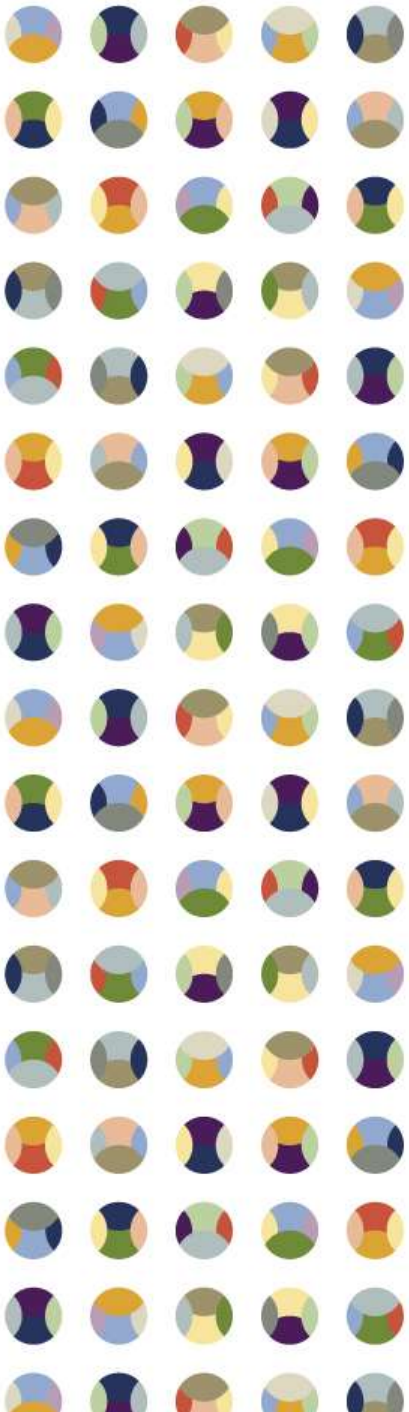


NIDays

WORLDWIDE GRAPHICAL SYSTEM DESIGN

CONFERENCE

NATIONAL INSTRUMENTS™

Do More Innovation with Graphical System Design

Test Product Director

Luke Schreier

Everyone is talking about the world economy!

BUSINESS
Layoffs cut deep
Economy fa
into recess
Dow falls anot
Abundant pini

Engineering Grand Challenges

Cancer Detection

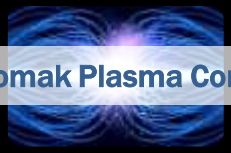
Advance health informatics

Hadron Collider

Engineer the tools of scientific discovery

Infant Brain Scans

Reverse-engineer the brain



Tokomak Plasma Control

Provide energy from fusion

IV Drift Pump

Engineer better medicines

Advanced Purification

Provide access to clean water

Xbox Testing

Enhance virtual reality

Olympic Stadium Safety

Restore and improve urban infrastructure

CO_2 Storage

Develop carbon sequestration methods

Distance Learning

Advance personalized learning

Cheap Solar Panels

Make solar energy economical

Material Monitoring

Prevent nuclear terror

Spectral Monitoring

Secure cyberspace

Costa Rica Rain Forest

Manage the nitrogen cycle

Source: National Academy of Engineering

“Engineering is Tomorrow’s Future
along with the solution
for Today’s Problems”

[EDN]

A Partnership in Innovation

Your Domain Knowledge
and
Graphical System Design
Tools of Innovation

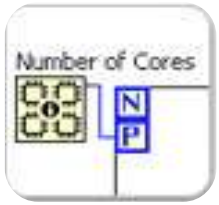
DESIGN → PROTOTYPE → DEPLOY

Do More

[with NI LabVIEW]

NATIONAL INSTRUMENTS

LabVIEW™ 2009



Multicore Processors

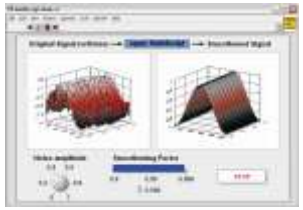
Personal Supercomputing

FPGA Technology

Rapid Embedded Design and Prototyping

Wireless Systems

Intelligent Distributed Systems



Real-Time Math

Deterministic Algorithm Deployment

NATIONAL INSTRUMENTS

Fixed-Point Casting Functions

Data Value References

New Dynamic Data Express VI

Command-Line Differencing

Using Xpath to Query XML Documents

Group Digital Signals Express VI

TDMS and NI-DAQmx Logging Integration

RSS-Driven Getting Started Window

VI Snippets

Guaranteed Downcasting of Classes

New System Directory VIs

Enhanced Curve-Fitting Functionality

LabVIEW DataFinder Toolkit

New VI Analyzer Tests

Sound VIs on Mac

Native Recursion

New Signal Processing VIs

Enhanced Icon Editor

SSL Security for Web Services

CPU Information Palette

VI Hierarchy Window Enhancements

Quick Drop Improvements

Bus/Line Configuration in Digital Waveform Graph

Partial Differential Equation Palette

Generate .NET Interop Assemblies

Domain Account Manager Enhancements

Probe Watch Window

New In-Place Element Structure I/O Nodes

New Matrix Functions

Feedback Node Configuration Options

LabVIEW MathScript RT Module

Parallel For Loops

New 2D and 3D Plots

TDMS File Format Improvements

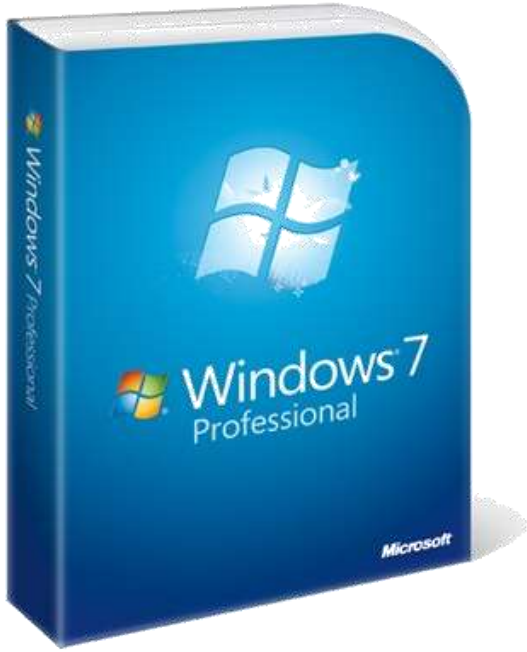
Search Algorithm Enhancements

Enhanced Block Diagram Cleanup

NATIONAL INSTRUMENTS

Supporting the Next OS: Windows 7

- Tested LabVIEW 2009/driver support
- Increased USB DAQ throughput
- Improved multicore/multitasking
- Enhanced performance with 64-bit



NATIONAL INSTRUMENTS

Graphical Scripting for LabVIEW

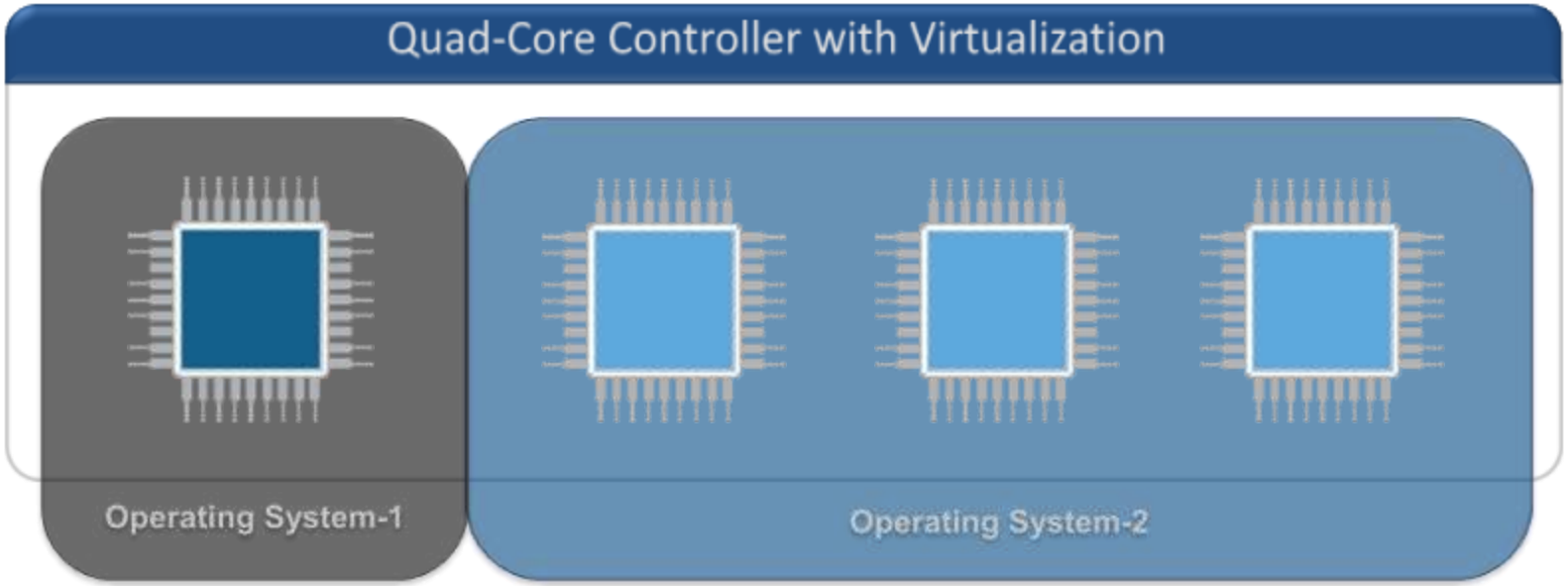
Erik Van Hilten and
Bas Van Dijke

Do More

[Multicore]

