



NETWORKS

Top Educators' Secrets

**For Creating Star
Students**

Presented by MATEC NetWorks

2/7

The webinar will begin at 1pm Eastern Time.
In the meantime we recommend you perform an Audio Check.
Go to Tools → Audio → Audio Setup Wizard.

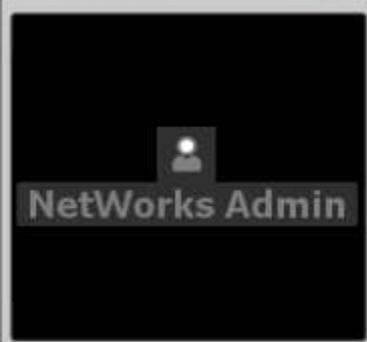
Brought to you by ...



NetWorks is a part of MATEC, a member of Workforce Development in the Division of Academic and Student Affairs.



Advanced Technological Education program
DUE 1104159



NetWorks A...
Moderator

MAIN ROOM (3)

NetWorks Admin
Moderator (You)

mike mac

mike pc #2

- You joined the Main Room. (12:33 PM) -
- Your chat permission has been enabled. (12:33 PM) -

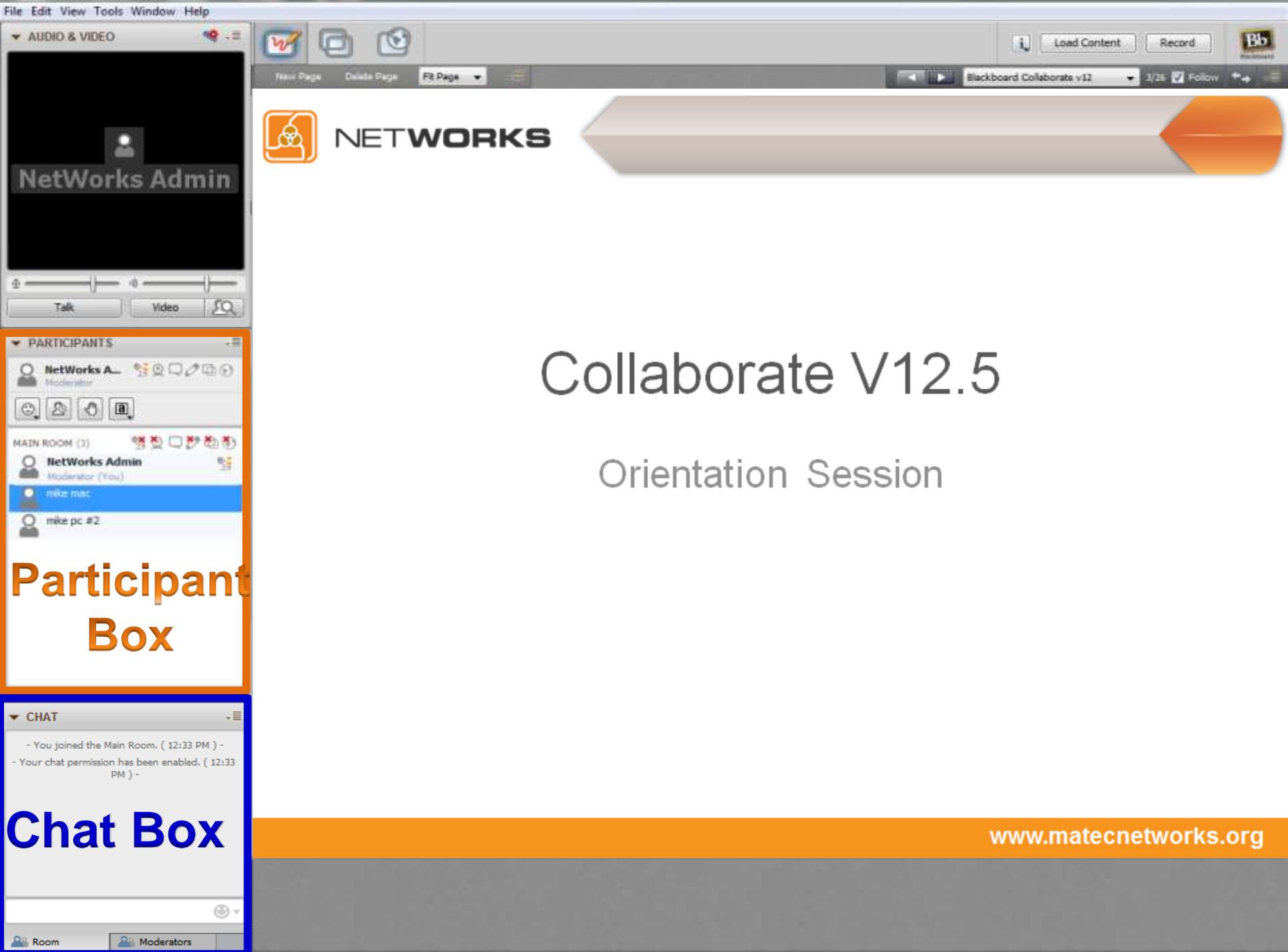


NETWORKS

Collaborate V12.5

Orientation Session

Whiteboard

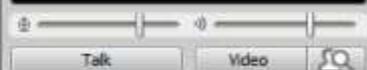
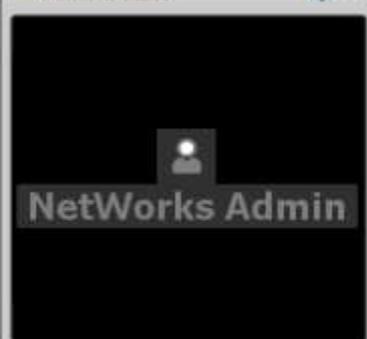


Collaborate V12.5

Orientation Session

**Participant
Box**

Chat Box



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Chat Box



Blackboard Collaborate v12 3/25 Follow



NETWORKS

Collaborate V12.5

Orientation Session

Send Questions and Message Here

www.matecnetworks.org



NETWORKS

Top Educators' Secrets

For Creating Star Students

Presented by MATEC Networks

2/7

Recording Begins

Do Engineering: Top Educators' Secrets for Creating Star Students

Dave Wilson

Director of Academic Programs, National Instruments



Dave Wilson
Director of Academic Programs,
National Instruments



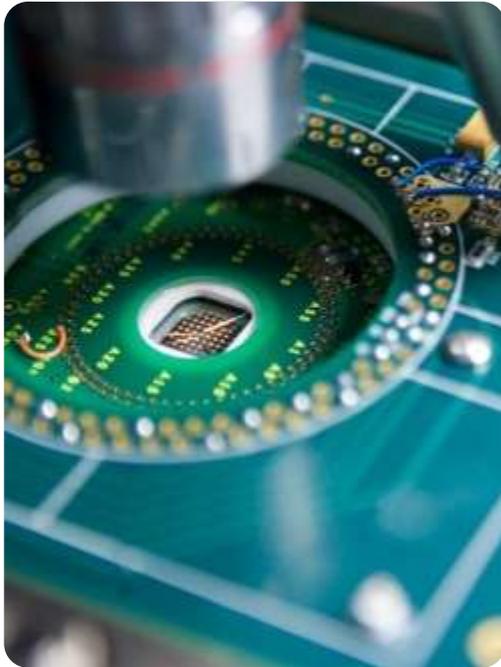
Mark Walters
Academic Marketing Manager
National Instruments

In today's webcast...

- Reveal the top educators secrets to producing star students
- Answer challenges to increase industry-ready students

National Instruments—Our Mission

We equip engineers and scientists with tools that accelerate **productivity, innovation, and discovery.**



National Instruments—Customers

Over 35,000 companies using NI technologies



SpaceX capsule one step closer to manned flight, says NASA

The CHRISTIAN SCIENCE
MONITOR

theguardian

Higgs boson: the definite article?



Start thinking about
5G wireless **CNN**Money

Academia to the Workplace



Do Engineering.

Academia



Academia to the Workplace



Do Engineering. Engineer Anything.

