IBM Visual Inspector™: AI and Computer Vision on iOS™

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Quality Inspection

Up to 20% of the Cost of Production*

“Error Proofing”

*Source: Markets & Markets, “AI in Computer Vision,” April, 2018
Observations

• High cost of rework – $100K to $400K monthly expense example*

• High cost of expected materials waste - $20K to $30K monthly expense**

• Reacting to change measured in months

• Inconsistent quality reaching customers – Warranty work, recalls, future revenue impact

• Impact on revenue from lost opportunity

* Source: Global Automaker production example
** Source: Global Steel Parts manufacturer
Immediate **Tangible** Results

Remarkably **Easy** to Achieve

> Seeing it to using it within a **few hours**!
Quality Inspection Solution – Component Details

IBM Visual Insights™

1. IBM Visual Insights with *CoreML

2. Training CUSTOM AI Models

+ IBM Visual Inspector™

3. INFERENCE on iOS Devices

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IBM Visual Insights™: “Point-and-Click” AI for Images & Video

Label Image or Video Data

Auto-Train AI Model

Package & Deploy AI Model

Training / Color of Cars_model

Browsing away from this page will not stop the training.
To cancel or stop the training early, click the "Stop training" button.

Object detection
Accuracy tensor R-CNN

22 MINUTES LEFT

Initialized
Sat, 2019-12-03 12:00:00 PM

Stop training

Model hyperparameters

Learning rate
Max iteration
Weight decay
Momentum
Ratio

0.001
4000
0.0005
0.9
0.8

Loss VS Iteration

Train Loss CLS
Train Loss Block

0

-2
-1
0
1
2
3
4
5
6
7
8
9
10

Iteration

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Automotive Manufacturing Use Case: IBM Visual Insights™ + IBM Visual Inspector™

Client

American Multinational Automaker

Challenges

- Minimize defective cars coming out of manufacturing line
- Ability to detect a defect at the point of part installation so that it can be resolved quickly
- Cycle time to train and deploy AI inspection models
Automotive Manufacturing Use Case: Visual Insights™ + IBM Visual Inspector™

Transformation

We created **IBM Visual Inspector™**, a native iOS/iPadOS app that delivers custom computer vision inferencing capabilities from **IBM Visual Insights™** to the edge using Apple’s **Core ML™**.

IBM Visual Inspector:

- Leverages object detection and image classification models for remote inferencing
- Monitors inspection performance down to each device through an integrated reporting dashboard
- Provides a supervisor capability for remote management and configuration of devices
- Determines if a quality issue exists to take action in real time
Automotive Manufacturing Use Case: Visual Insights™ + IBM Visual Inspector™

1. Capture images of good and bad
2. Upload the images to Visual Insights
3. Train/re-train models
4. Download models to Visual Inspector app
5. Models run on iOS device using Core ML
6. Communicate direct to PLCs, MES, and dashboards
7. Built-in dashboard to see inspection results
8. Send additional alerts through MQTT and Twilio

Visual Insights™ + IBM Visual Inspector™

- Weld Inspection
- Sealant Inspection
- Detect Paint Defects
- Right Part on Car
- Correct Installation
Automotive Manufacturing Use Case: Visual Insights™ + IBM Visual Inspector™

Impact

• Initial implementation identified 32 defects in 30 days that would have not been discovered until final inspection, avoiding significant re-work cost
• Manufacturing staff can train and deploy the new models within hours, without needing a data scientist
• Models can be re-trained and re-deployed, as needed, using off-the-shelf iOS devices
• The automaker scaling to 25 quality inspection points at one location, and replicating the solution across their assembly plants
Experience the **Value**

1. Increased accuracy & consistency
2. Reduced manual visual inspection
3. Speed of implementation
Getting Started

Offering details
- Introduction to IBM Visual Insights
- Introduction to IBM Visual Inspector
  - Developer Works

Access to trial Software
- Download evaluation licenses for 90 days
- Try Visual Insights on the research cloud for 30 days
- Download IBM Visual Inspector from App Store

Product Demos
- IBM Visual Insights & Inspector

Product documentation
- Knowledge Center for IBM Visual Insights
- Knowledge Center for IBM Visual Inspector

IBM Visual Insights

IBM Visual Inspector
Thank you

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