Applications
Graphics
Services
Windows XP
LabVIEW Real-Time
Determinism
Real-Time I/O
Timing

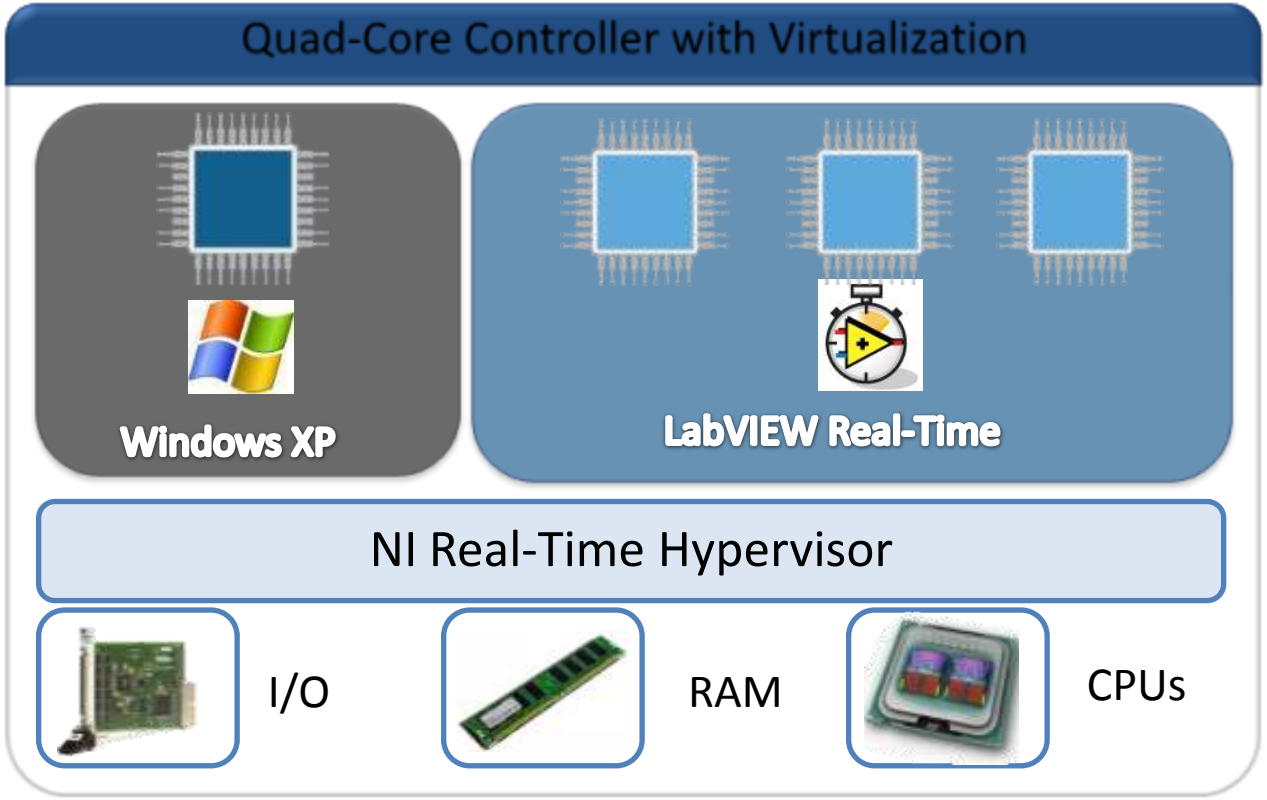
Evolution of Multicore



NATIONAL INSTRUMENTS

NI Real-Time Hypervisor

Run LabVIEW RealTime and Windows XP simultaneously



Available on multicore PXI and industrial controllers

NATIONAL INSTRUMENTS

Do More

[Data Acquisition]

20 Years | NI Data Acquisition

NuBus

1988

1989

PCI

1995

1996

ISA

E Series

PXI

1998

R Series

2003

M Series

USB

PCI Express

2004

2005

NI Wi-Fi DAQ

Ethernet DAQ

2006

2008

PXI Express

NI CompactDAQ

NATIONAL INSTRUMENTS

Introducing | NI X Series Multifunction DAQ

- 16 PCI Express and PXI Express devices
- Enhanced **NI-STC3**
  - 4 enhanced counters
  - **100 MHz** timebase
  - Independent analog/digital timing engines
- Higher throughput and lower latency
  - Native x1 **PCI/PXI Express** interface
  - **8 DMA channels** for parallel data stream

NATIONAL INSTRUMENTS

New Features | NI CompactDAQ

- Three AI timing engines
- Built-in BNC triggers
- Four counters
- Locking USB cable
- 9 to 30 VDC power
- Four-slot option

Do More

[Wireless Measurements]

