

embedded **VISION** SUMMIT 2018

Using Vision to Transform Retail



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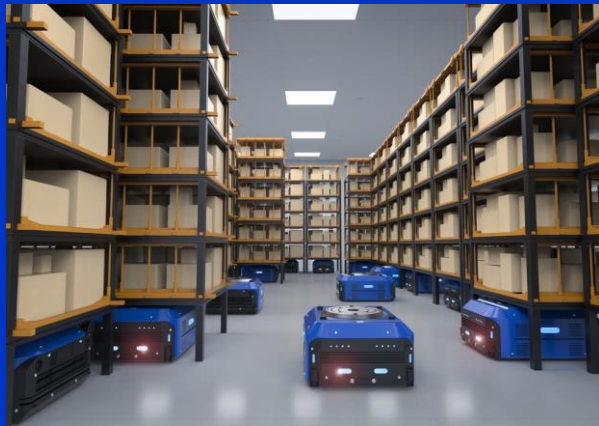
Personalized Service



Theft Detection & Traffic Flow



Automated Delivery



Warehouse Automation



Vision-Based Checkout



Inventory Check

Retail Video Analytics Opportunities: IBM Survey 2013

Safety

Compliance

- Narrow Aisles
- Unstable Stacks
- Refrigerated Deliveries
- Fire Lanes

Events

- Spill Detection
- Fall Detection
- Crash Alerts

Shrink

Checkout

- Pass around
- Sweet-hearting
- Empty cart
- Bottom of basket
- Ticket switching

