LabVIEW NXG: Lightning Advisory Rounds

Come meet the LabVIEW NXG Product Owners and experience how they are engaging with the global LabVIEW community to drive the development of the next generation of LabVIEW. This will be an interactive session where you will have an opportunity to influence the roadmap and design of LabVIEW NXG.
User Interface Building
- Manipulate front panels programmatically
- Configure and manage VIs to execute outside the editor
- Use new controls

Custom Algorithm Design
- Design custom machine vision algorithms
- Design custom filters and control algorithms

Distributed Applications
- Build and distribute EXEs, libraries, installers, and packages

Interoperability
- Integrate LabVIEW NXG with TestStand
- Call external DLLs

Data Management
- Publish tags using simplified data communication VIs
- Create reports in Microsoft Excel

Software Engineering
- Abstract code with object-oriented programming
- Compare VI source code with Diff Tool
- Use more event-driven programming options

Systems Management
- Connect, configure, and document hardware graphically with SystemDesigner
- Design hardware systems offline from a catalog of NI hardware

Web Technology
- Create simple browser-based UIs using WebVI for remote operation and monitoring
- Use Data Service APIs for Device to HMI communication

Hardware Support
- Control additional benchtop instruments
- Use additional electronic test instrumentation
- Integrate machine vision hardware
- Prototype MAC and PHY systems on most software defined radio hardware

Features new in LabVIEW NXG 2.0

January 2018
User Interface Building
- Manipulate front panels programmatically
- Reflect test status in a Data Grid

FPGA Programming
- Design custom FPGA algorithms

Deployed Applications
- Application splash screen
- Apply a hardware configuration with package installers on deployed machines

Interoperability
- Call registered .NET Assemblies
- Interface for MATLAB®

Collaborative Development
- Easily install dependencies required for a project with the package dependencies document
- VI and Class Hierarchy Viewers

Systems Management
- Export NI hardware dependencies in a configuration file (.nihwcfg)

Debugging
- Retain wire values
- FPGA sampling probe

Web Technology
- Event Support in WebVIs
- Host WebVIs on SystemLink Cloud
- Integrate JavaScript code to customize WebVIs

Hardware Support
- Utilize Kintex 7 FlexRIO hardware
- Prototype MAC and PHY systems on most software defined radio hardware

Software Engineering
- Compare Projects with NI Compare Tool
- Native project SCC integration with the SVN SCC Add-On for LabVIEW NXG
- Unit test your code with the IncQuery Labs InstaCoverage add-on
User Interface Building
- Display panels dynamically inside other panels
- Utilize a tree control

FPGA Programming
- Improved compilation workflow

Deployed Applications
- Interact with executables from the command line
- Improved package and installer creation workflow

Deployed Applications
- Import/export .mat files from The MathWorks, Inc. MATLAB®

Collaborative Development
- Build applications and bitfiles with the Command Line Interface

Debugging
- Debug executables

Web Technology
- Design WebVIs for variable sized clients with flexible layout
- Communicate data over WebSockets in WebVIs

Hardware Support
- Configure Ethernet CompactDAQ devices

Software Engineering
- Unit test your code with the IncQuery Labs InstaCoverage add-on
- Document and generate class-based architectures with the VI Technologies UML Class Editor Beta

Features new in LabVIEW NXG 3.1
Design Process

IDEATE
- Exploration
- Brainstorming

REFINE
- Layout
- Visual Hierarchy
- Gestures and Flow

INSIGHT
- User Needs
- Market Trends

EVALUATE
- Technical Feasibility
- Usability Testing
CHRISTINA ROGERS
Engineering UI Building
Front Panel, Controls

DARIN GILLIS
Web Module

JEFF PEACOCK
Advanced Language
Code Conversion and Migration

JON SONENSON
Mainstream Programming
Interop with Other Languages

NICOLE RICHARD
LabVIEW NXG Platform

SAL SANTOLUCITO
Programming with Hardware
LabVIEW RIO Platform

SUMEDHA GANJOO
Sharing Code and Toolkits

TAYLOR RICHE
Applications and Libraries

TJ GIERE
LabVIEW FPGA

LabVIEW NXG Product Owners
How We Are Engaging with Users

- Customer Visits
- User Interviews
- Usability Studies
- NI Forums
- In-Product Feedback
- Customer Experience Program (CEIP)
- Software Test Labs
- NI Software Technical Preview
- Internal Technical Support Team
- Conferences
- Customer Advisory Boards
- ....
How We Are Engaging with Users

- Customer Visits
- User Interviews
- Usability Studies
- NI Forums
- **In-Product Feedback**
  - Customer Experience Program (CEIP)
  - Software Test Labs
  - NI Software Technical Preview
  - Internal Technical Support Team
  - Conferences
  - Customer Advisory Boards
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How We Are Engaging with Users