Academia

Industry



$$\frac{V_s}{V_p} = \frac{N_s}{N_p} \quad P = I^2 R = \frac{V^2}{R}$$

$$\beta^2 = \frac{\mu}{\rho}$$

$$C(s) = \left(K_p + K_i \frac{1}{s} + K_d s \right)$$

Producing Star Students



Outreach



Retention

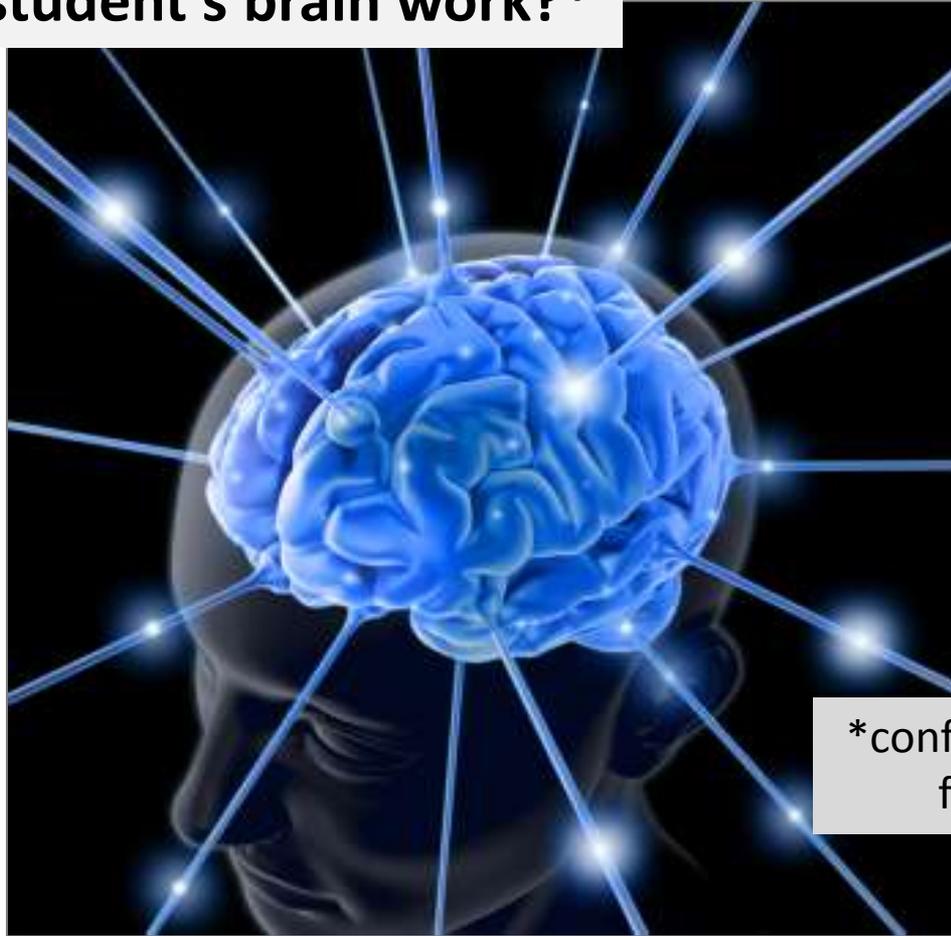


Graduation

Secret #1 for Outreach

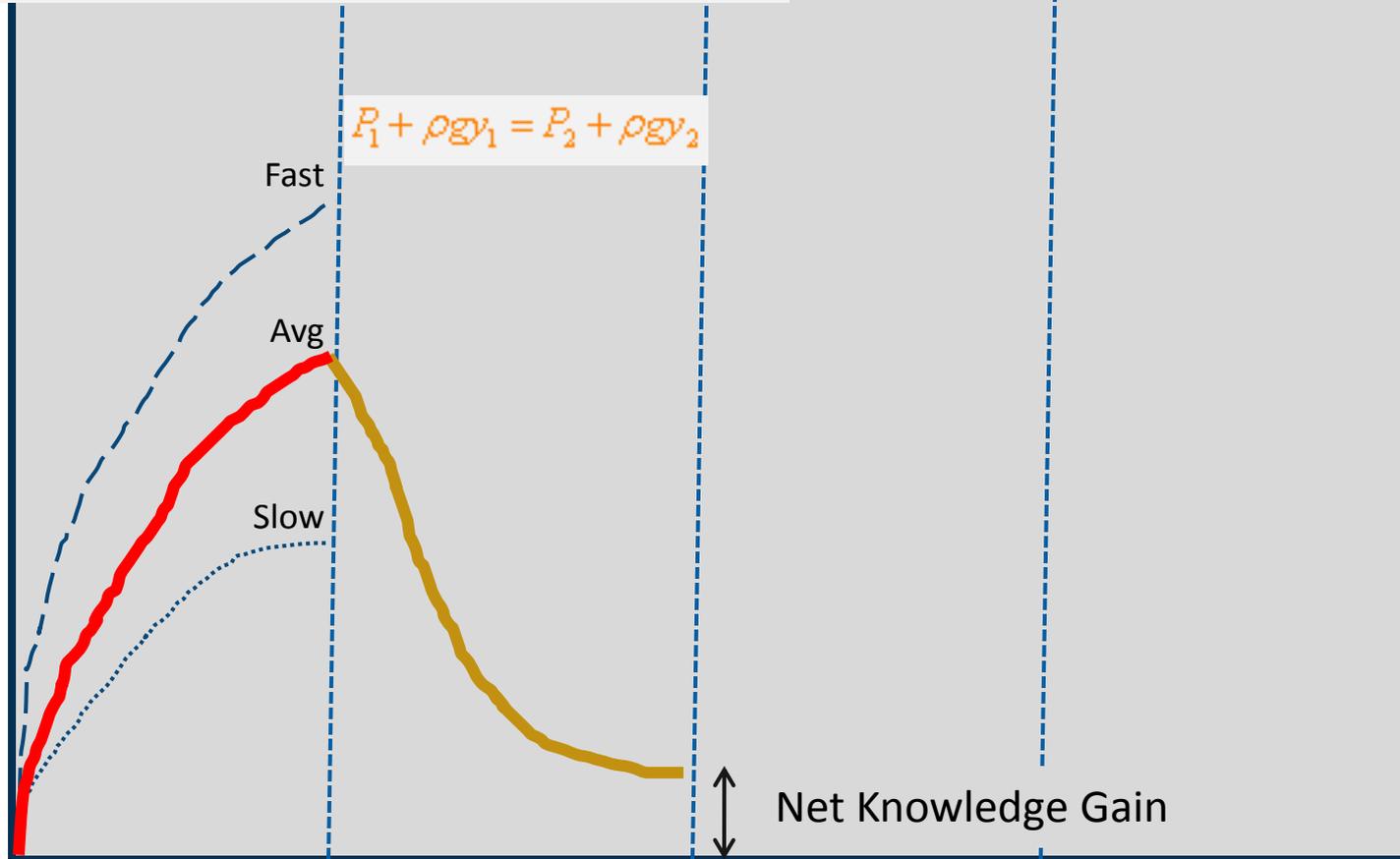
Challenge Creates Curiosity

How does a student's brain work?*

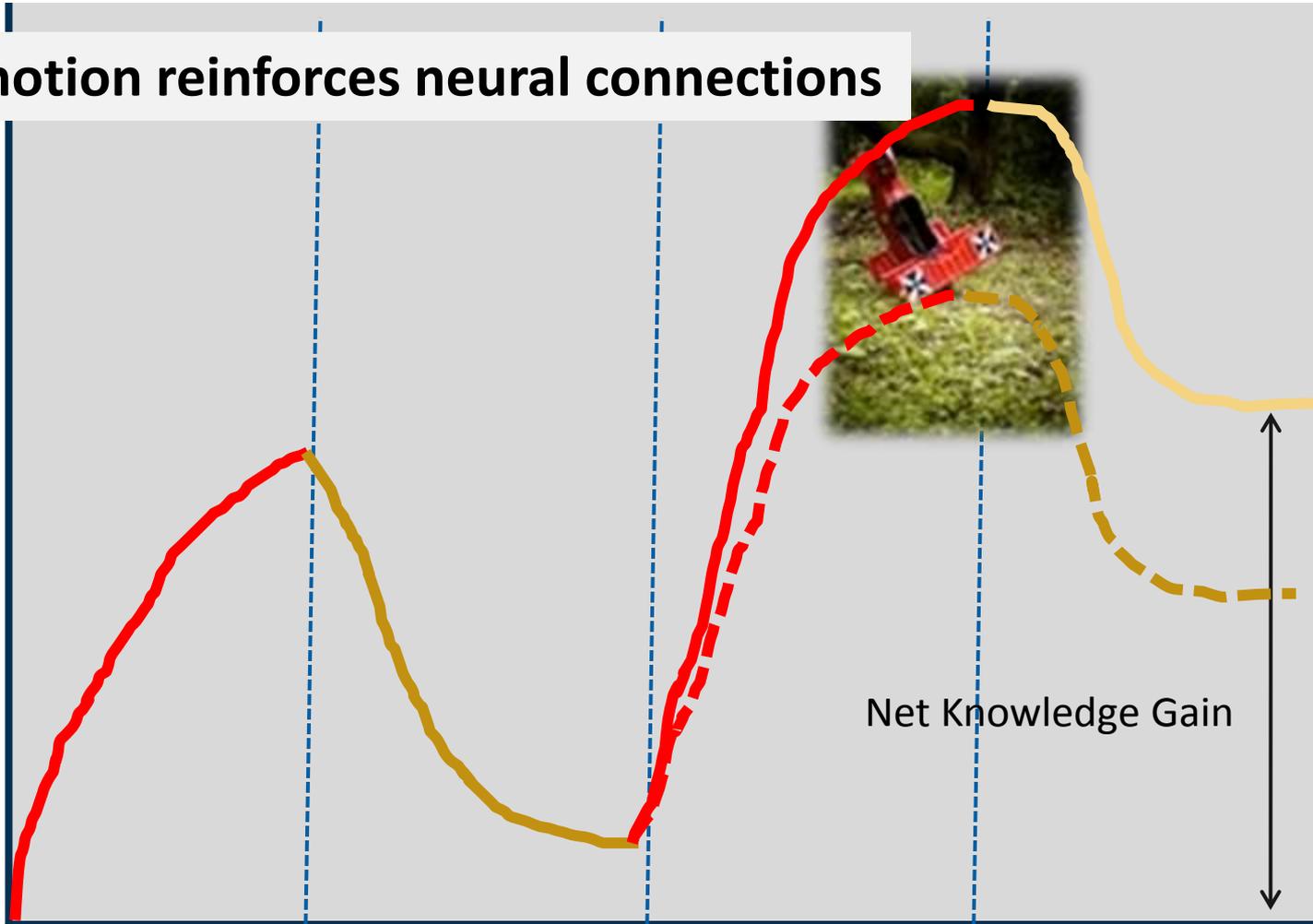


*confounded teachers
for centuries!