Wireless Application Areas

Environmental Monitoring

Air/ Climate | Water/ Soil | Indoor Monitoring

Resource Monitoring

Power Monitoring | Solar Monitoring | Wind Farm Monitoring

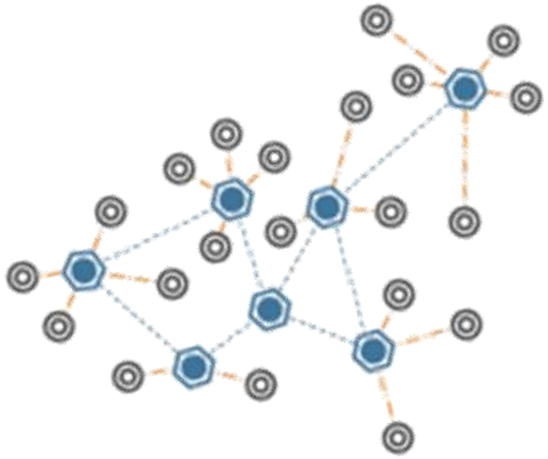
Industrial Measurements

Structural Health Monitoring | Machine Condition Monitoring | Process Monitoring

NATIONAL INSTRUMENTS

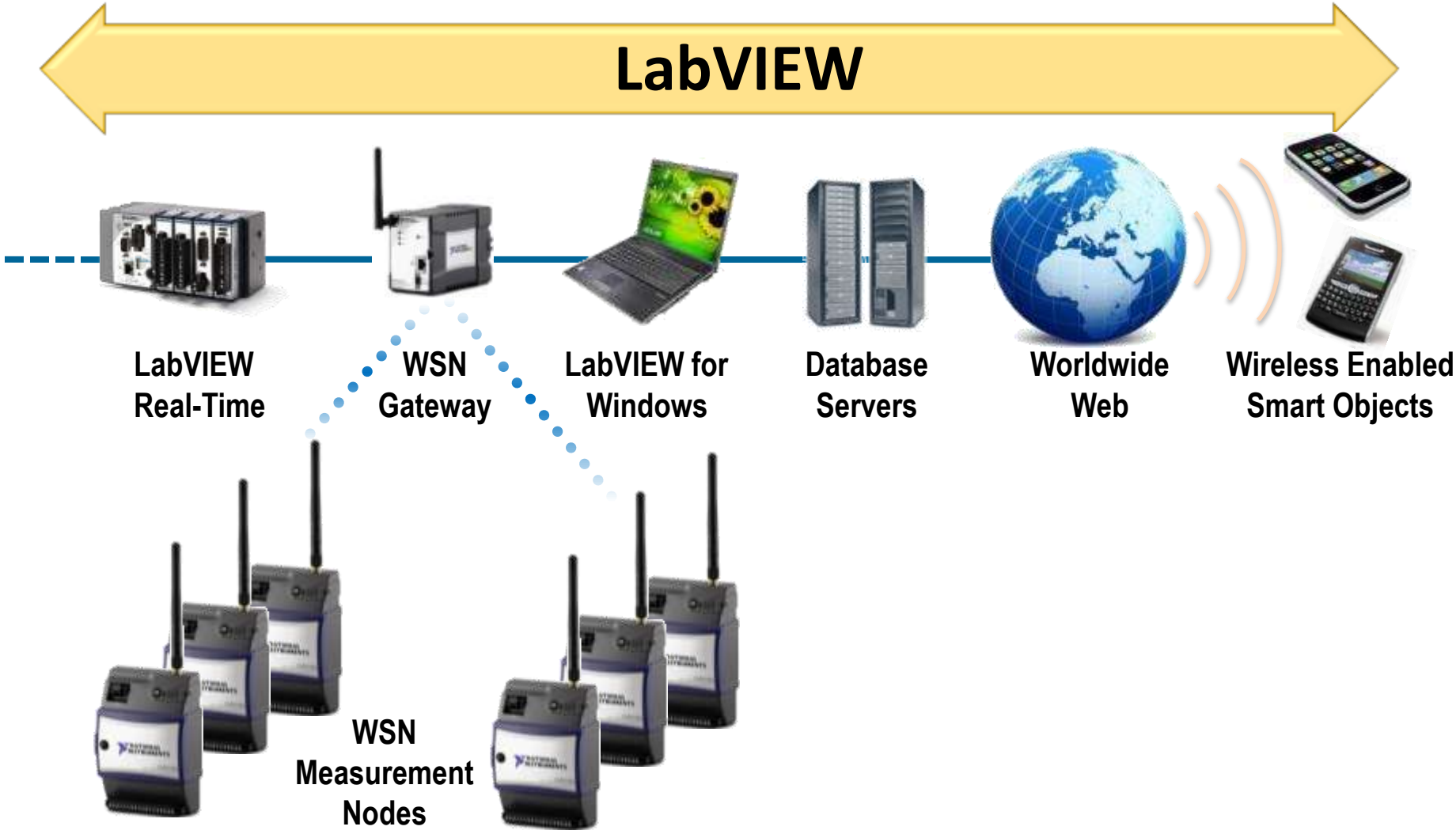
NI Wireless Sensor Networks

Low Power. Reliable.



- 16-bit voltage input node
- 24-bit thermocouple node
- Up to 3-year battery life
- 2.4 GHz, IEEE 802.15.4 radio
- Programmable nodes

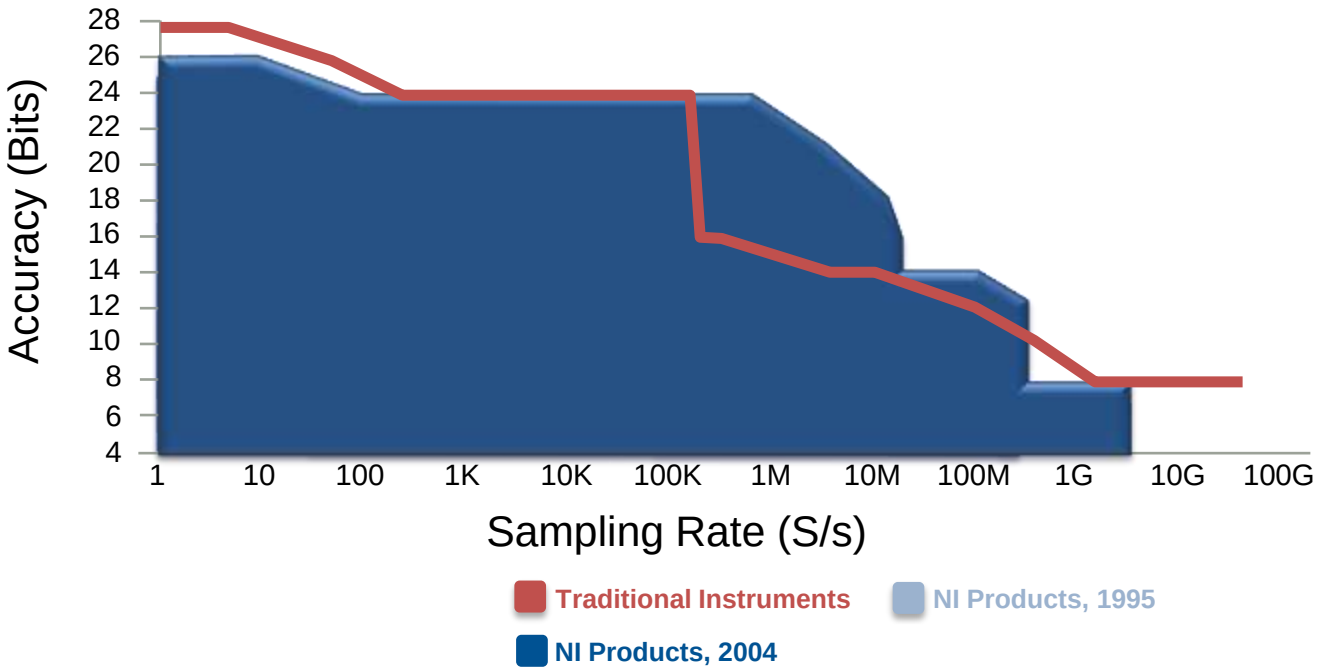
WSN System Architecture



Do More

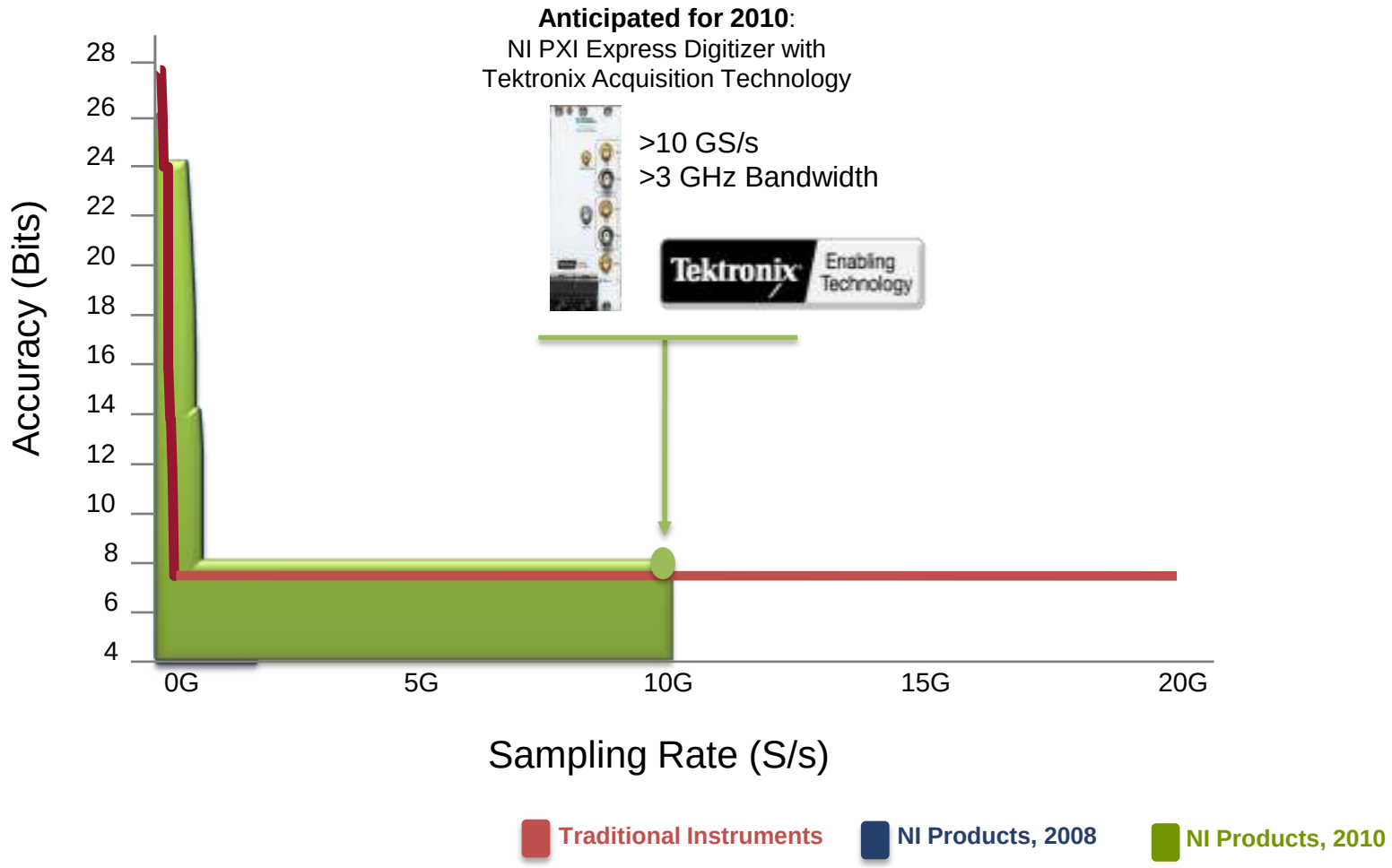
[Automated test]