Floor

- Shoplifting
- Unattended register
- Produce spoilage

Backroom

- Loading dock theft
- Incoming inspection

Sales

Advertising

- Cart localization
- Kiosk activation
- Display verification

Attention

- Dwell time
- Hot zones

Population

- People counting, Loyalty
- Demographics

Flow

- Customer paths
- Aisle usage

Marketing

- Basket / group size

Operations

Checkout

- Missed Rings
- Inventory Accuracy
- Line counting

Floor

- Shelf replenishment
- Vendor service regularity
- Associate finding

Outside

- Parking spots
- Cart supply

Three Case Studies

Predicting In-Store Traffic & Scheduling Sales Reps



Fashion Style Recommendation Engine



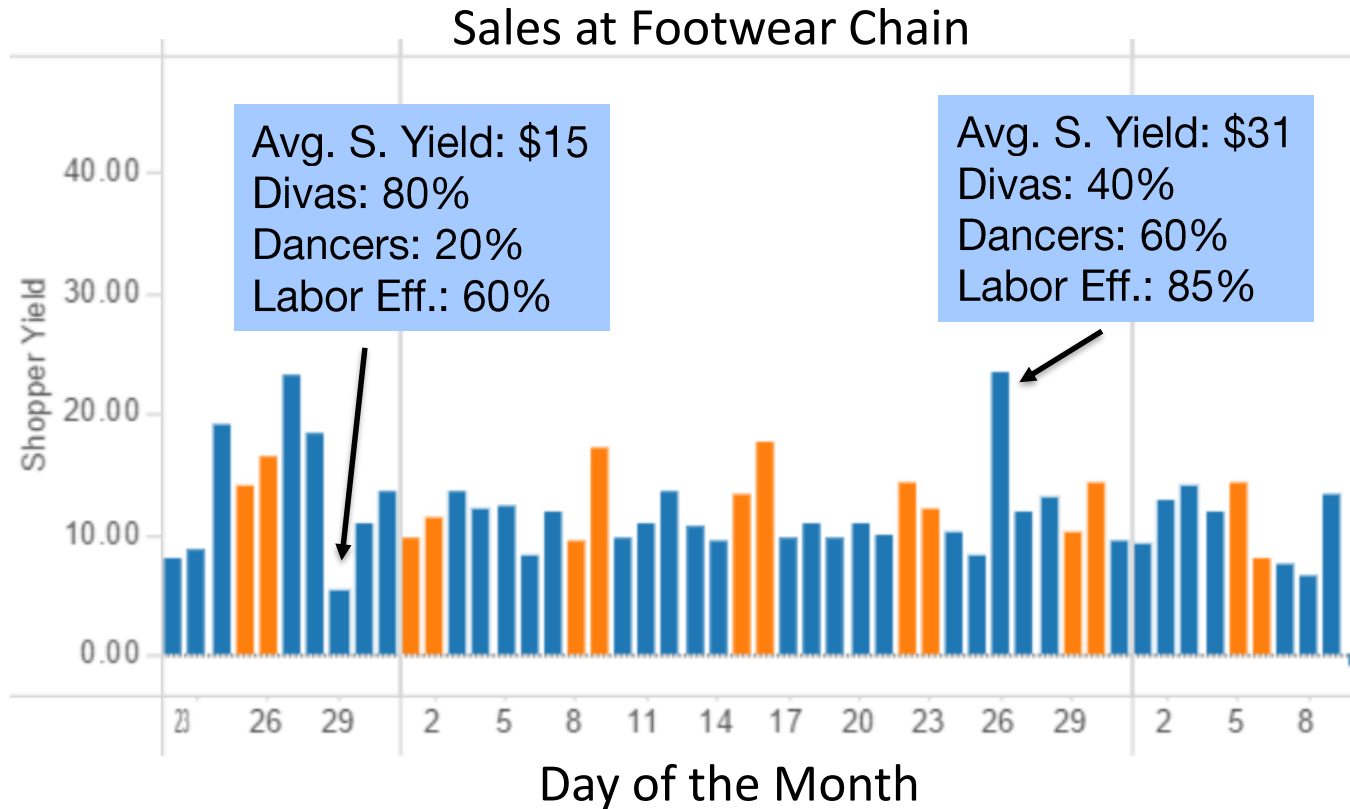
Detecting Theft at Checkout Lanes



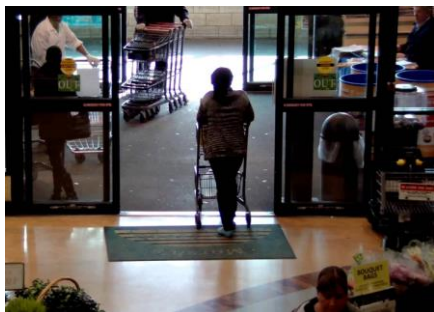
Using Cameras to Predict Store Traffic



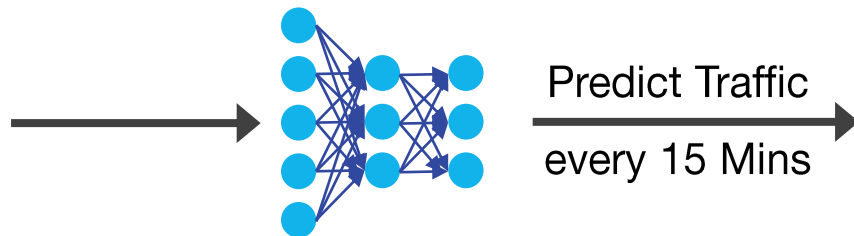
Shoppers Purchase More When the Right Sales People Attend to Them