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Lightning Rounds

Photo by Pixabay from Pexels
<table>
<thead>
<tr>
<th>Stevie Ray Vaughan Statue</th>
<th>Hillside Theater</th>
<th>Lake Travis Zipline</th>
<th>Zilker Park</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Street Art</strong></td>
<td><strong>Umlauf Sculpture Garden</strong></td>
<td><strong>Blanton Museum of Art</strong></td>
<td>Casino el Camino</td>
</tr>
<tr>
<td>Austin City Limits</td>
<td><strong>LabVIEW NXG (Free Space)</strong></td>
<td>Continental Club</td>
<td>Hamilton Pool</td>
</tr>
<tr>
<td>Breakfast Tacos</td>
<td>SXSW</td>
<td>Franklin’s BBQ</td>
<td>Rainey Street</td>
</tr>
</tbody>
</table>
IN-PRODUCT FEEDBACK & PALETTE USABILITY

Jon Soneson
Principal Product Owner, LabVIEW NXG
G Language and Diagram
IDE and Palettes
3rd Party IP Integration
Christina Rogers  
Principal Product Owner - LabVIEW NXG

Focus areas
- VI Panel
- Control References
- User Interface (UI) Events
- Web UIs

I’ve been in LabVIEW R&D for over twenty years. I’ve been a developer and a User Experience (UX) engineer. Now as a Product Owner, it’s an honor to represent your perspective when developing features and striving to create the best experience for scientists and engineers.
Random fact
Tree Control in LabVIEW
Options, properties, and methods
<table>
<thead>
<tr>
<th>Item</th>
<th>Left Cell String</th>
<th>Child Text</th>
<th>Child Tag</th>
<th>Item Indent</th>
<th>Child Only?</th>
<th>Glyph Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Parent</td>
<td></td>
<td></td>
<td>0</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Child Text</td>
<td></td>
<td></td>
<td>1</td>
<td>T</td>
<td>1</td>
</tr>
</tbody>
</table>
NXG – a Different Approach

- Terminal represents the cells
- Selection is a property
Future Features

- Item name separate from “hierarchical location”
- Checkboxes for row selection
- More cell data types
  - Numeric
  - Drop-down selectors
  - LEDs
  - Images
  - Buttons
- Sorting – column header toggle for ascending/descending
- Filtering
- Hidden columns
- Customizing cell appearance
- Insert, delete, and move items interactively
- Tree traversal API
- Drag and drop to/from other controls
Help me prioritize your tree objectives

- Previously, I prioritized:
  - “I need to display test results with hierarchical organization.”
  - “I need to select items so that I can configure them in a secondary UI.”

- Please vote for one of the following:
  A. "I need to edit items quickly within my grid."
  B. “I need to create, remove, and edit steps of a sequence.”
  C. “I need to represent hierarchies in databases and file systems.”
  D. “I need to handle many items, so sorting and filtering is important.”
Darin Gillis
Principal Product Owner - LabVIEW NXG

Focus areas
- LabVIEW NXG Web module
- Web-related features in LabVIEW 202x

3-time Presenter at South by Southwest (SXSW)

17-years at NI in 4 Distinct Roles
17 Years of Desks
Enough about Me
Let's Talk about YOU
How many people have created a WebVI?

I want to hear your story afterwards!
A plugin is needed to display this content.
*No web development expertise required*
We want YOUR feedback!

Join the Web Module Lead User Forum!
https://forums.ni.com/t5/groups/groupmemberspage/group-id/1331/tab/requests

And you may get to Participate in a Usability Study…
How you used to open and run a WebVI in Chrome…
The Story of the Split Run Button
A 16 Week Journey: “How do you see WebVI in Chrome?”

Dec 2018
User Testing

Problem identified

Idea

Code submitted

Solution available to you

May 2019
Release

Dec 2018
User Testing

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Idea

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Solution available to you

May 2019
Release
What types of 3rd party integration is required for you?

A – NI-provided Web Server running on Windows meets my needs
B – I need to be able to host via 3rd Party Servers (Apache, Linux,...)
C – I need to put non-NI controls on a Panel
D – I need to interface with open-source web protocols (JavaScript API)
Applications and Libraries
Asking forgiveness for PPLs
Plugin Architectures in G
RANDOM FACT
IMPROVING OOP USABILITY

Previously noticed frustration with class and type gestures

That couldn’t continue!
SO WE LISTENED... AND WE CHANGED PRIORITIES
SO WHAT DID WE CHANGE?
JEFF PEACOCK

Scripting in G

Actor Framework

Advanced OOP Techniques
RANDOM FACT
VOTING TIME!
DOTTED PROPERTIES

DUPLICATE CLASS
We Want Your Feedback!

- Fill out the back of your BINGO card
- Opt-in to CEIP
- Use LabVIEW NXG in-product feedback
- Join the NI Software Technical Preview
- Engage with us on the NI Forums
- Come talk to us right now
Before you go, take the survey.
Stay Connected During and After NIWeek

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twitter.com/niglobal
youtube.com/nationalinstruments
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- View Weekly Schedule
- Find Your Session
- Build Your Schedule

More Information at ni.com/niweek