Expanding Measurement Capabilities



NATIONAL INSTRUMENTS

Expanding Measurement Capabilities



NI PXI Semiconductor Suite

Source Measure Unit

High-Speed Signal Insertion Switch

High-Speed Digital I/O

RF 6.6 GHz VSA/VSG

WGL/STIL Importing Software

New Source Measure Unit | Semiconductor Test

Features:

- 10pA measurement sensitivity
- Up to +/-100V and up to +/-100mA
- 4-quadrant operation
- Remote (4-wire) sense, guarding

Recommended applications

- Leakage test on discrete components
- Parametric measurements on semiconductor chips
- IV characterization and other physical measurements

NI PXI -4132

Precision Source Measure Unit

NATIONAL INSTRUMENTS

New Digital Instruments | Semiconductor Test

Features

- 100/200 MHz Maximum Clock Rates
- 32 bidirectional digital lines (SW controlled)
- Selectable Voltages of 1.2, 1.5, 1.8, 2.5, and 3.3V
- x4 PXIe streaming bandwidth (Up to 660MB/s)
- Onboard High Precision clock with sub-Hertz resolution (DC to 200 MHz)

NI PXI -6544/45

200 MHz Digital Waveform Analyzer/Generator

NATIONAL INSTRUMENTS

New Digital Instruments | Semiconductor Test

Differences from 6544/45:

- 200/400 Mbps maximum data rates
- Selectable Voltages of 1.2 - 3.3V (100mV steps) 22 voltage levels
- Per channel, per cycle state control (1, 0, Z, L, H, X)
- Onboard Hardware Compare
- Peer to Peer Streaming
- Serial Triggering

NI PXI -6546/47

400 Mbps Digital Waveform Analyzer/Generator

NATIONAL INSTRUMENTS

Chip Characterization Demo

New VSA VSG List mode | RF and Wireless Test

NI PXIe-5663E

6.6 GHz Vector Signal Analyzer
with RF List Mode

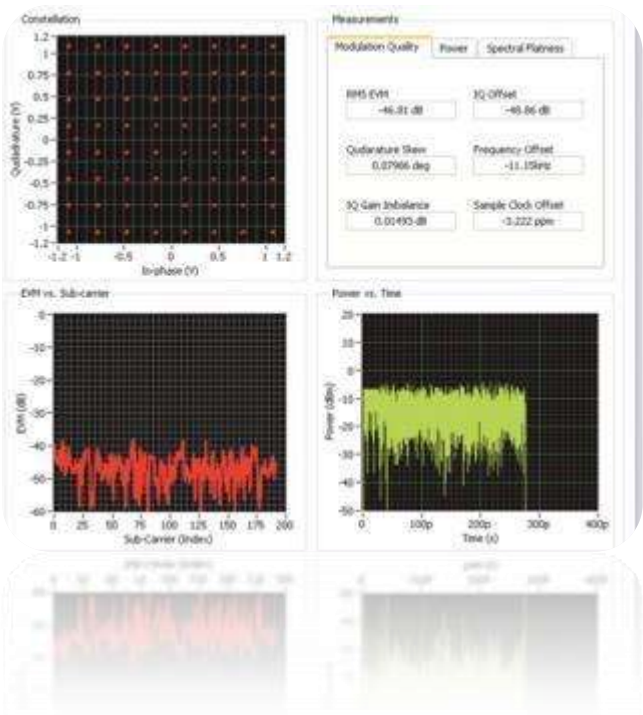
NI PXIe-5673E

6.6 GHz Vector Signal Generator with
RF List Mode

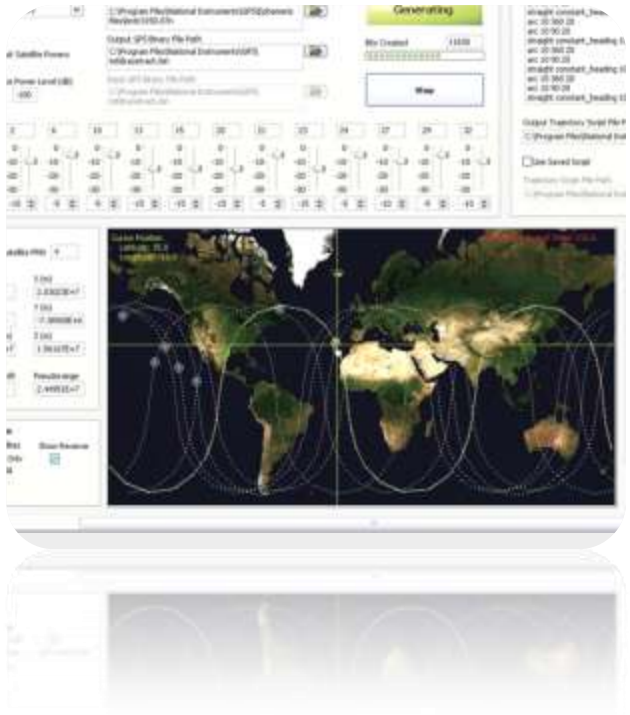
NATIONAL INSTRUMENTS

New RF Toolkits | LabVIEW and LabWindows™/CVI

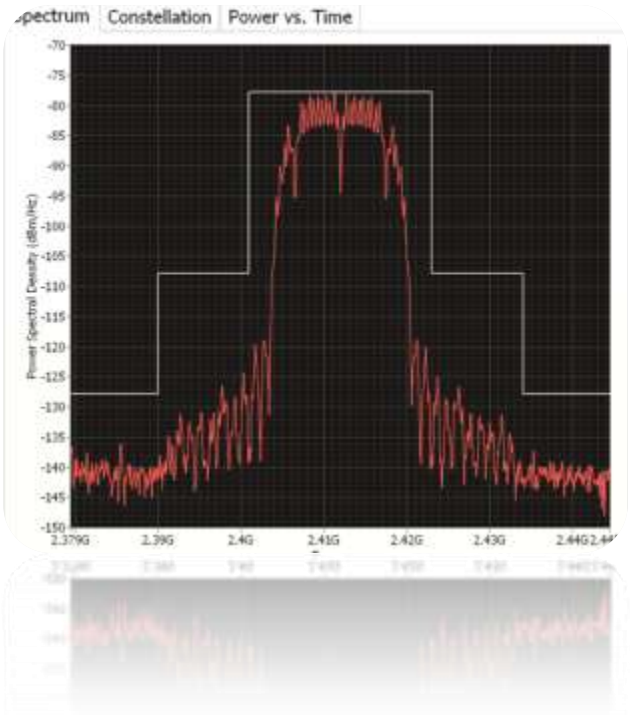
WLAN Toolkit



GPS Simulation Toolkit



WiMAX Toolkit



The mark LabWindows is used under a license from Microsoft Corporation. Other product and company names listed are trademarks or trade names of their respective companies.