Training a biological neural network



High emotion reinforces neural connections



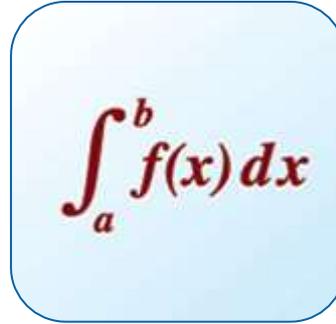
Secret #2 for Retention

Tools Enable Experimentation

Elements of the System



**Measurement
and Control I/O**



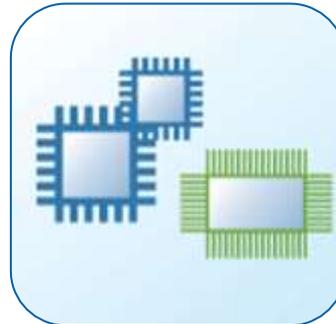
**Math and
Analysis**



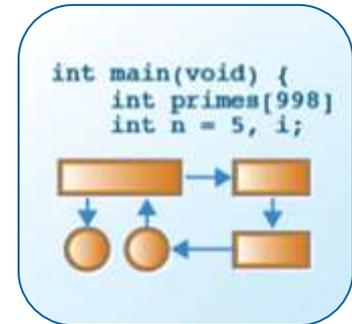
User Interface



Deployable Targets



**Commercial
Technology**

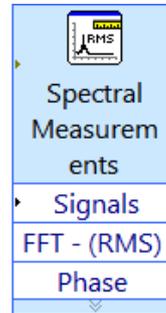


**Models of
Computation**

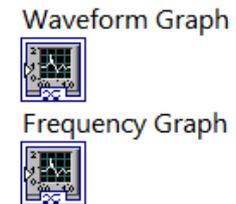
Compatibility



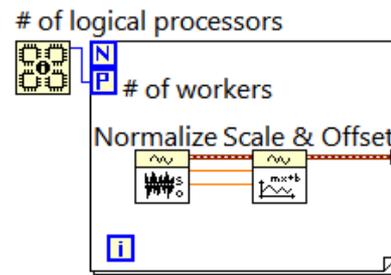
Measurement and Control I/O



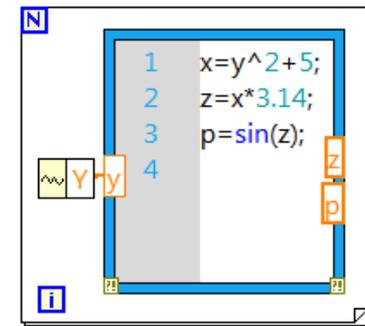
Math and Analysis



User Interface

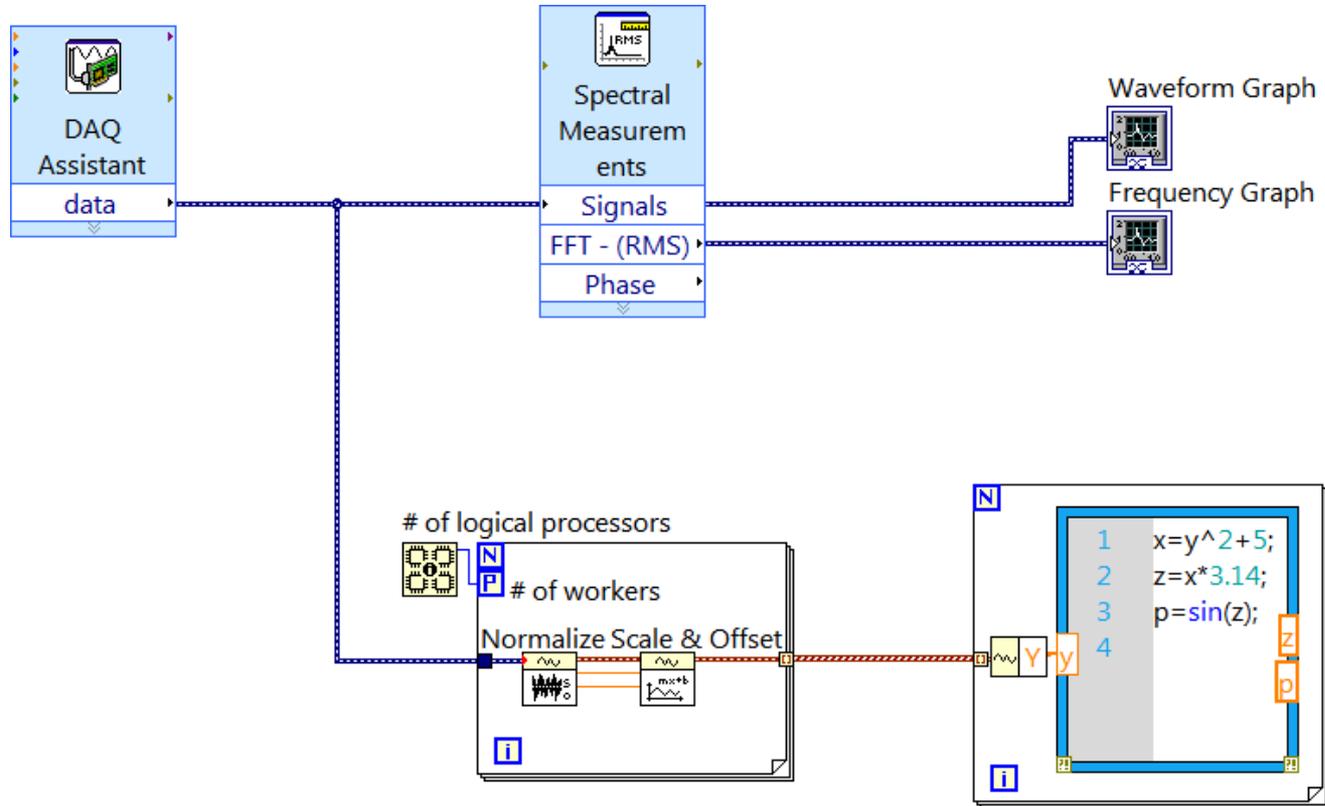


Commercial Technology



Models of Computation

Integration



ms

- 1 kHz
- dt 1000
- 32 100
- 2

DAQ Assistant
data

Spectral Measurements
Signals
FFT - (RMS)
Phase

Waveform Graph
Frequency Graph

of logical processors
of workers
Normalize Scale & Offset

```
1 x=y^2+5;  
2 z=x*3.14;  
3 p=sin(z);  
4
```

National Instruments Education Platform

Circuits and Electronics



Measurements & Instrumentation



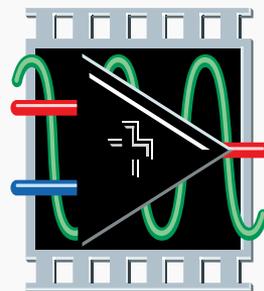
RF and Communications



Controls and Robotics



Student Design



NATIONAL INSTRUMENTS
LabVIEW.

