

Preparing a Generation of Lifelong Learners



Andy Bell

Director of Innovation
National Instruments



OPERATIONS IN
50+ COUNTRIES

\$1.36

BILLION
IN 2018



35,000+
CUSTOMERS WORLDWIDE

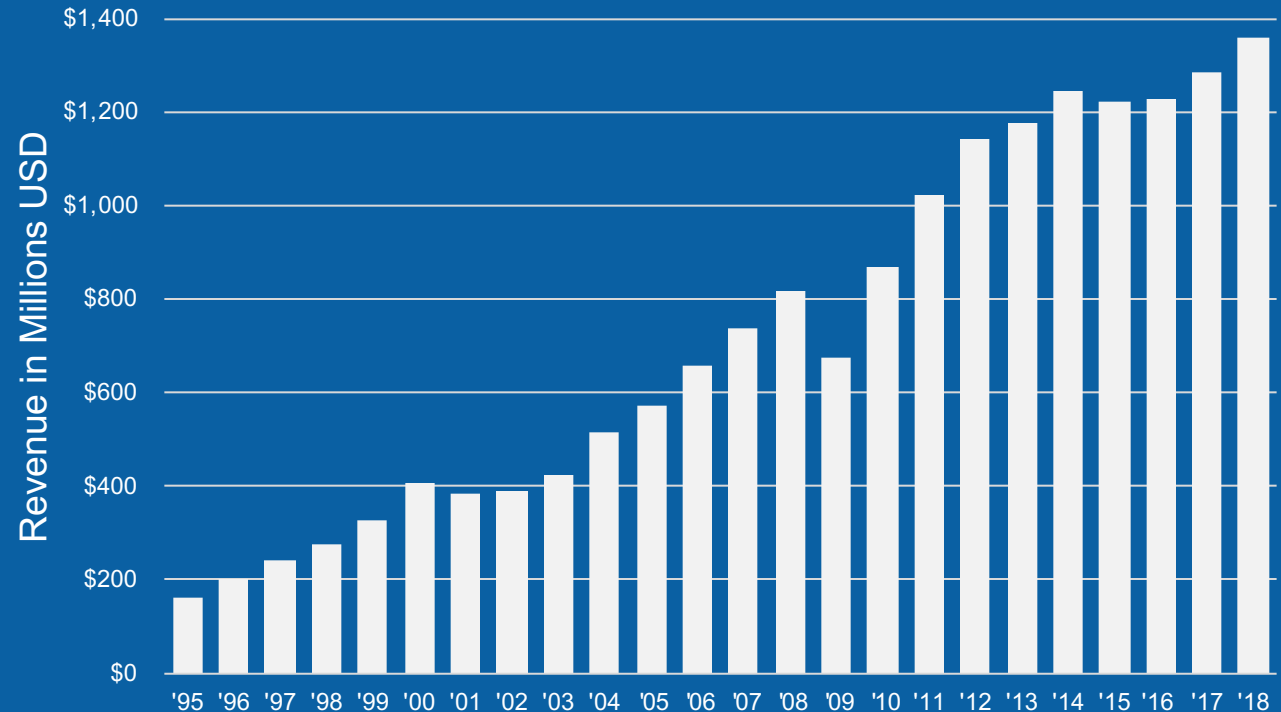


18%
INVESTMENT IN R&D

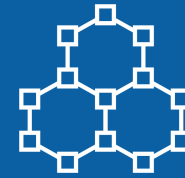


MISSION STATEMENT

NI equips engineers and scientists with systems that accelerate productivity, innovation, and discovery.



