Retail

Factories

Public Safety & Health

Warehouse & Logistics

Stadiums & Casinos

Access Control

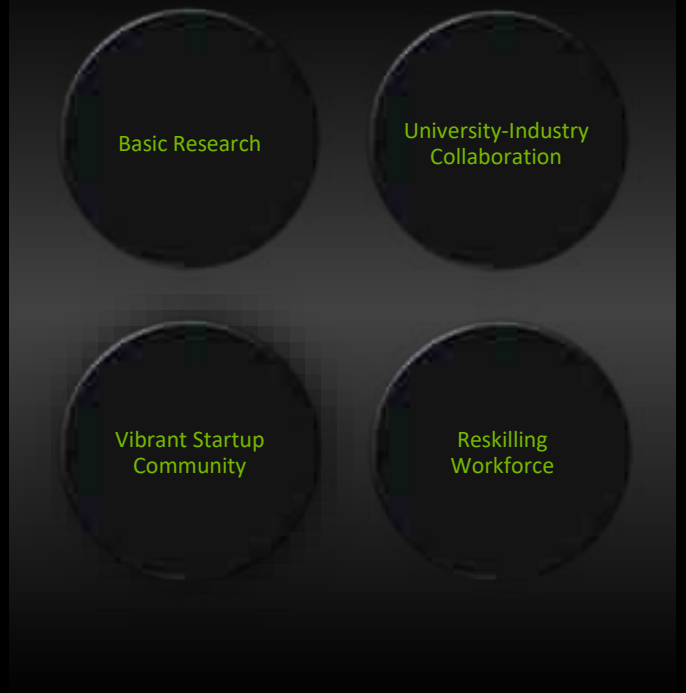
Transportation Hubs

$2T INDUSTRY — Increase operational efficiency and safety across many industries using AI

PILLARS OF NATIONAL AI INITIATIVES

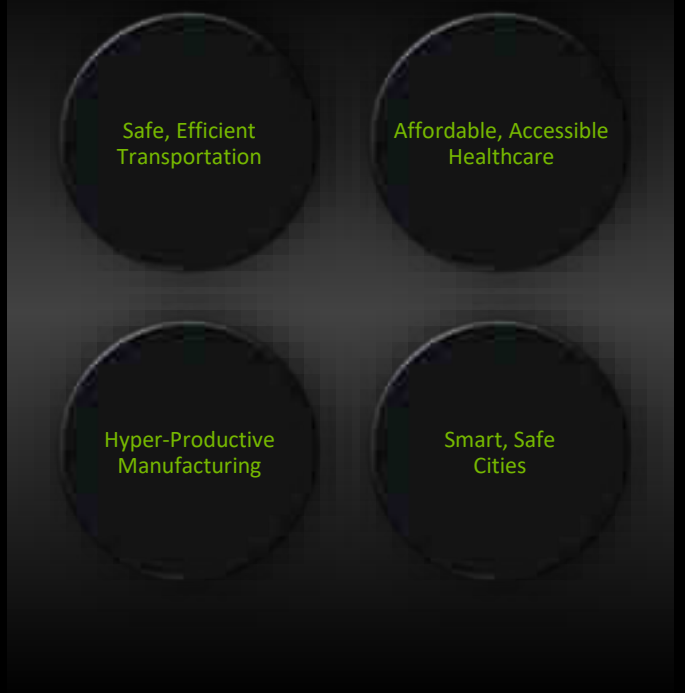
AI CENTERS OF EXCELLENCE

Starting the AI economy requires knowledge and skills, which require computing infrastructure, which can be afforded only if there is demand. Government can kick-start this virtuous cycle by providing access to large-scale AI computing infrastructure to its universities, startups, and industry.



SKILLING AND RESKILLING

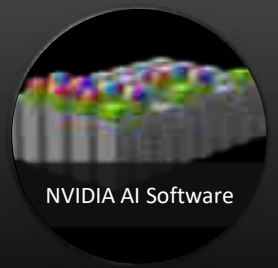
AI will accelerate job growth, but harnessing it requires specific skills and expertise. Countries need to invest in training and education programs that add AI skills to their workforce.

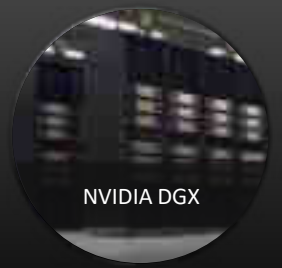


INDUSTRY SOLUTIONS

By investing in key industries, countries have a unique opportunity to drive growth and solve their greatest social and economic challenges.