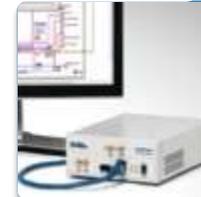
NI Multisim
NI ELVIS



NI myDAQ



NI USRP



NI CompactRIO,
DaNI 2.0

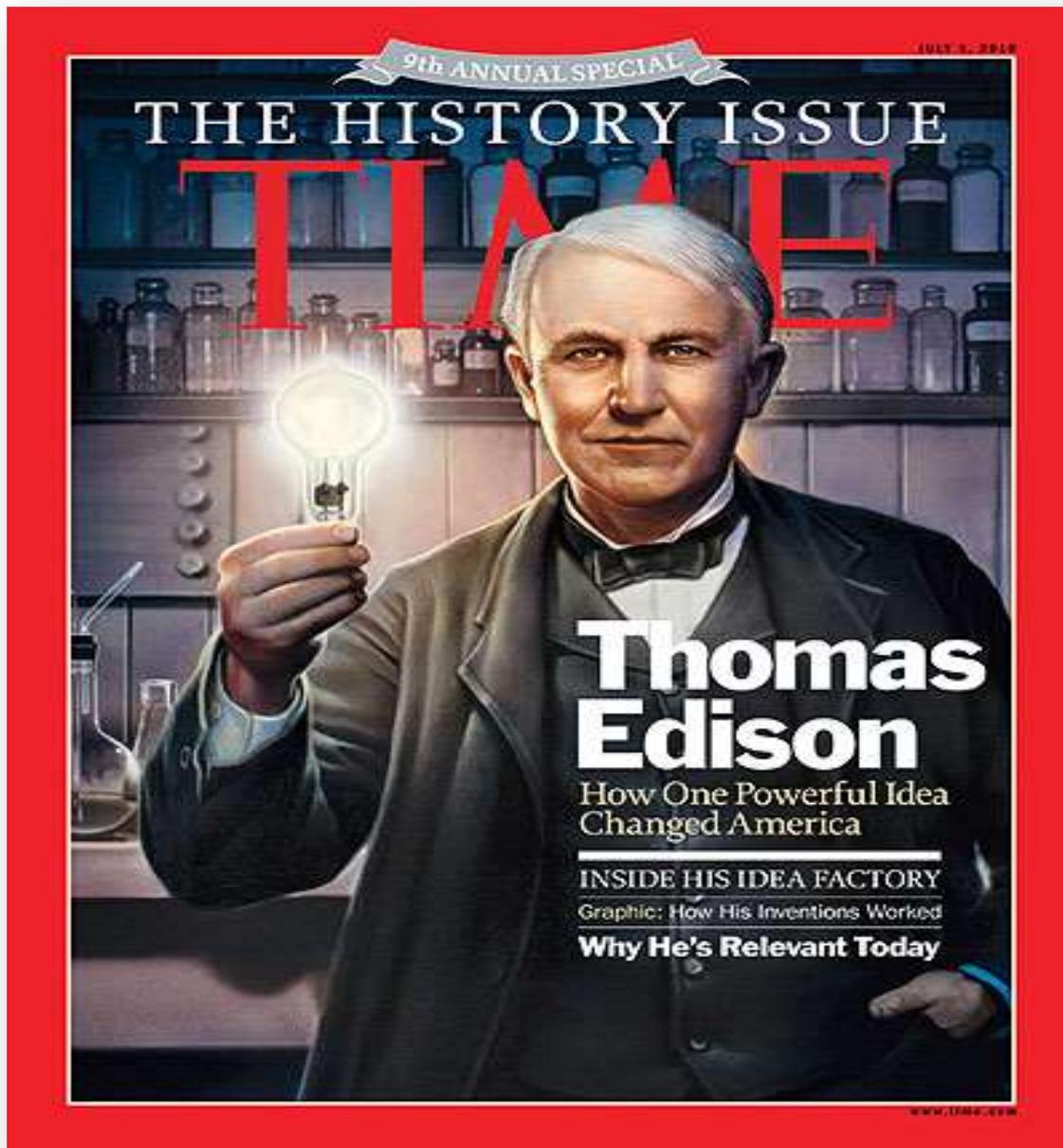


LabVIEW Interface
for Arduino



Secret #3 for Graduation

Experimentation Reveals Viability





Do Engineering

Question Break

Do Engineering: In the Lab



NI Multisim Circuit Simulation Environment

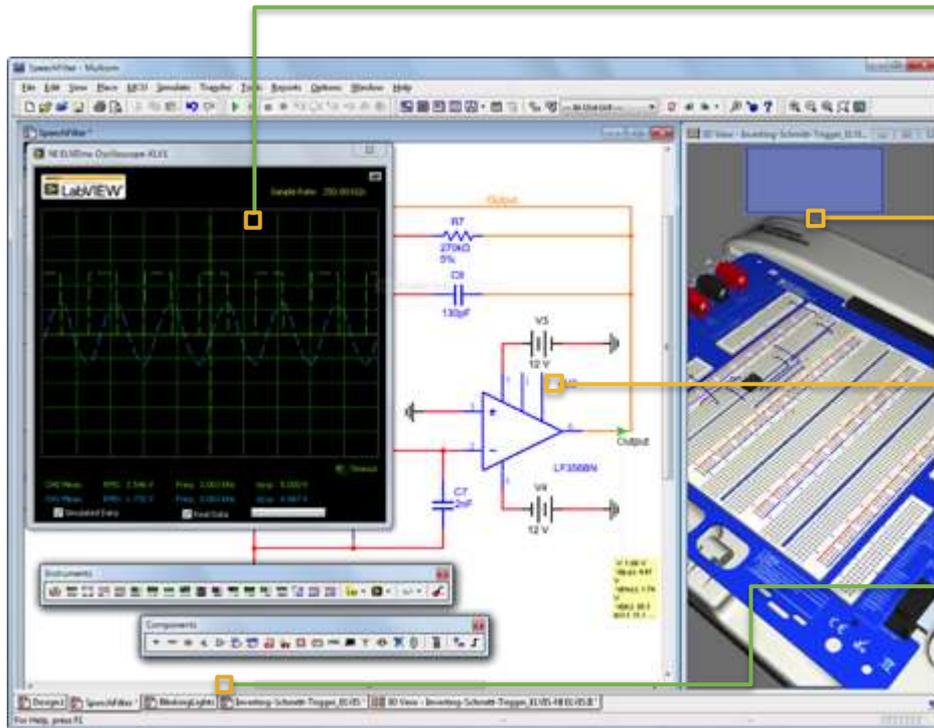
Multisim is the cornerstone of the NI circuits teaching solution and reinforces electronics fundamentals while preparing students for the laboratory. The pedagogical features of Multisim are built into an intuitive interface powered by industry-standard SPICE simulation.

