# Mastering Real-Time Intelligence

**Edge Decisioning** 

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#### Purpose:

Share how edge decisioning simplifies and speeds up decision-making to deliver real time benefits

### Agenda

- Why edge ML
- Considerations when designing an edge decisioning solution
- Example use cases

### Outcome

Determine fit and define upcoming actions and next steps

## Current State of ML

Focus is on creation, not deployment (and usually then into the Cloud)

Current Edge solutions are difficult to create and have high latencies



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## Why do you need Edge ML?





Data harmonization

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OnPi





Cross-Operation/Process

Low Latency Edge Compute

Feedback Mechanism

## ML Architectures and Latencies

Туре	Typ Latency	Use Case
Cloud	10 min	Offline and Batch analytics
Central On-prem	<1 min	Soft real time (discrete MFG) and Batch/image analytics
Edge/Distributed	<1 sec	Hard real time. Continuous mfg and low takt time

## Considerations When Designing Edge Decisioning Solution

Туре	Typ Latency	Use Case	and
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Edge/Distributed	<1 sec	Hard real time. Continuous mfg and low takt time	

Complete ML Lifecycle Management with external tool integration

## NI's Answer: Decisioning at the Edge<sup>SM</sup>

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## IN Example Use Cases and Expected Benefits/ROI



#### Challenge:

- Inconsistent manual inspection results
- Inconsistent training for manual inspection
- Extremely difficult to modify and deploy algorithms

#### Results:

- >80% reduction in manual inspection
- 40% improvement in scrap reduction YOY
- **100%** human control (HITL); deploy new models in "shadow mode"



#### **Challenge:**

- Difficult to make real time determinations if parts are good or not
- Difficult to update edge software and/or algorithms

#### **Results:**

- Sub 100ms decisioning
- >98% accuracy
- Vastly simplified creation, deployment & management of algorithms to the edge devices





#### Challenge:

- Difficult to create, deploy and manage edge ML algorithms
- No able to stop long running tests early if likely to fail in order to increase throughput

#### <u>Results:</u>

- Increased test throughput
- Reduced capital expenditures
- Optimize test sequences (VST use case #)

## Example Distributed Edge Solution Architecture



## ■ Example Centralized Edge Architecture (Vision)



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## Simple ML Lifecycle Management

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## Democratizing Analytics and ML



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Seamless Edge ML Lifecycle Management

Flexible Platform for any data or architecture



Work smarter not harder

Come see the Demo at the Product Analytics booth in the Main Hall

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### For more information, contact:

#### Your Account Manager

#### **Technical questions:**

Peter Hodgins FAE Manager, Product Analytics peter.hodgins@ni.com

### General offering questions:

Penny Merian Director Offering Management, Product Analytics penny.merian@ni.com

### Stop by the demo floor



![](_page_13_Figure_0.jpeg)

## Give us your feedback! Quick 2 Question Survey

In the mobile app, click into the session you would like to provide feedback for

![](_page_14_Picture_2.jpeg)

10:15 AM Multichannel RF Data Recording 11:15 AM and Analysis

- Meeting Room 19A
- Aerospace & Defense Technical Session

10:15 AM Optimizing Validation Processes: 11:15 AM Building Complex Test Systems with Distributed I/O

- Meeting Room 19B
- Aerospace & Defense Technical Session

10:15 AM Panel: Continuous Integration (CI/ 11:15 AM CD)—Don't Leave Home without It

- Meeting Room 12A
- Programming Essentials Technical Session

10:15 AM Using Python and TestStand to 11:15 AM Boost Your Test Development

- Ballroom G
- Product & Technology Technical Session

#### 10:15 AM What Does Left Shifting Test 11:15 AM Mean in the NI Ecosystem?

Meeting Room 18A
 Transportation - Technical Session

#### 🕻 Tue May 23

### r Add to Schedule 📋 iCal 🔍 Check in Optimizing Validation Processes: Building

Complex Test Systems with Distributed I/O Tue May 23 10:15 AM - 11:15 AM

#### []]a Surveys

#### **Take Session Survey**

In this session, learn to improve efficiency and reduce non-recurring engineering costs in validation labs by connecting multiple distributed line-replaceable unit (LRU) test systems. Also learn how to abstract LRUs and construct complex test systems faster and more efficiently using existing distributed I/O and edge computation technology.

## Click "Take the Session Survey"

![](_page_14_Picture_28.jpeg)