NATIONAL INSTRUMENTS

NI FlexRIO | Reconfigurable FPGAs for Test

Announced November 2008

Announced February 2010

NI PXI-795x PCI-based FlexRIO FPGA Modules

- Virtex-5 **LX** Series FPGAs
- **128 MB** onboard DRAM

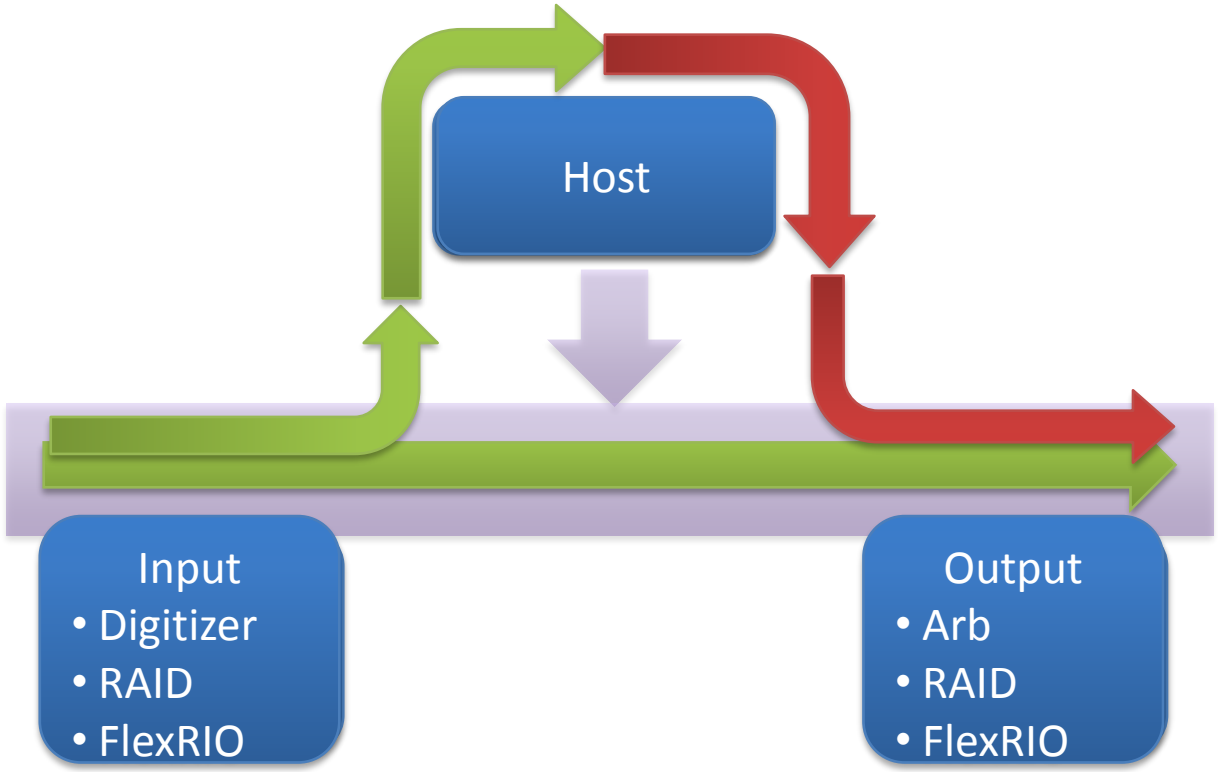
NI PXIe-796x PCI Express-based FlexRIO Modules

- Virtex-5 **SXT** Series FPGAs
- **512 MB** onboard DRAM
- **Co-processing** for other instruments

NATIONAL INSTRUMENTS

Data Streaming | Traditional Model

Peer to Peer Streaming | The NI Model



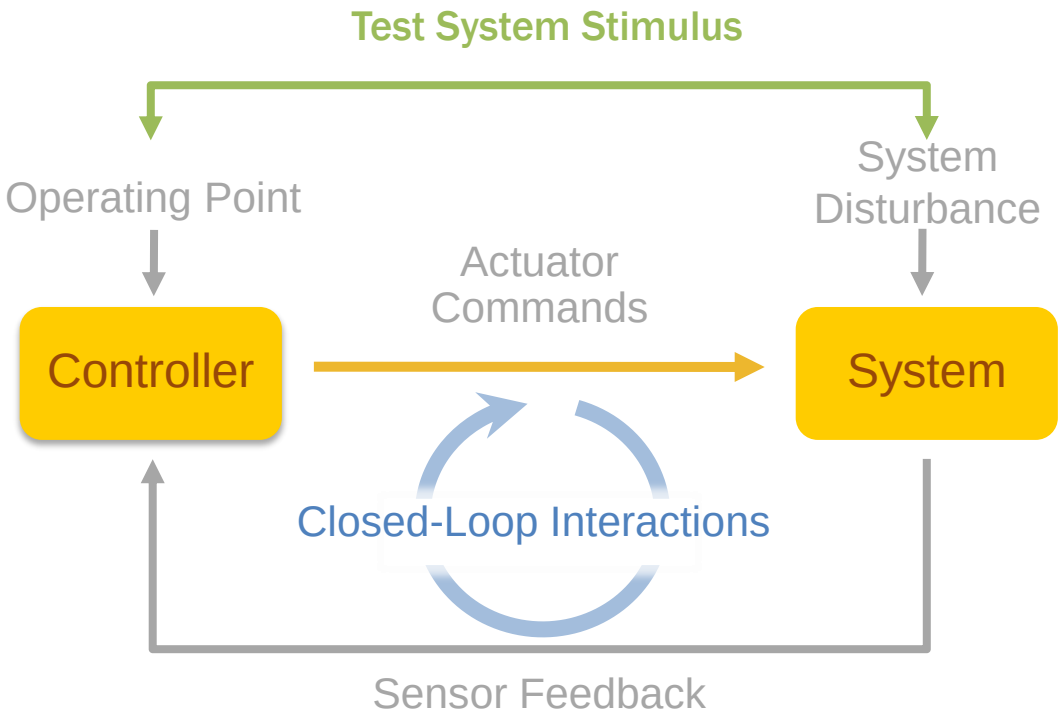
NATIONAL INSTRUMENTS

Peer-to-Peer Streaming demo

Do More

[Real-Time Test]

Real-Time Testing and Simulation

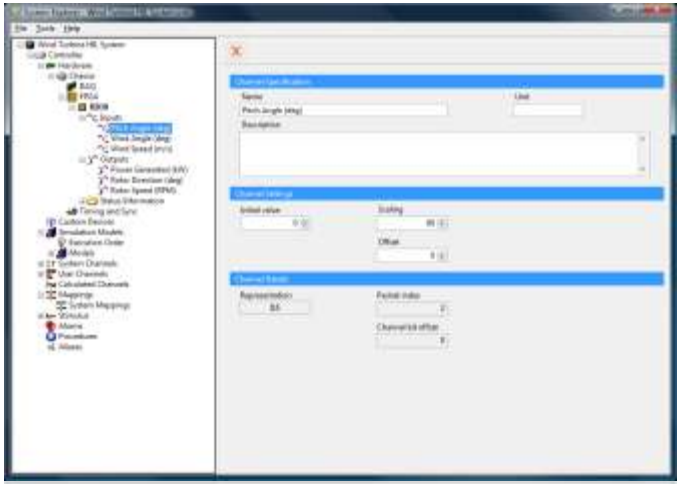


NATIONAL INSTRUMENTS

NI VeriStand

Real-Time Testing and Simulation Software

- Hardware I/O
- Models
- Stimulus Profiles
- Data Logging
- Calculated Channels
- Alarming