Interactive and rated components

3D breadboard integration

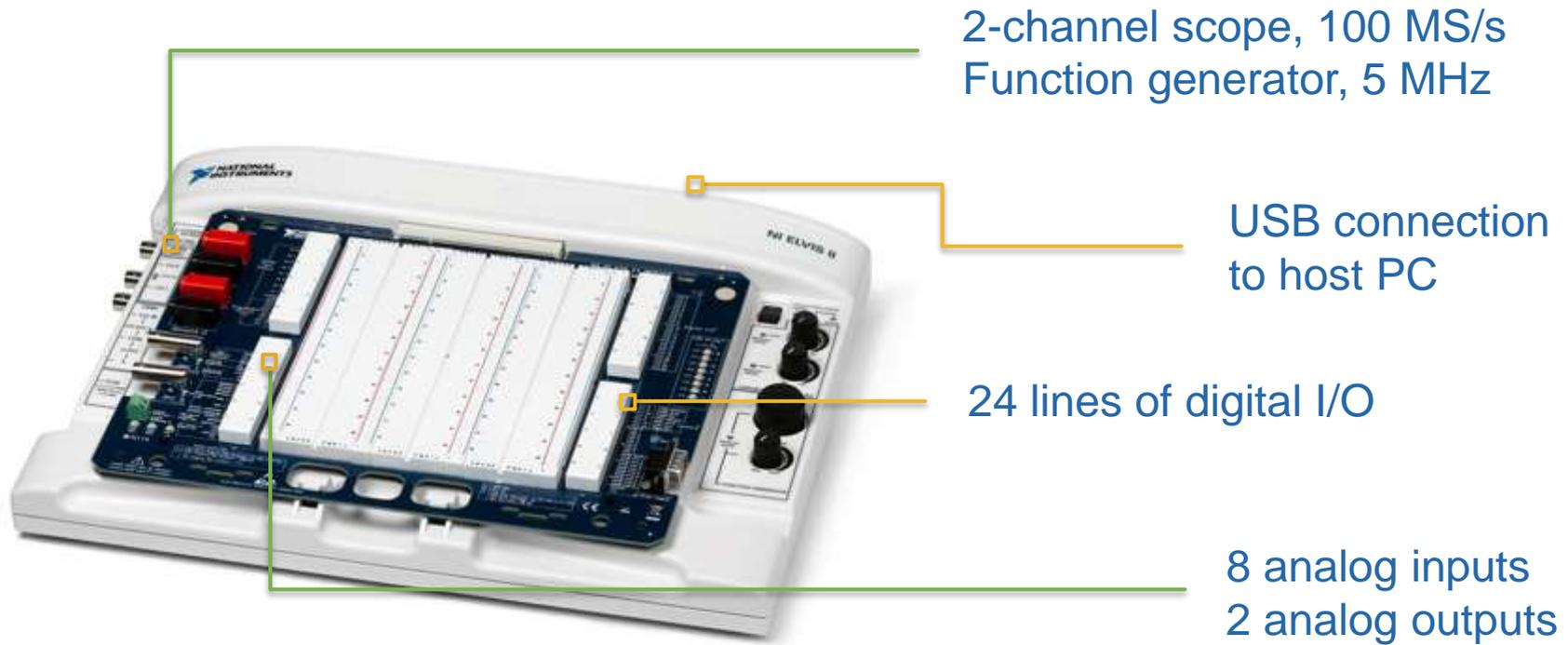
SPICE models for industry parts

Export to NI Ultiboard to lay out PCBs

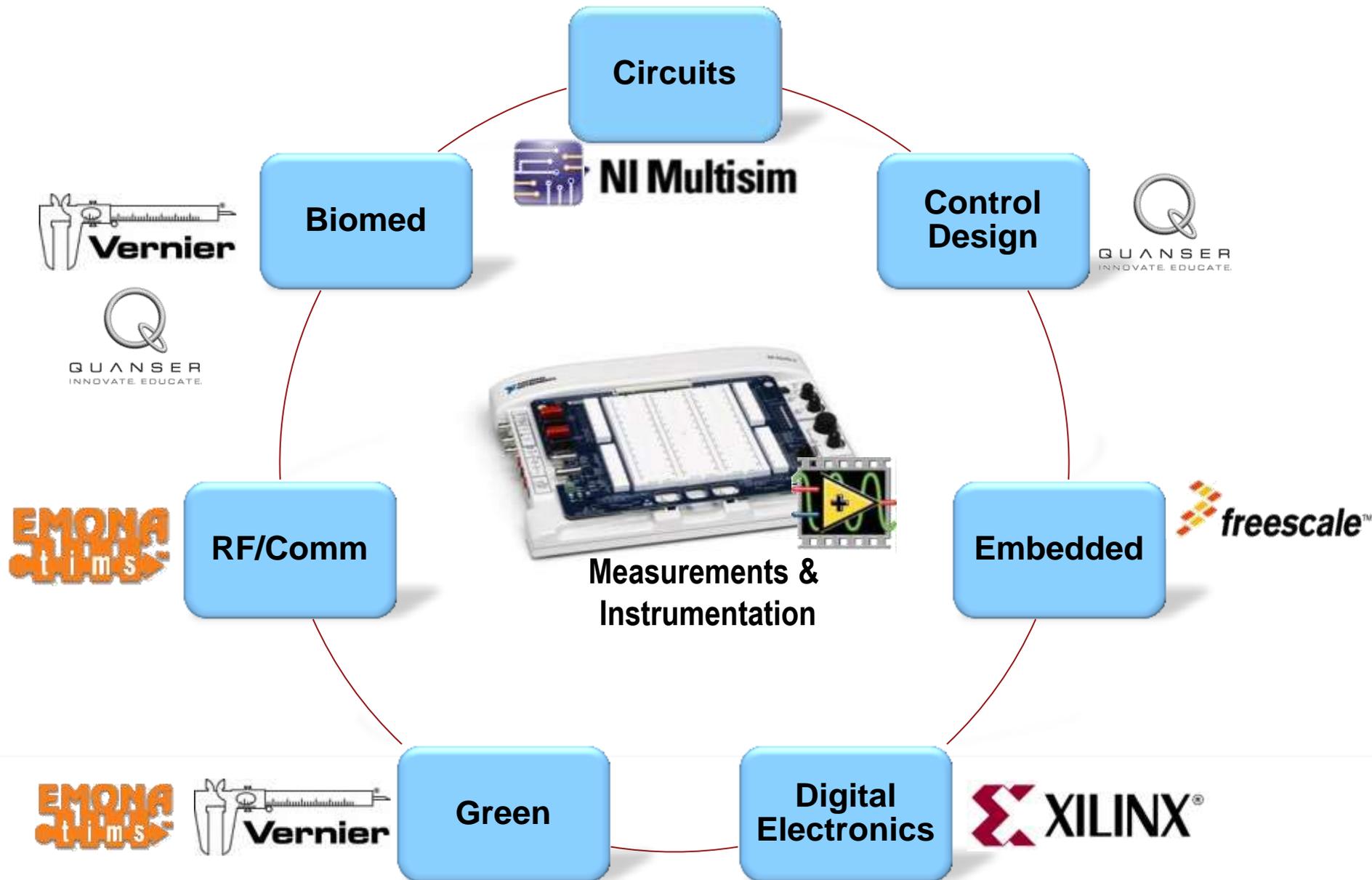


NI ELVIS

Designed specifically for education, the NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) has the flexibility to engage students in comprehensive experiments with 12 common lab instruments (including an oscilloscope, function generator, and Bode analyzer) in a single device.

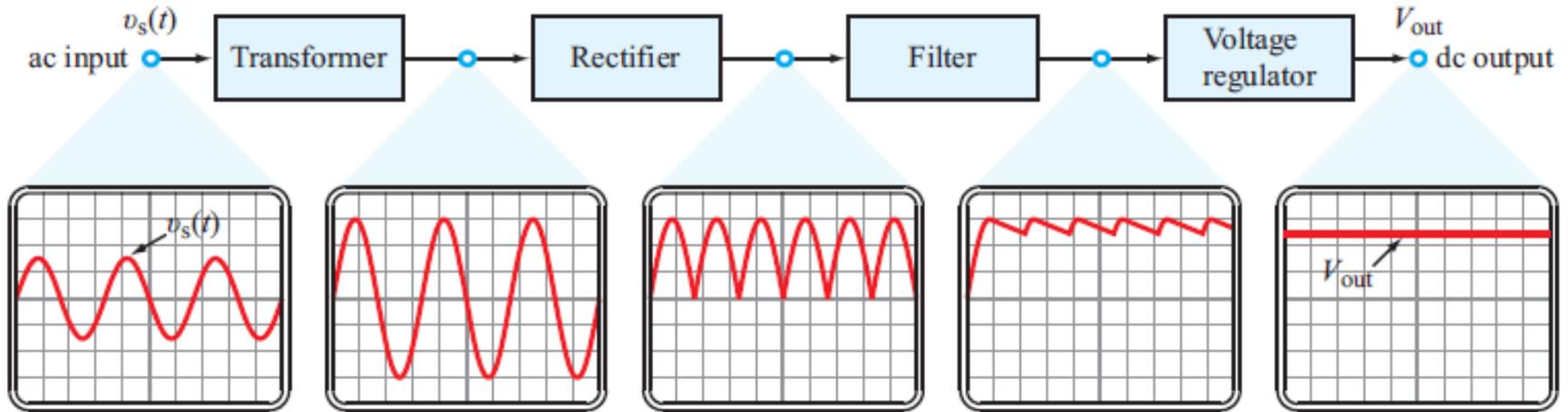


NI ELVIS Laboratory Instrumentation Platform

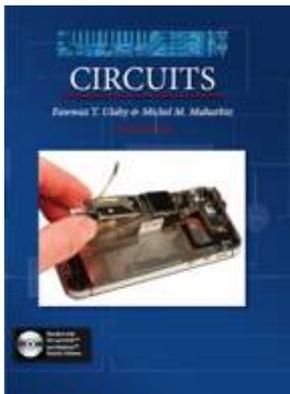


Do Engineering

Understanding the DC Power Supply



Block Diagram of the DC Power Supply*



*Reference:
CIRCUITS, Second Edition
Fawwaz T. Ulaby &
Michel M. Maharbiz
Pages: 387-391

Do Engineering: Anywhere, Anytime

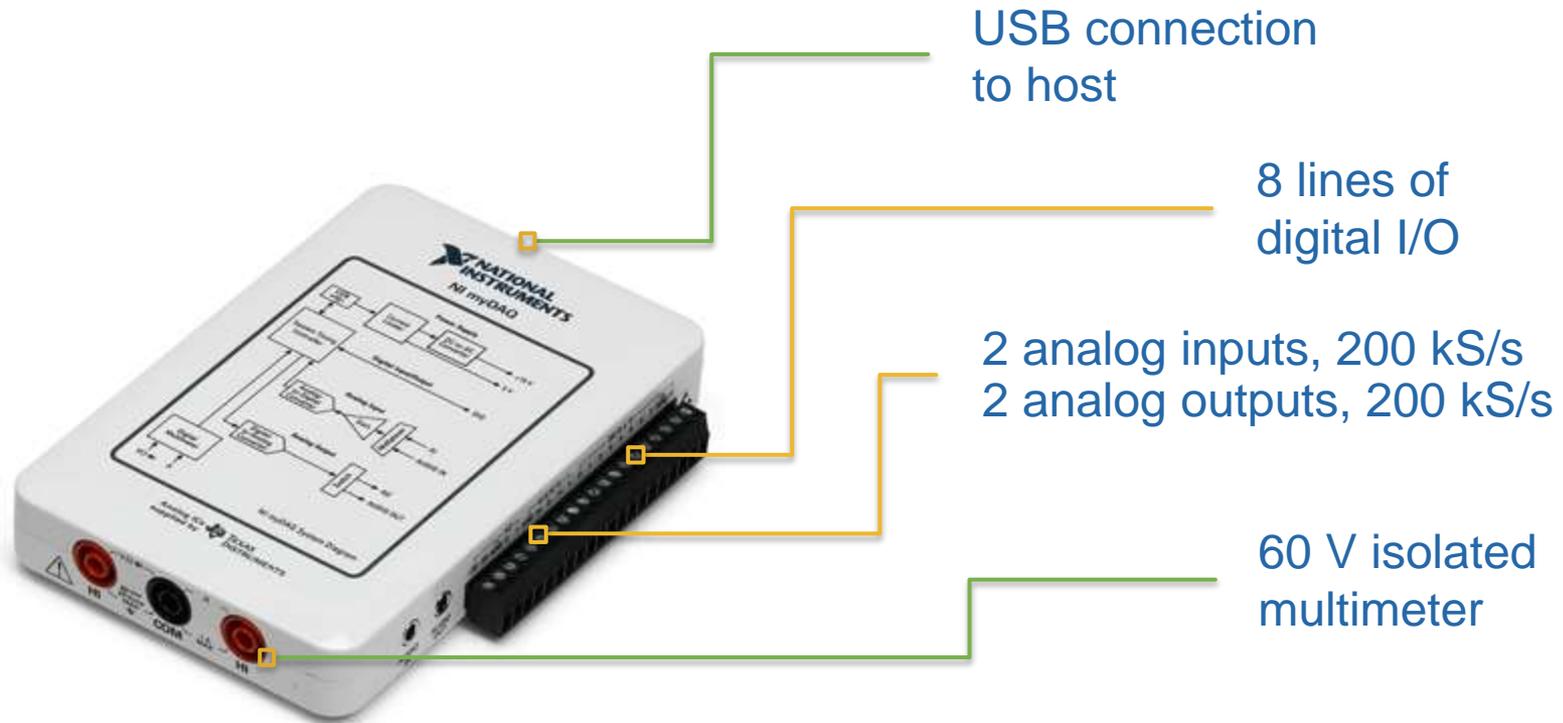


Analog ICs Supplied by

 **TEXAS
INSTRUMENTS**

NI myDAQ

Designed to expose students to a hands-on learning and project development experience anywhere at any time, the compact and portable NI myDAQ integrates eight common lab instruments into one student-ready device.