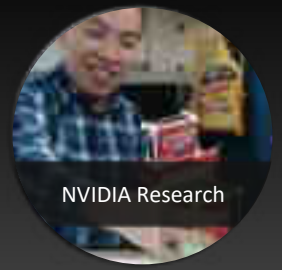
NVIDIA PARTNERSHIP FRAMEWORK FOR AI NATIONS

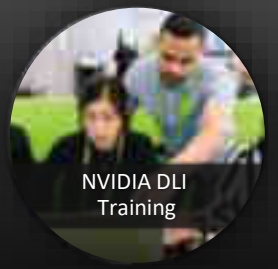




TECHNOLOGY & ECOSYSTEM

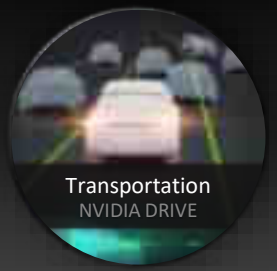
NVIDIA's AI computing hardware and software are the most advanced in the world. And our GPUs are offered by every computer maker and are in every cloud.

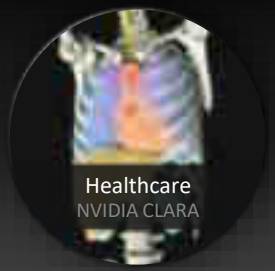




EXPERTISE & INVESTMENT

NVIDIA boasts some of the best minds in AI research. Our NVIDIA AI Lab (NVAIL) education program fosters AI in universities. Our Inception program fuels AI startups. Our Deep Learning Institute (DLI) trains individuals for the jobs that AI is creating.





INDUSTRY SOLUTION PLATFORMS

Our four industry platforms combine our technologies and ecosystems to help governments advance society's foundational industries.

COVID-19 RISK MITIGATION APP PACK

IntelliSite — Human-based Temp Detection

- Turnkey Solution
- Managed Service
- AI & GPU powered
- Personalized Portals

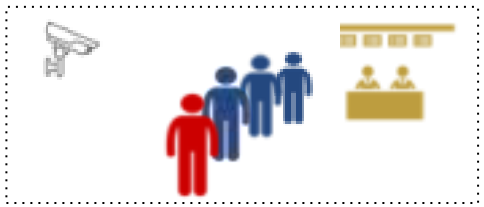
https://www.intellisite.io/solution/human-based-monitoring-hbm/

STADIUM, AIRPORT, CAMPUS APP PACK

1 Mitigate Risk at Entrance

Elevated Body Temp, Mask Detect

2 Better Customer Experience

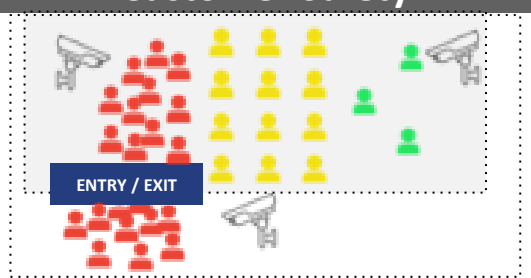


Dwell times, Line Length

3 Maintain Secured Areas

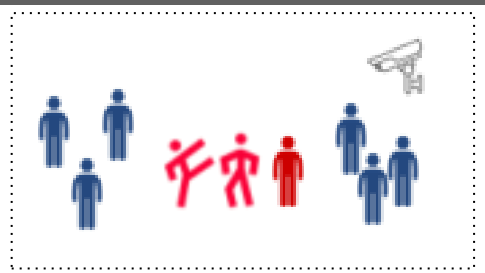
Identity Validation & Monitoring

4 Customer Safety



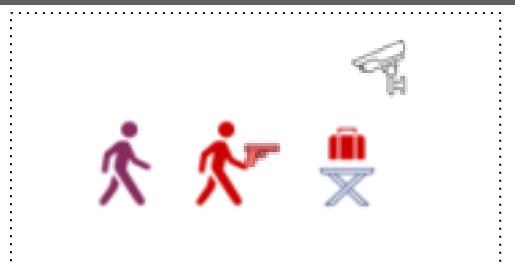
Occupancy, Social Distancing

5 Customer Safety



Risk Behavior, Fights, Crowd Forming

6 Customer Safety



Weapon Detection, Abandoned Object

HOSPITAL APP PACK - CLARA GUARDIAN

Body Temperature Screening

Patient Monitoring

Surgery Analytics

Safe Social Distancing

Fall Prevention

Contactless Controls

RETAIL APP PACK

SAFETY, PPE, CROWDING

CONTACT TRACING

ASSET PROTECTION

STORE ANALYTICS

AUTONOMOUS SHOPPING

STOCK OUT & PLACEMENT

Q & A