Ready to configure and use

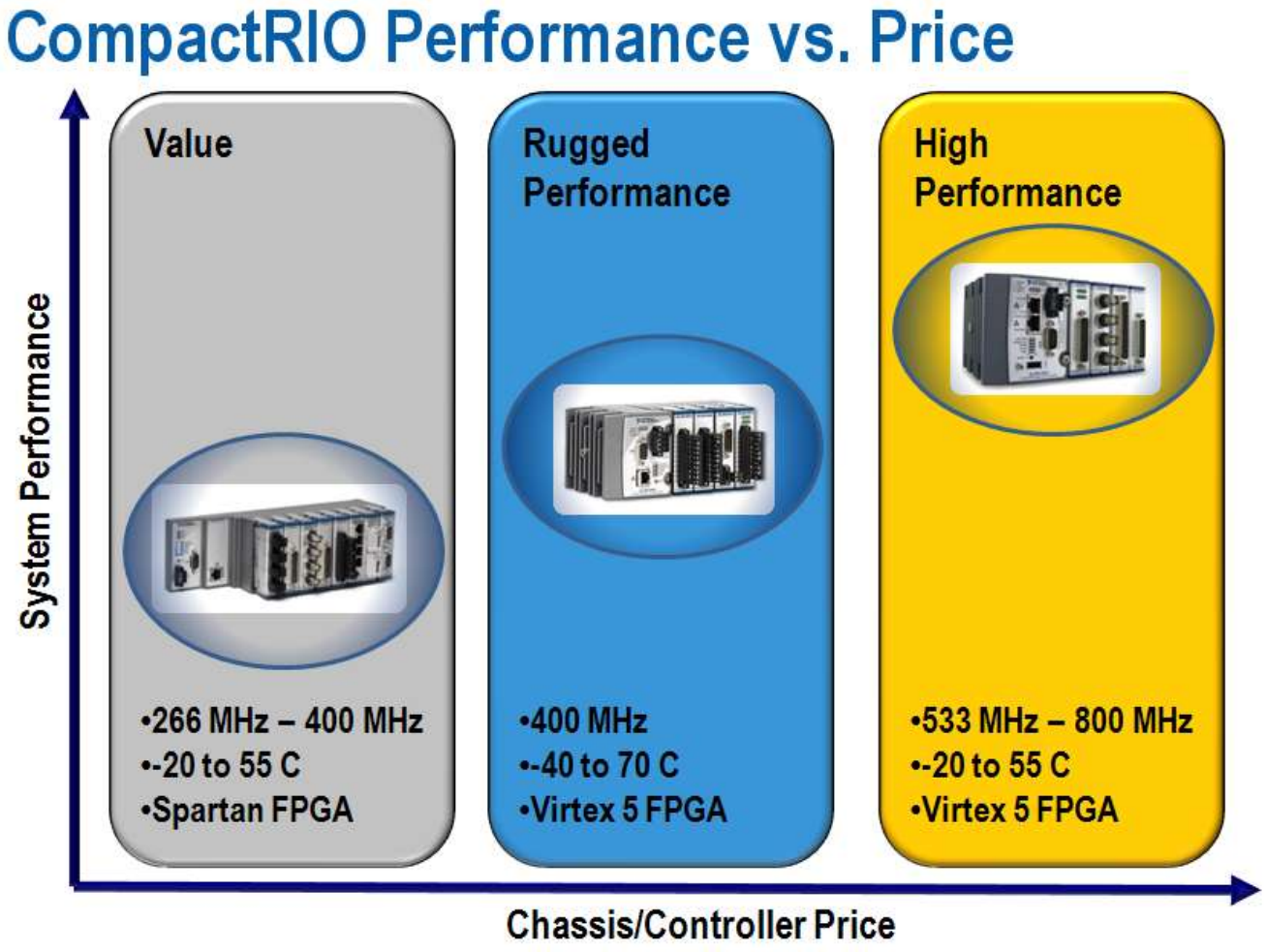
NATIONAL INSTRUMENTS

VeriStand demo

Do More

[Embedded Control]

CompactRIO the right platform for embedded control



NATIONAL INSTRUMENTS

CompactRIO Evolution | Hardware & Software

cRIO 9023 and cRIO 9025

New Rugged Performance RT Controllers

cRIO 911x

Virtex-5 LX family CompactRIO Reconfigurable Chassis

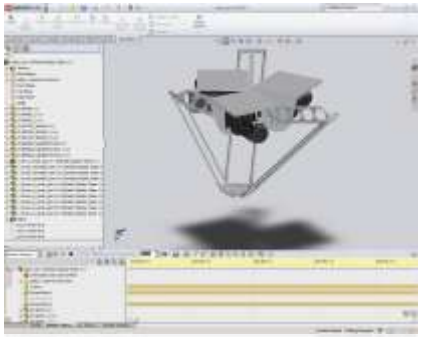
- Real Time Mathscript
- Vision Capabilities
- File I/O througput
- Model execution

- Math IP Fixed point
- Signal Processing and measurements
- Control
- MEMS integration

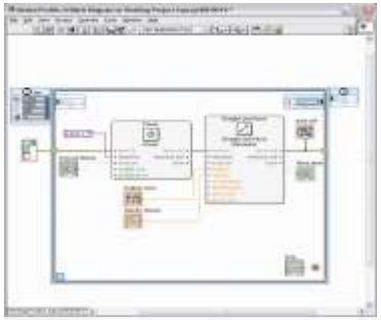
NATIONAL INSTRUMENTS

NATIONAL INSTRUMENTS LabVIEW 2009

CompactRIO Motion Control



New LabVIEW
SolidWorks Interface
Simplified digital prototyping



New LabVIEW
NI SoftMotion Module
Simplified motion

New C Series Drive
Interface Modules
Servo drives | Stepper drives

SolidWorks

NATIONAL INSTRUMENTS

NATIONAL INSTRUMENTS

Virtual Prototyping with LabVIEW and SolidWorks

Do More

[Robotics]

LabVIEW and Robotics World

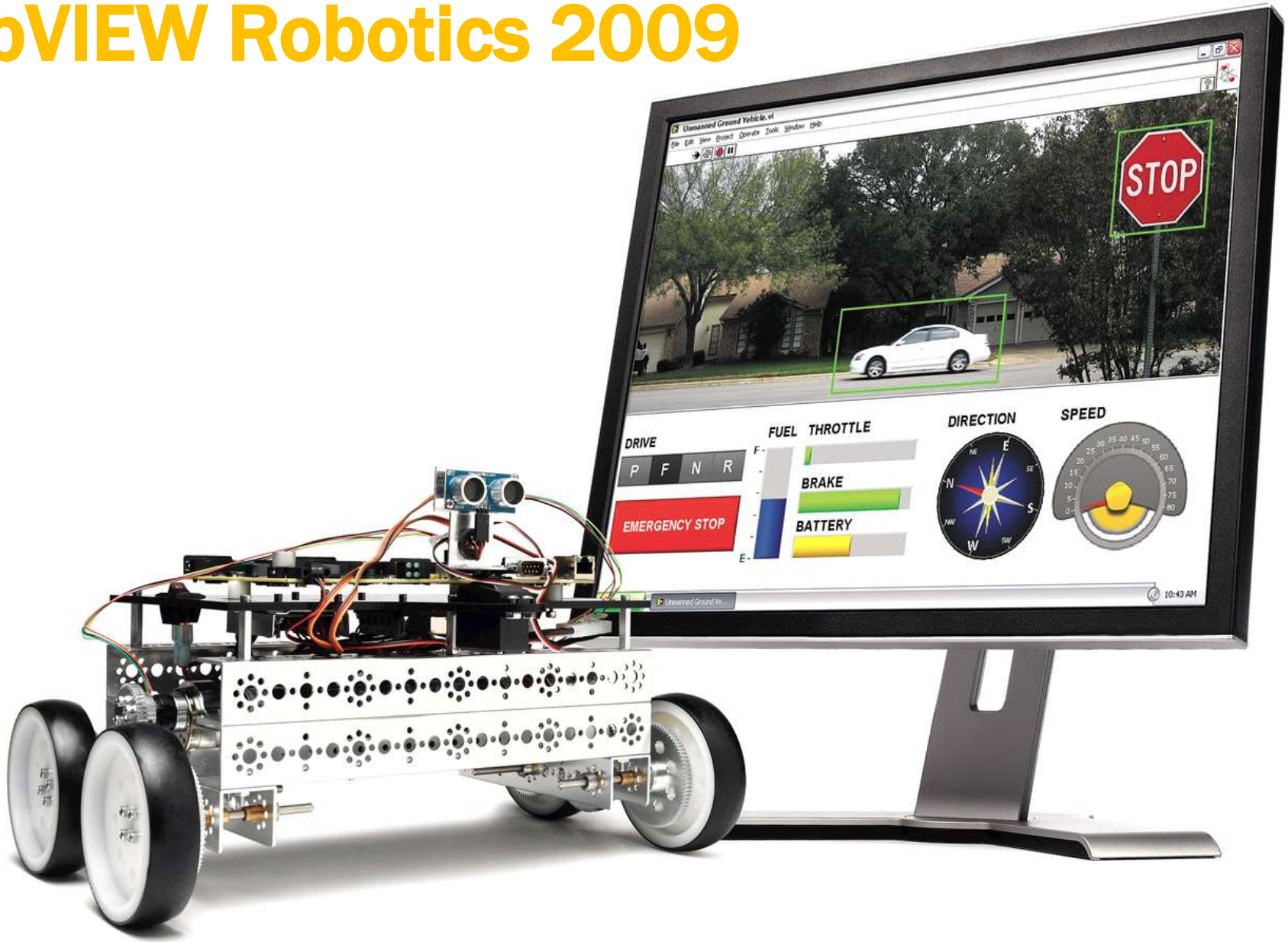
LabVIEW Robotics 2009

LEGO® MINDSTORMS®
NXT LabVIEW Module

ImagingLab Library
for DENSO

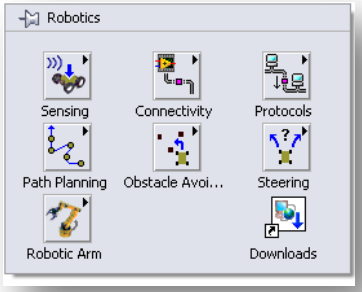
NATIONAL INSTRUMENTS

LabVIEW Robotics 2009

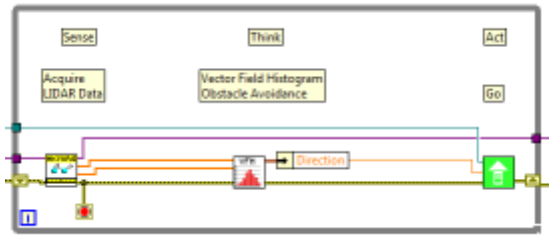


LabVIEW Robotics Key Offerings

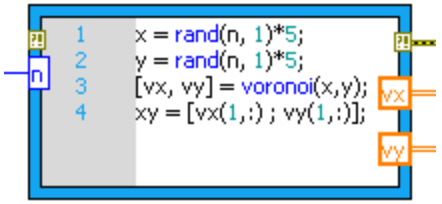
IP for navigation, steering, kinematics and more