NI myDAQ Student Owned Instrumentation Platform



mySolarTracker
Solar Tracker

myGrid
Smart Grid



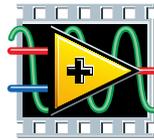
myWing
Wind Tunnel/Air Foil System



myHeli
Vertical Take-off & Landing System



myTurbine
Wind Turbine



myFarm
PV Drip Irrigation



myDyno
Dynamometer System



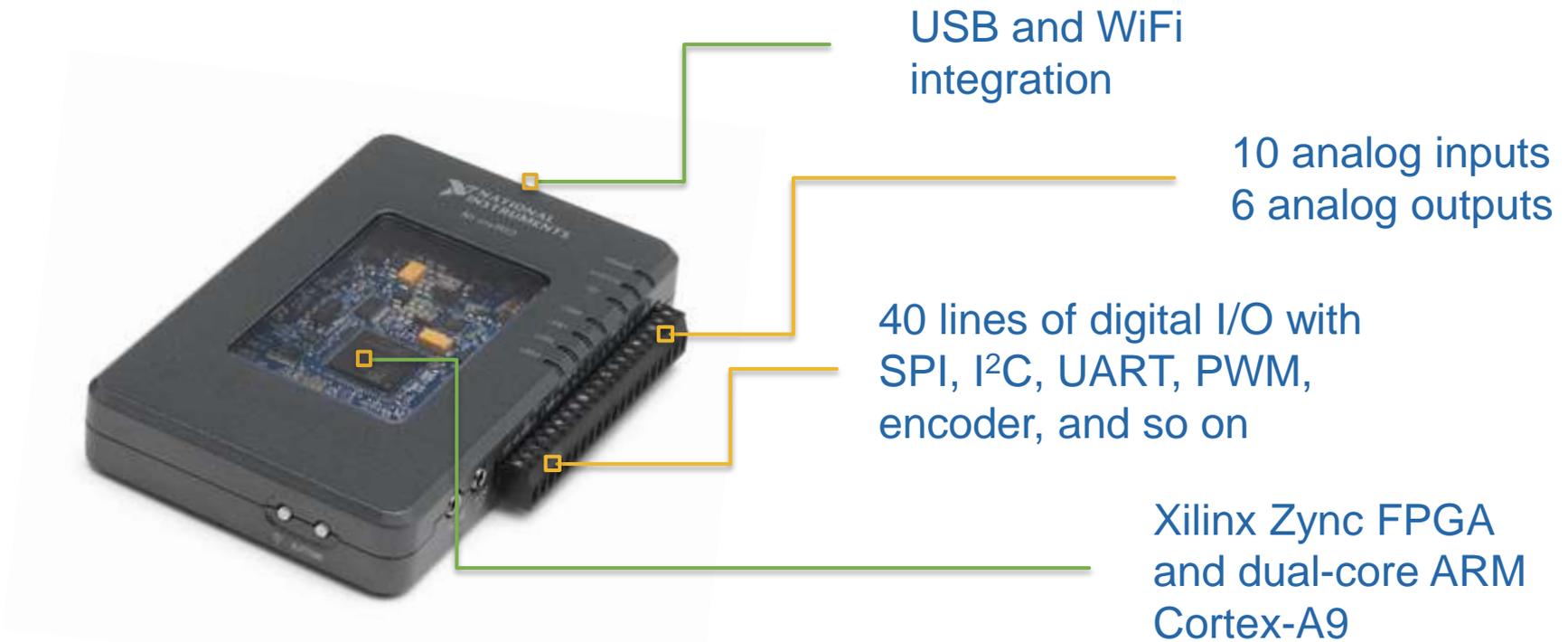
Do Engineering

Do Engineering In Controls, Mechatronics, and Robotics



NI myRIO

NI myRIO places the power of real-time performance and customizable I/O in the hands of students. With this integrated hardware and software tool, students can quickly create applications on the NI myRIO real-time processor to take advantage of a default FPGA personality that they can customize as projects become more advanced.



Do Engineering



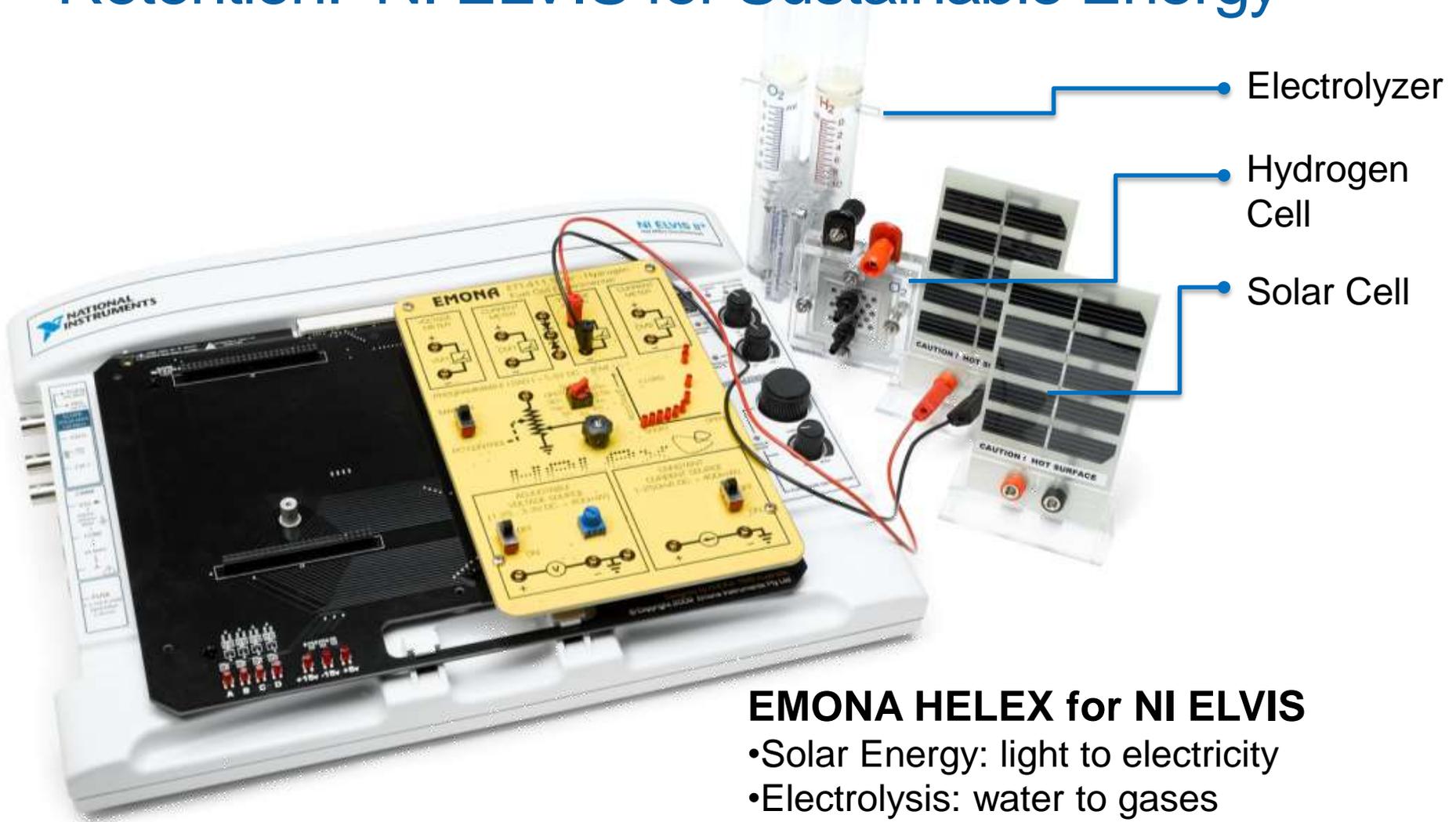
Energy



Outreach: Connecting a myGrid for NI myDAQ



Retention: NI ELVIS for Sustainable Energy



Electrolyzer

Hydrogen Cell

Solar Cell

EMONA HELEX for NI ELVIS

- Solar Energy: light to electricity
- Electrolysis: water to gases
- Hydrogen Fuel Cells: gases to electricity