Percolata: Predict In-Store Traffic Using Cameras



Historical Store
Traffic Captured by
Video Cameras

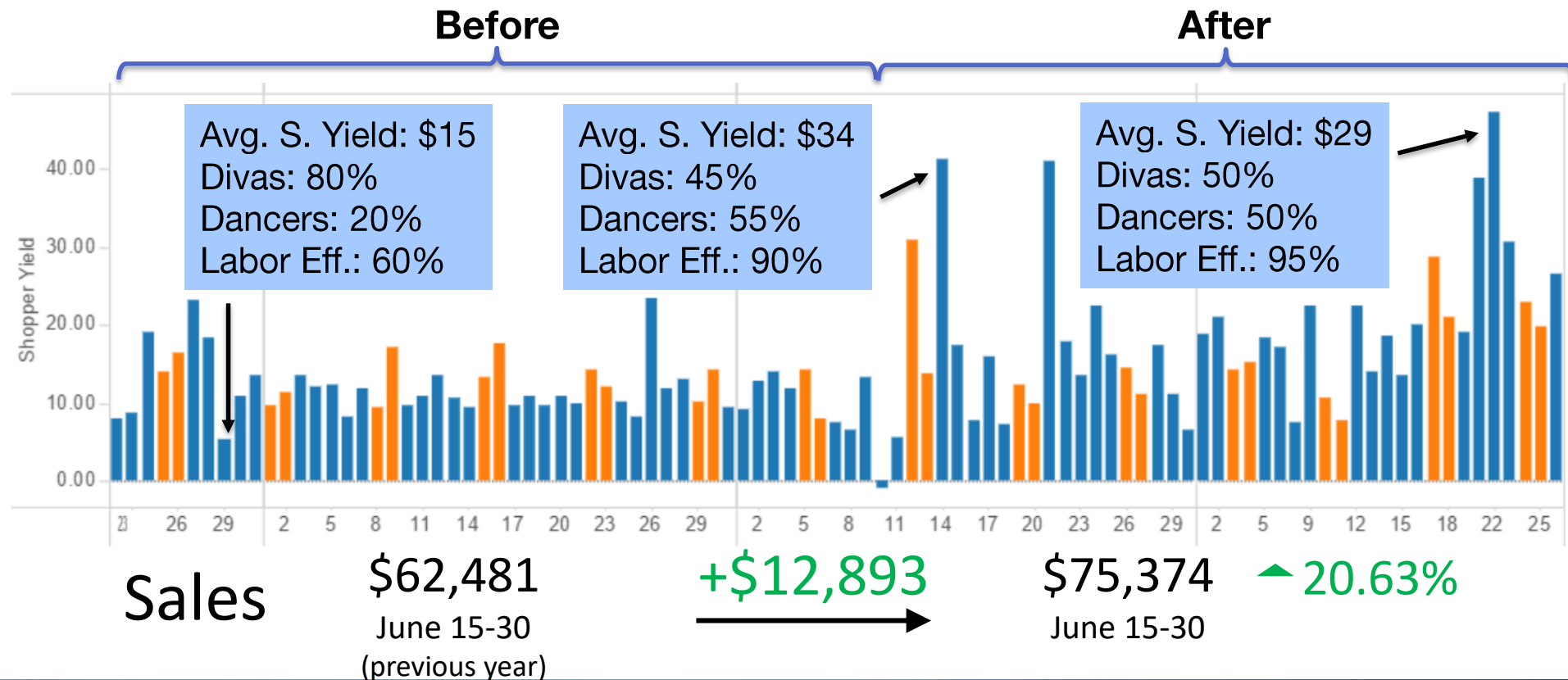


Train Traffic Forecast
AI Model



Schedule Workforce
to Match Traffic

Same Store Revenue Goes Up by 20%



Recommendation Engine for Fashion Suggestions

Streamoid 

E-COMMERCE IMAGE

Products Found: **Original** Dress Footwear



PRODUCT DETAILS ⓘ

Gender	: Female
Category	: Dresses
Collar Depth	: Narrow
Fit	: Slim
Hemline Length	: Above Knee
Hemline Level	: Even
Hemline Shape	: Round
Hemline Width	: Narrow
Neck Depth	: Regular
Neck Type	: Boat
Neck Width	: Close
Occasion	: Semi Formal
Print Size	: Small
Print Type	: Snake
Shoulder Type	: Extended
Silhouette	: Sheath
Sleeve Length	: Cap
Sleeve Type	: Flutter
Type	: Bandage
Waist Level	: Raised
Waist Rise	: High
Waist Type	: Bandless

Vision based training by
Fashion Experts can now
describe products with
>95% Accuracy

Enables

Description-based Search

Better Recommendations

Link Inventory Management to
Social Media Trends

Personalized styling at scale

Fashion aware system that can recognize style and provide aesthetically good, visually appealing and trendy recommendations



STYLE RATING

90%

STYLIST

We think the **fit** and **sleeve** on your top goes well with **colour** and **fit** on your bottom.