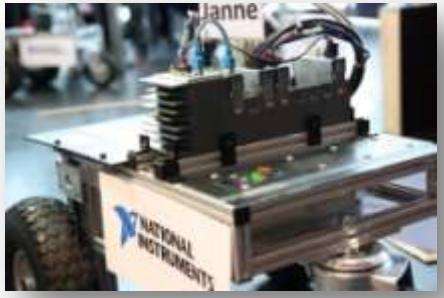
High-level **graphical programming**



Tools for integrating **text-based algorithms**

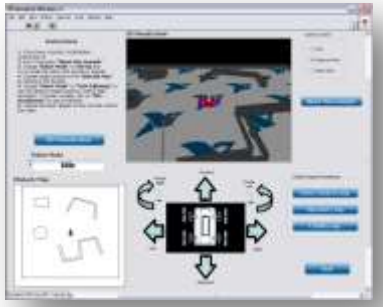


Deployment to Real-Time and FPGA hardware



Connectivity to sensors and actuators from top vendors

Examples of real-world applications



LabVIEW Robotics demo

LabVIEW and Robotics World

LabVIEW Robotics 2009

LEGO® MINDSTORMS®
NXT LabVIEW Module

ImagingLab Library
for DENSO

NATIONAL INSTRUMENTS

Advanced Robotics Applications

- **Pick & Place**

Assembly
Lab Automation
Flexible Manufacturing

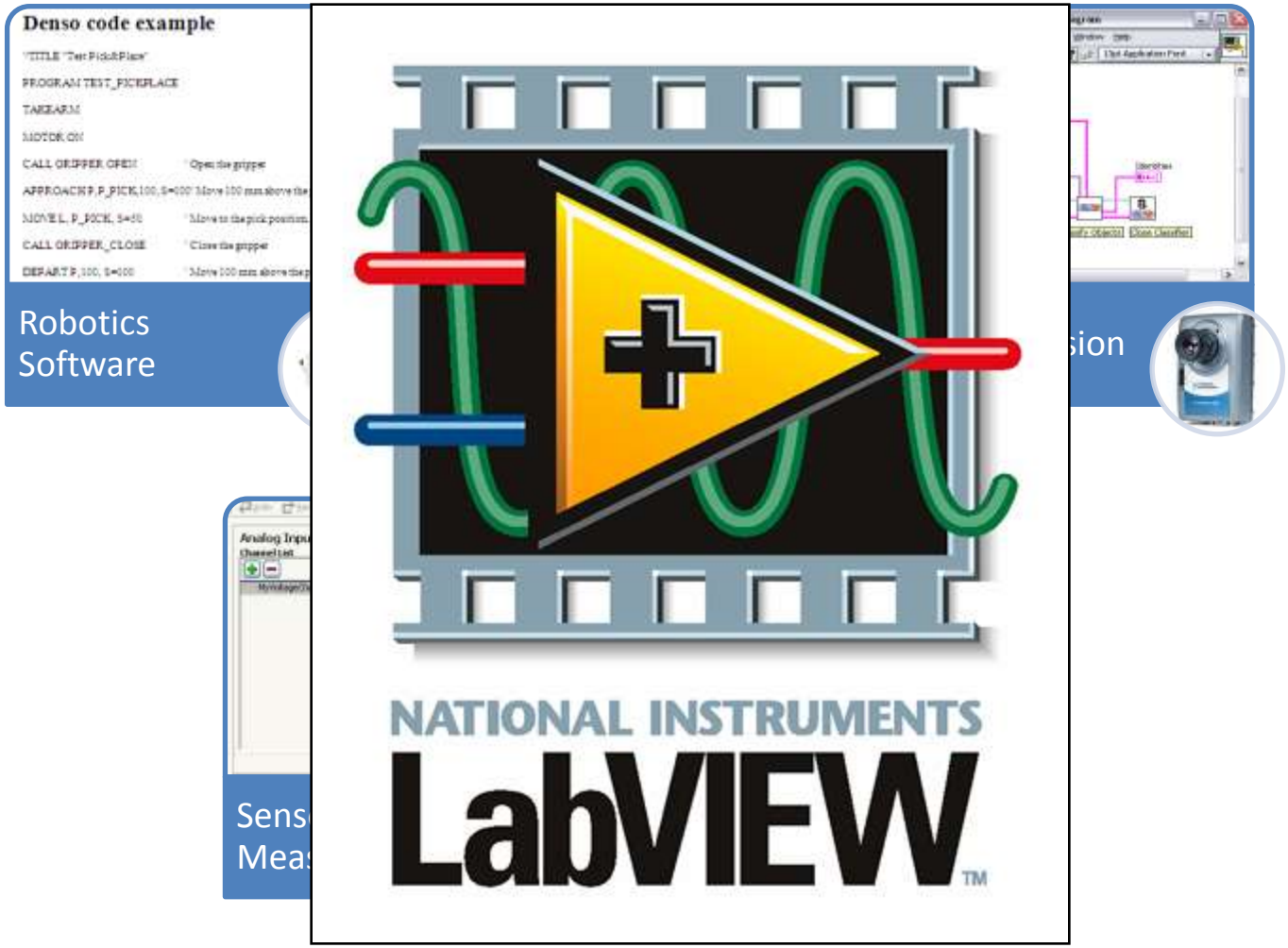
- **Test**

Automated Test
Visual Inspection
Multiple Measurements

- **Material Work**

Polishing
Deburring
Machining

Advanced Robotics Requires a Lot Software



Delivering Innovation Together

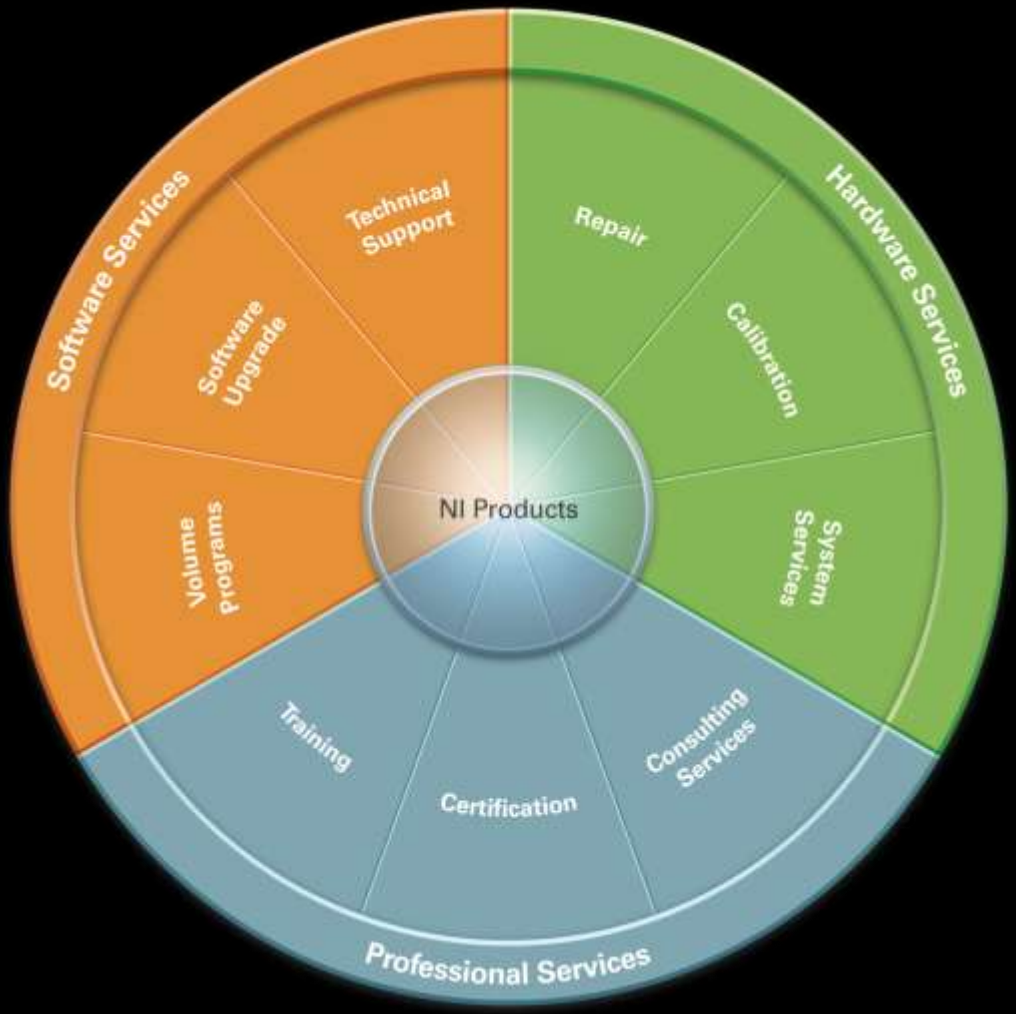
Your Domain Knowledge

and

Graphical System Design
Tools of Innovation

DESIGN → PROTOTYPE → DEPLOY

Ensuring Complete System Success



Do More

[with Graphical System Design]