Graduation: Test the Durability of a Wind Turbine





Controls and Mechatronics

Outreach: Control the Speed



Retention: Designing a Pendulum to Balance



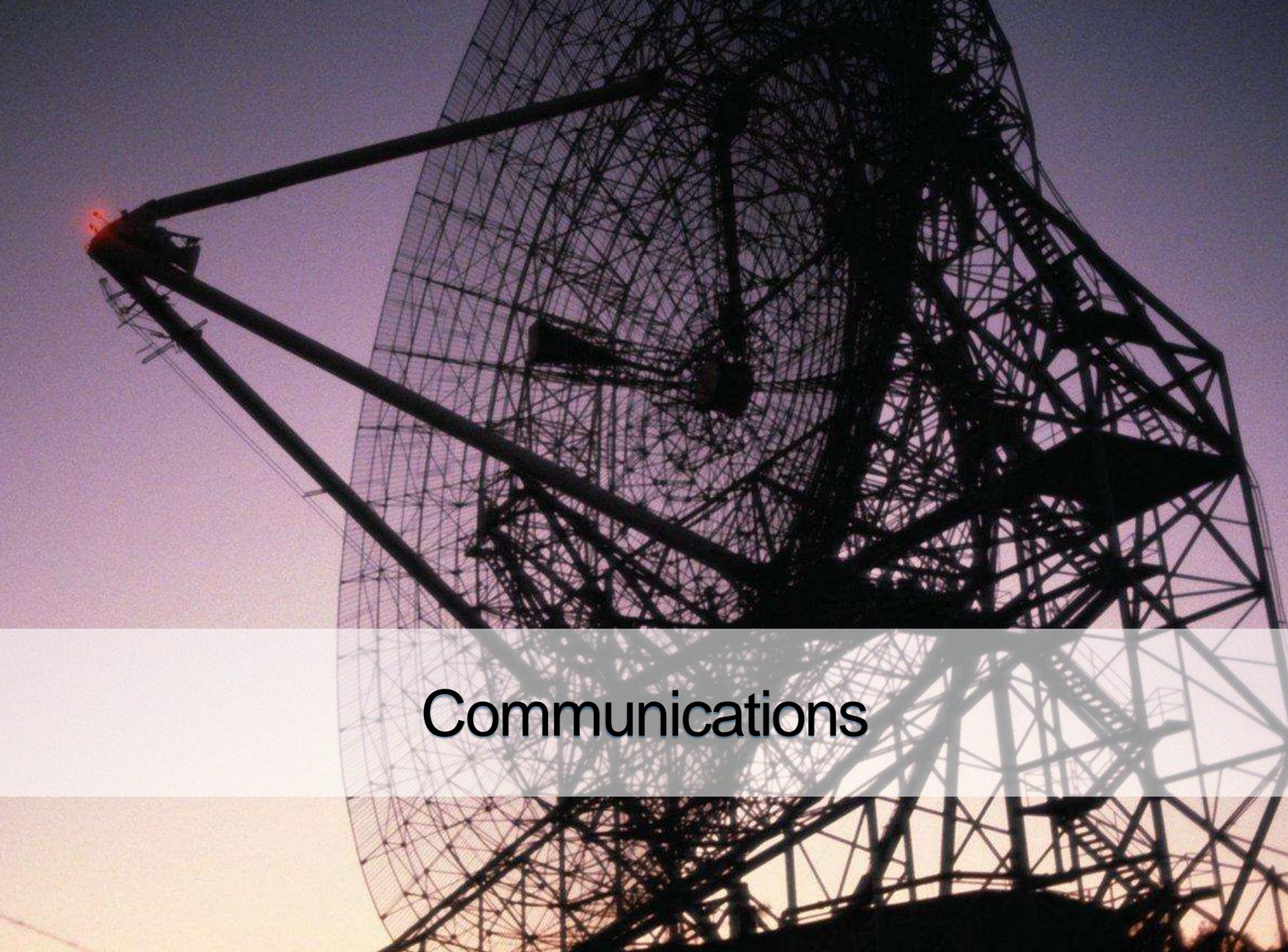
QNET Rotary Inverted Pendulum Trainer



Blind Driver Challenge

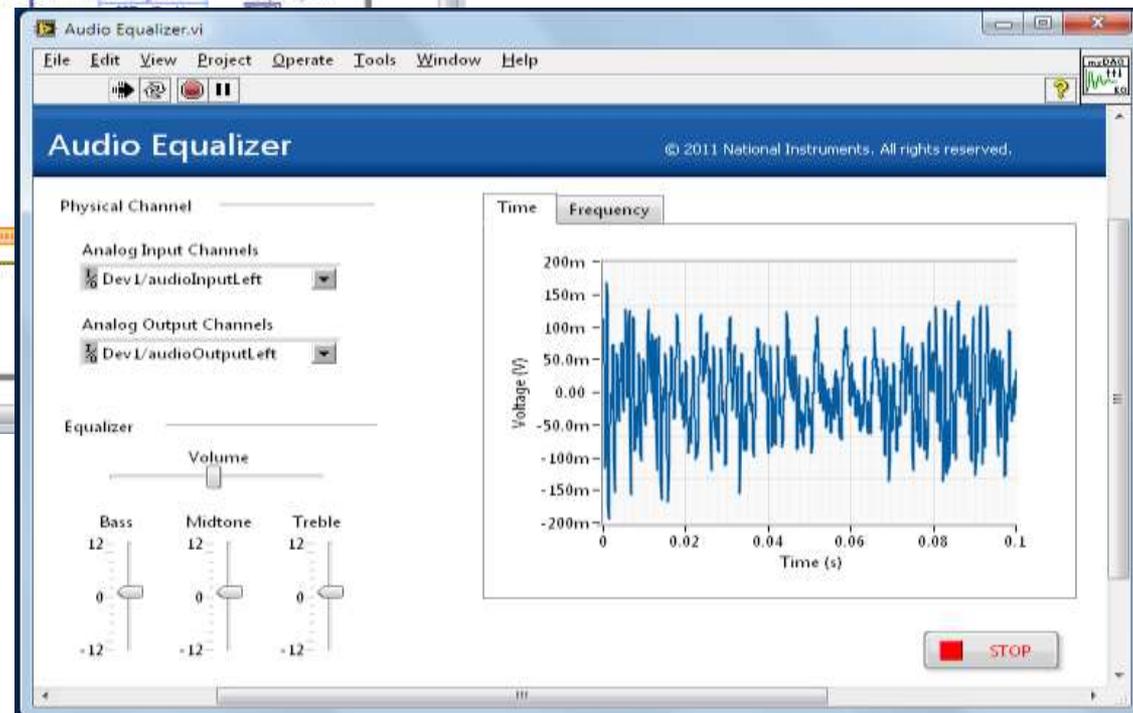
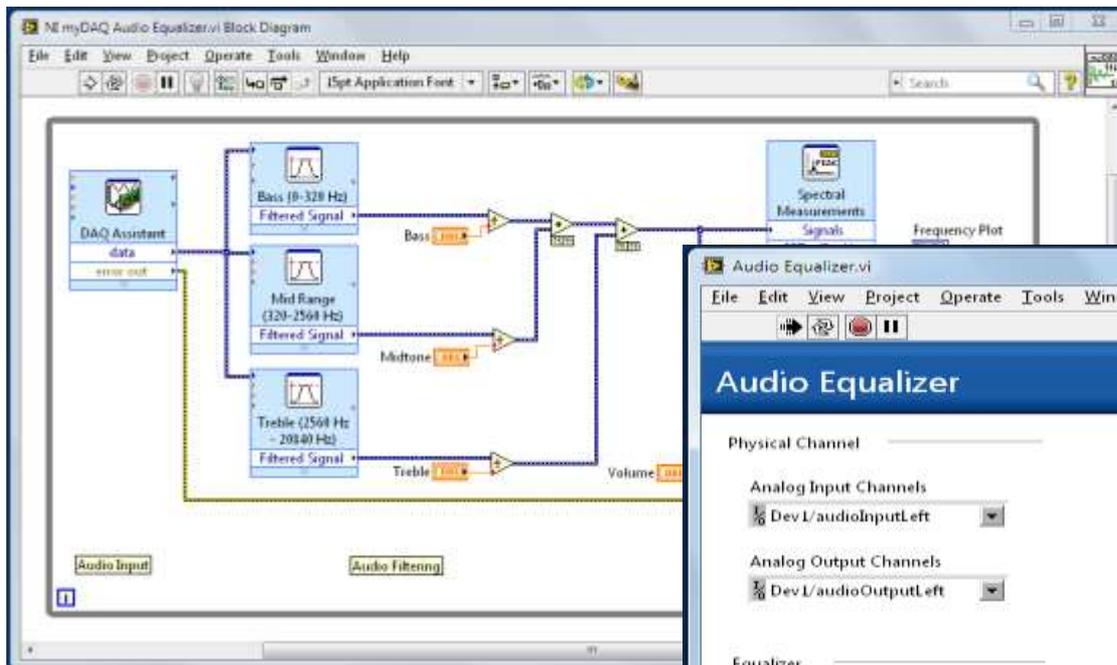
Student Design from Virginia Tech

Road Ready Vehicle for Blind
Non-visual driving interfaces
FPGA Parallel Processing
Potential Field Algorithms