STYLE RATING

59%

COMMENTS

We think you can do better by pairing **skirts** with your top.



STYLE RATING

20%

COMMENTS


Formal shirt top just doesn't go well with **jogging jeans**. Why not try **formal trousers** instead?





CASUAL OUTFITS

FORMAL OUTFITS


PARTY OUTFITS


Outfit for BRANDNAME: V Neck Tank Top



OUTFIT PRICE
Rs. 5000




Select a size: XS S M L XL



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000

Select a size: XS S M L XL



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000

Select a size: 32 34 36 39 40



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000



BRAND
Description
Rs. 1000

Select a size: XS S M L XL


BRAND
Description
Rs. 1000

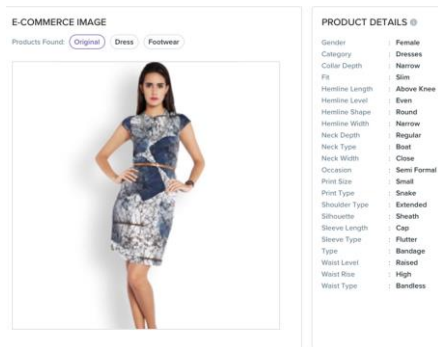

BRAND
Description
Rs. 1000


BRAND
Description
Rs. 1000

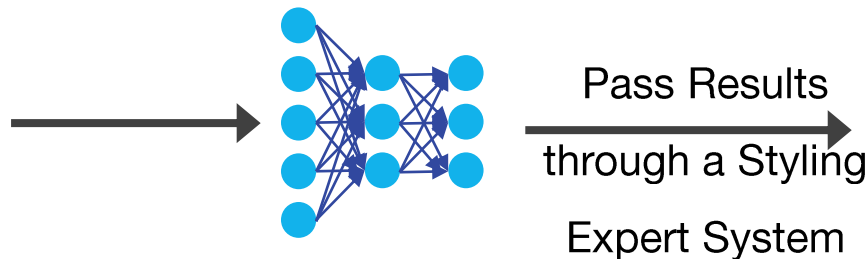

BRAND
Description
Rs. 1000

CHOOSE OUTFIT FOR ME

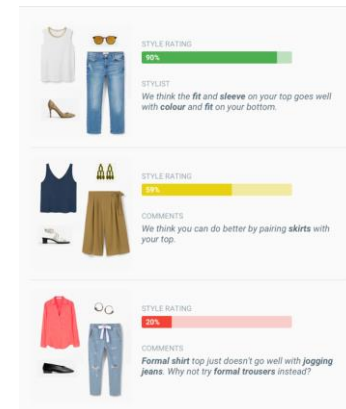
Streamoid: Fashion Recommender



Catalog of Clothes,
Accessories with
Detailed Style Info



Train Fashion
Recommender
AI Model
(~70 Classifiers)



Suggest
Complementary
Clothes & Accessories



Search



- Just In!
- Women ▾
- Men ▾
- Kids ▾
- Home Linen ▾
- Decor & Gifts ▾
- Collections ▾
- Sale! ▾

Cotton Cambric Printed Salwar
\$ 36.49



Cotton Spandex Plain Churidar
\$ 24.33

Cotton Spandex Plain Churidar
\$ 24.33



QUICK VIEW

Share Image

Silk Tussar Spun Churidar
\$ 73.35

-
-
-
-
-
-
-

Cotton Spandex Plain Churidar
\$ 24.33



Cotton Plain Regular Churidar
\$ 19.53



Benefits of Visual Styling & Search Engine

Add to Cart Improvement

100% increase

For a large US retailer; improved relevancy of text search

Higher Conversion

8x the average site conversion

For an Indian e-commerce retailer that deployed a style-bot on Facebook messenger