Our Engineering World Is Rapidly Changing



INCREASING
COMPLEXITY



COMPRESSED
DEVELOPMENT
TIMES



SMALLER
TEAMS



Big Physics



Clean Energy



5G



IOT



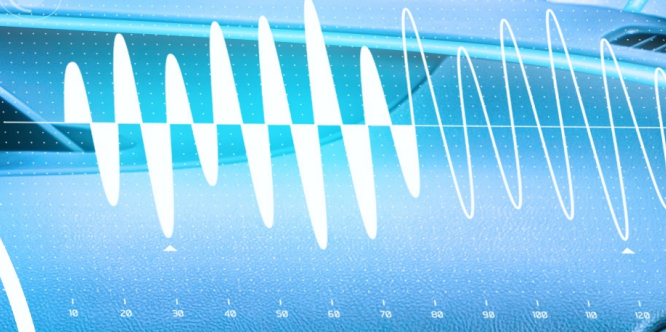
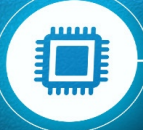
Driverless Cars

Self-Driving



48
mph

← 100m

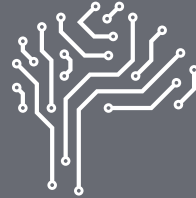




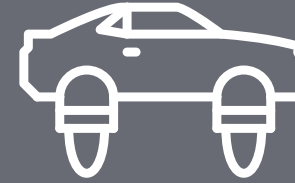
Sensing
Technology



Communications
Standards



Artificial
Intelligence



Advanced
Control Systems

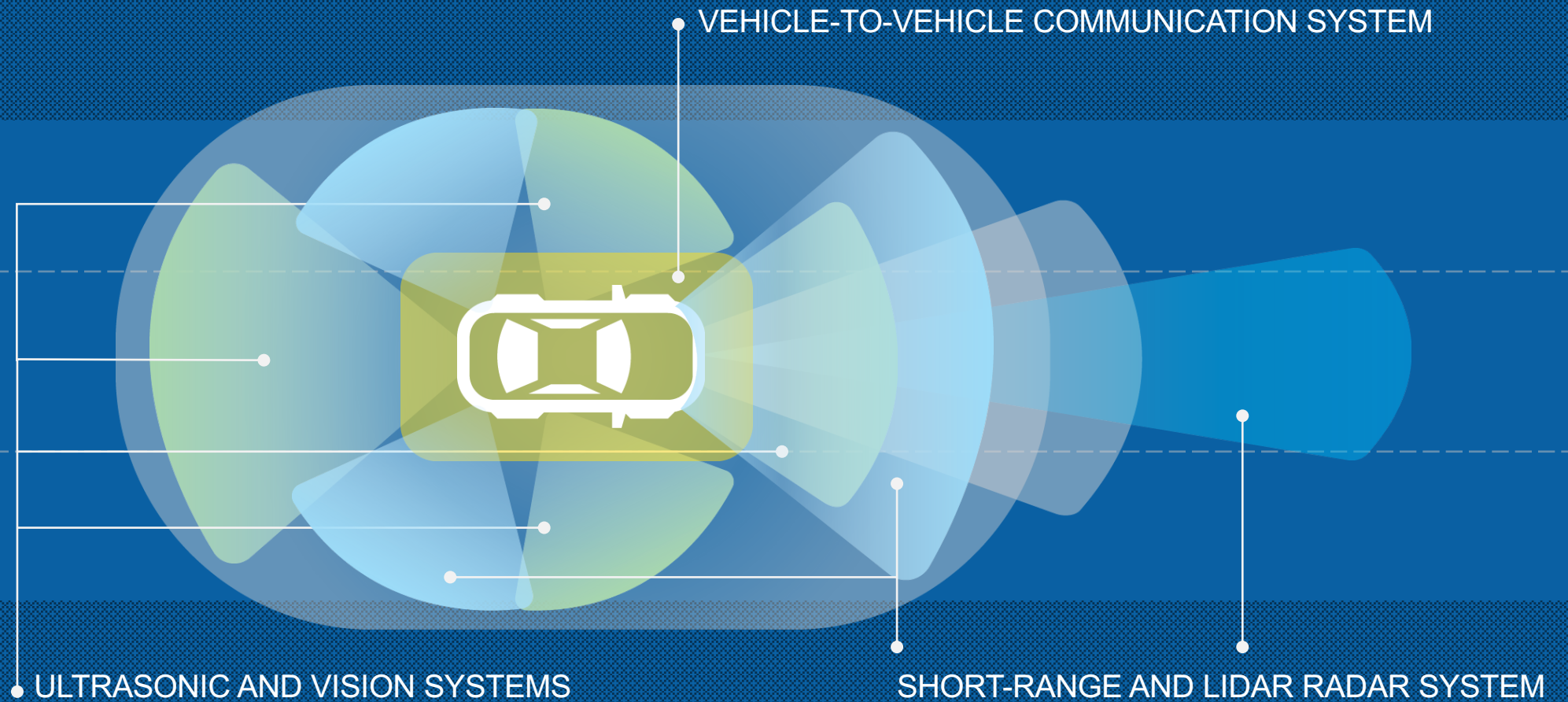


Power
Electronics



Engineering System Design

Autonomous Vehicle



Engineering Education Paradigms

National Academy of Sciences

Engineering Practice