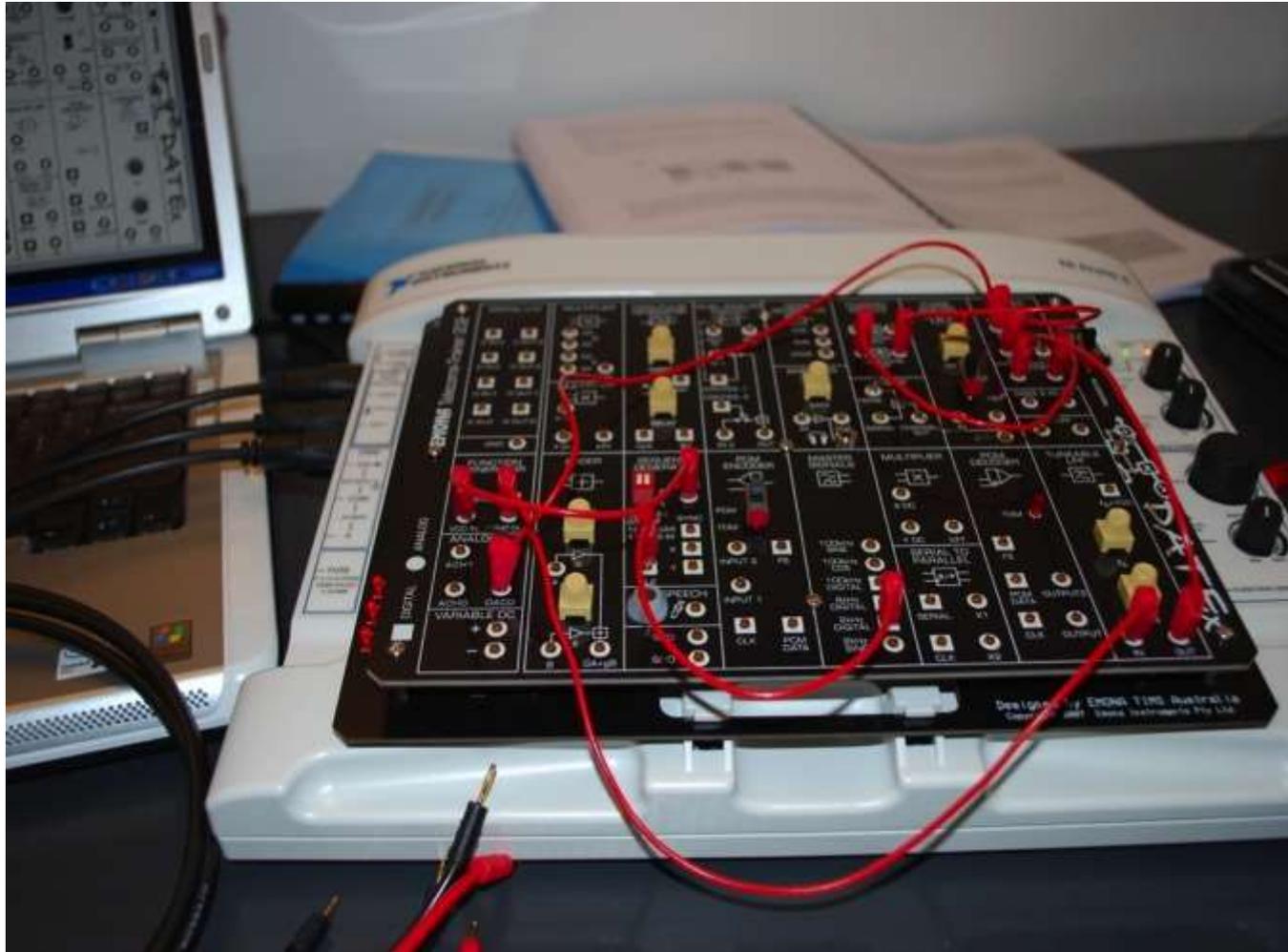


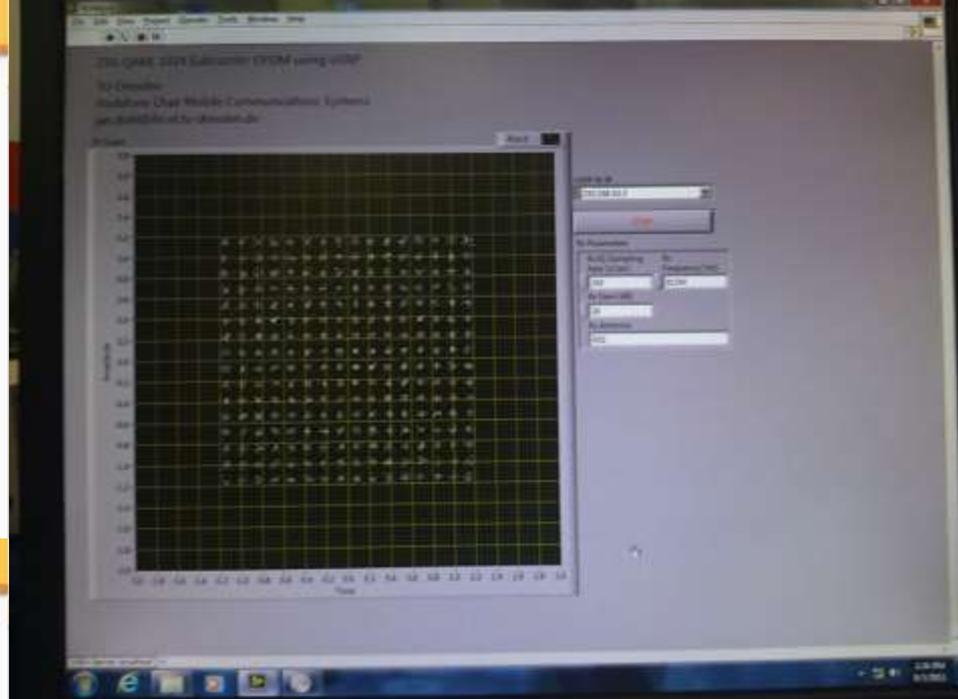
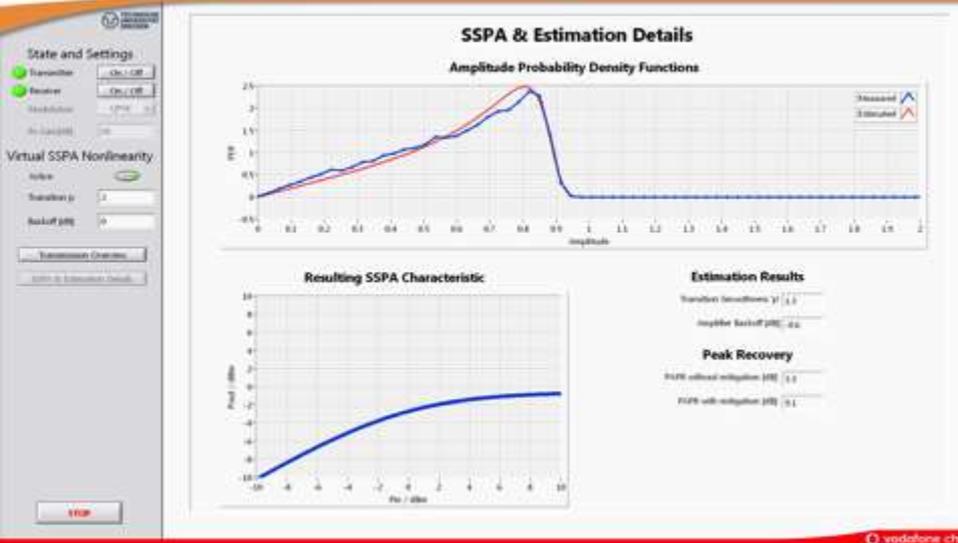
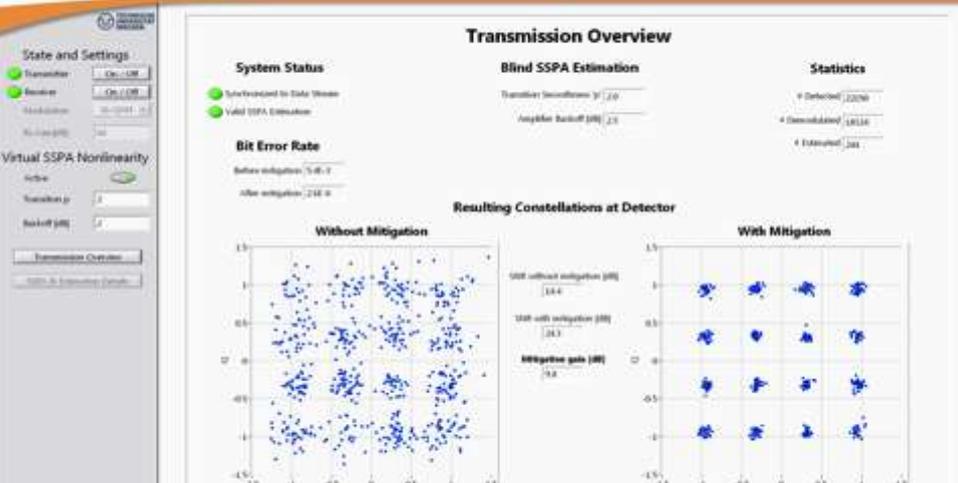
Communications

Outreach: Audio Equalizer with NI myDAQ



Retention: Telecommunications Fundamentals with NI ELVIS and Emona DATEx





Graduation Learning “Dirty” RF
 Cleanly
 TU Dresden, Germany

Next Generation RF Technologies
 256 QAM OFDM, 1024 subcarriers
 LabVIEW & USRP Based
 Intensely Parallel Programming

Answering the Engineering and Engineering Technology Education Challenges



Outreach



Retention



Graduation

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Receive one-on-one consulting with NI engineers to learn how to incorporate solutions into your course.

Circuits and Electronics <http://bit.ly/ni-hitec> Three-Part, On-Demand Webcast Series

NI Academic Program ni.com/academic

Teaching solutions, training resources, and course material

Do Engineering



AUDIO & VIDEO

NetWorks Admin

Talk Video

PARTICIPANTS

NetWorks A...
Moderator

MAIN ROOM (3)

NetWorks Admin
Moderator (You)

CHAT - Supervised

Room Moderators

New Page Delete Page Fit Page Public Page 1

? **FINAL QUESTIONS**

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<http://questionpro.com/t/ABkVkZQOAJ>

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Keyword Search:

“Top Educators’ Secrets”

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Professional Growth at www.matecnetworks.org

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of this webinar and would like
a certificate of participation, please email

janet.pinhorn@domail.maricopa.edu

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July 21-24, 2014



www.highimpact-tec.org

A decorative horizontal arrow graphic pointing to the left, with a light beige body and an orange-to-yellow gradient arrowhead on the right side.

Thank You!

Thank you for attending the
MATEC NetWorks Webinar

Top Educators' Secrets

A solid orange horizontal bar at the bottom of the slide.