Higher ROI

20x ROI on AI solutions

For multiple retailers who've deployed the "similar product" recommendation system

Detecting Theft at Checkout Lanes



\$14 billion lost annually by Sweethearting: Theft by employees at cash register, by giving away merchandise to a "sweetheart" customer (friend, family, fellow employee)



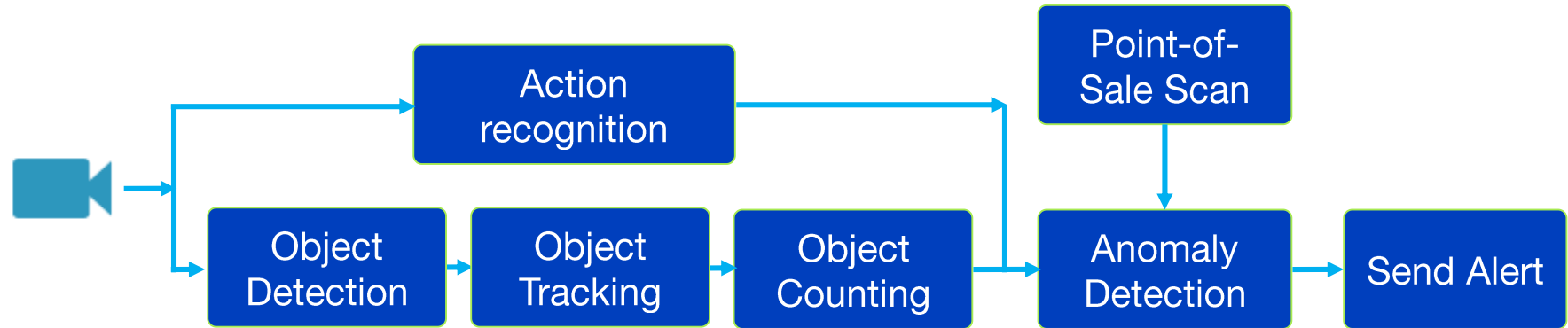
Pick up



Scan

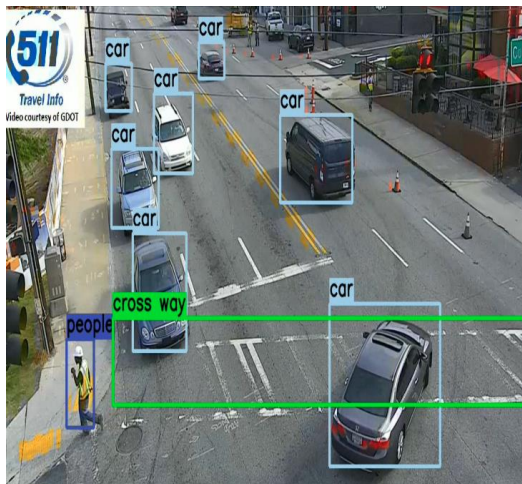


Put Down

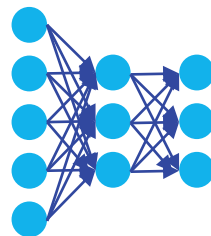


Training Classifiers & Deploying At the Edge

Label Image or
Video Data



Train AI Model
& Build Action System



+

Action
Recognition

Package & Deploy
AI Model at the Edge



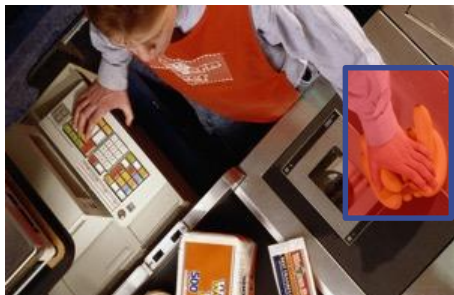
Scan Avoidance Detected: 0

```
RECORD_STATUS = Enum(
current_record_status = RECORD_STATUS.IDLE.value
record_seconds = 0)
```

```
def BroadcastOutput(object):
    def __init__(self, video_cap, source_type):
        global video_width, video_height, video_fps
        print("Initiating background conversion process")
        ret, frame = video_cap.read()
        height, width, ch = frame.shape
        video_width = width
        video_height = height
        dimension = (width, height)
        print("dimension", dimension)
        self.sleep_time = 0
        if source_type == "File":
            *fps = int(video_cap.get(cv2.CAP_PROP_FPS))
            if not fps:
                fps = 25.0
```

Several Use Cases of Zone-based Action Detection

Scan Avoidance Checking



Scan avoidance in cashier line. Video action detection will detect and identify the incidence and record.