Partner Introductions

Partner Introductions

National Instruments
NIDays 2010

6TL Engineering

6tl engineering
testing is our core competence

Test & Measurement.

Eurolectron

- In-Circuit (ICT) Test Systems and Test Management Software.
- ICT Test Services, on a Flying Prober or Bed of Nails Tester
- True Modular Base Test Platforms, Functional (FCT) (FCT+ICT)
- Special boards, LED color Detection & Pneumatic Switching
- Mass Interconnect interface systems (VPC Interface)
- Test Fixture Solutions, Fixture kits or Turn-Key (Mech. & Vac)
- Test Probes, other Test Tools and consumables
- Focussed-IR BGA Repair Station and Soldering Tools

CIM Industrial Systems A/S

Danish Company specialized in computer and electronic engineering: Software Solutions and Test Solutions.

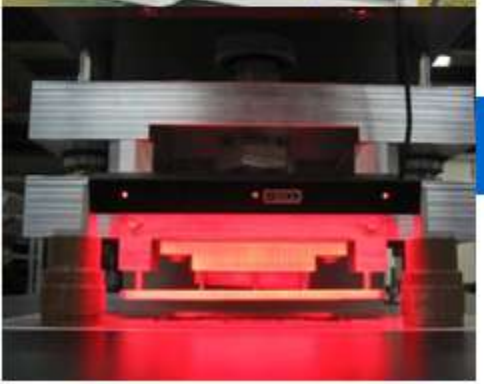
Strong foundation in Green Engineering
(Wind power, Solar power, Fuel Cell, Pump control etc.)

- Turn key solutions
- Consultancy assistance
- Software development
- Project management

FLEXSTAND
New TestStand Operator Interface.
Hear the presentation today

Win an iPod - fill in the competition
and deliver in exhibition to CIM

ES International & CIT Engineering



- System integrator of specialized testing systems
- More than 10 years experience, over 40 people
- Delivering services and turn-key solutions to a wide variety of industries.
- Concurrent Engineering partner joining you in all your project steps

Technical Solutions Towards Quality

NATIONAL INSTRUMENTS
Certified Alliance Partner

Microsoft Certified
Solution Provider

 copyright ES International - 2009

Test Solutions Hasselt, Belgium

JABIL HASSELT

- Design
- Prototpying NPI
- Product Validation
- Total Test Solutions

- Design For Test
- Test Strategy Proposals
- Test Spec Development
- Functional Testers
- SW, HW, BS and Mechanical engineering
- GOS TD Proj.Manag.

→ For internal JABIL
→ For JABIL customers
→ For Local for Local customers

JABIL

LVUG.NL

11:30 – 12:30 Presentatie LVUG.BE /NL en T&M

SQLite

"A LabVIEW interface with a simple open source database engine"

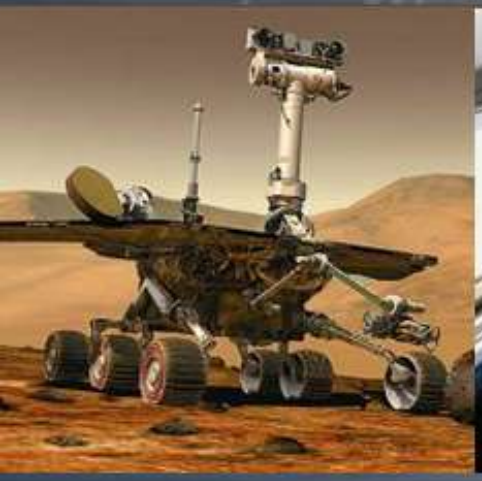
LVUG.BE

LabVIEW User Group

When it really matters…

Productive Development Tools

Save Engineering Time



High-Precision Drive Solutions Are Used Every Day!

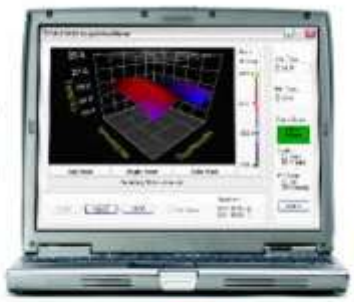
Productive Development Tools

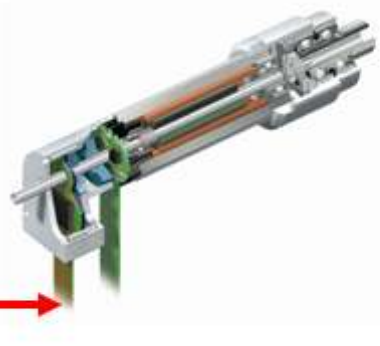
Save Engineering Time

Computer with CAN card

Programming with:

- CANopen Library
- EPOS library





Next EPOS

VI download

Next EPOS

Test & Measurement

Process Control
Automated Test Cells
Realtime Deterministic Execution
High Speed Measurement & Control

Visual Inspection Systems

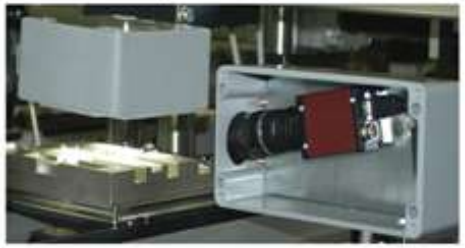
Product Localisation and Identication
Quality Control
Combination with Motion (robots)
Smart Camera

LabVIEW

The LabVIEW software development environment lets us integrate measurement and control functionality with important aspects such as user-friendly visualisation, datalogging, database communication and report generation.

NiniX Technologies

NATIONAL INSTRUMENTS™ Alliance MEMBER



NATIONAL INSTRUMENTS
Select Alliance Partner
Prevas
As a Select Alliance Partner
of National Instruments we are
Committed to your success

T&M Solutions

- Founded in 2001, >9 years experience in delivering Test & Measurement Solutions.
- More than 360 projects succeeded in different industries.
- Offices in Arnhem and Eindhoven,
- LabVIEW Certified Architect
- Experienced in small and large LabVIEW projects.
- Engineering Partner

Mission:

"T&M Solutions BV goal is to increase customer satisfaction in Test & Measurement automation by being a reliable engineering partner. We can achieve this goal with the help of graphical system design tools."

NATIONAL INSTRUMENTS Alliance Member

LabVIEW Certified Developer

What Virinco do...

...we specialize in:

- Automatic Test Equipment
- NI TestStand
- Test Data Management

...helping customers to:

- Organize test & repair data
- Improve production **YIELD**
- Improve product **QUALITY**

virinco

NIDays10
WORLDWIDE GRAPHICAL SYSTEM DESIGN
CONFERENCE

VI Technologies is specialist in delivering automation solutions based on NI LabVIEW.

- Support and consultancy in the area of measurement and automation applications based on LabVIEW and/or TestStand
- Custom LabVIEW software development
- Automated Test and Measurements Systems
- Machine Vision and Motion
- Machine automation
- Training in LabVIEW (object oriented) software architecture
- LabVIEW Realtime, FPGA and Embedded

NATIONAL INSTRUMENTS LabVIEW
CERTIFIED ARCHITECT
CERTIFIED DEVELOPER

NATIONAL INSTRUMENTS
Certified Alliance Partner

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Training Graphical Object Oriented Programming: 20, 21 en 22 april at NI HQ Netherlands

15:45: Tips & tricks to enhance your LabVIEW development experience