Trolley Monitoring and Item Tracking



Detect NOT empty trolley or basket when going through cashier line

Hot-area & Cashier Lane Monitoring



Customers getting through cashier line without paying or when the cash counter is closed

Vision is set to revolutionize online and in-store retail

Opportunity to Leverage Surveillance Camera
Infrastructure

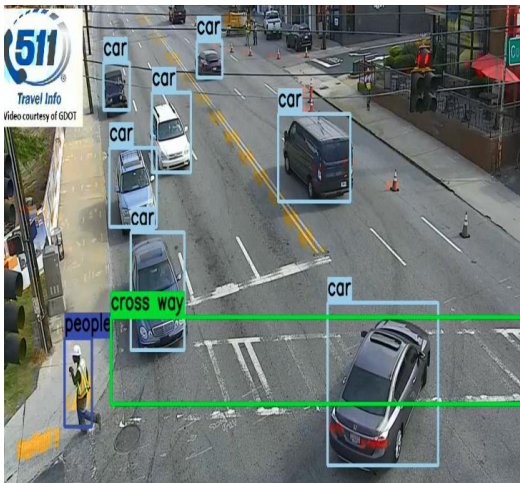
Loss Prevention is High Priority

Customer Insights, Upsell, & Cross-Sell are Key
Growth Opportunities

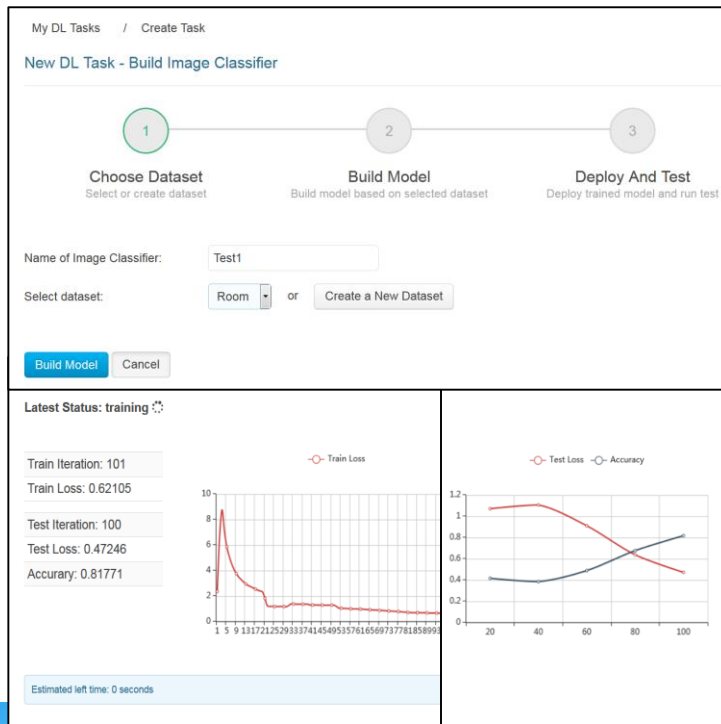
IBM PowerAI Vision: "Point-and-Click" AI for Images & Video

www.ibm.biz/poweraideveloper

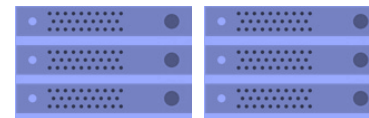
Label Image or Video Data



Auto-Train AI Model



Package & Deploy AI Model



IBM PowerAI