design according to codes and well-defined procedures; limited use of mathematics; many faculty with industrial experience and/or strong ties with industry

Project Based Learning

teamwork, communication, integration, design, manufacturing, continuous improvement; maintain analytic strength



Engineering Science

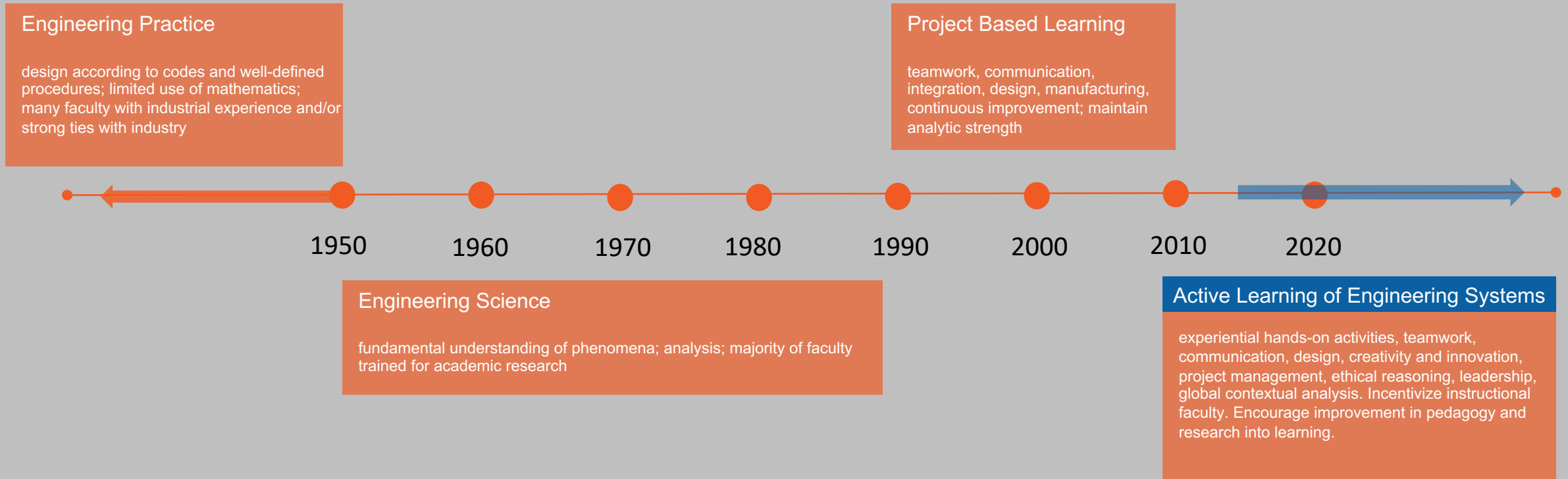
fundamental understanding of phenomena; analysis; majority of faculty trained for academic research

Active Learning

experiential hands-on activities, teamwork, communication, design, creativity and innovation, project management, ethical reasoning, leadership, global contextual analysis. Incentivize instructional faculty. Encourage improvement in pedagogy and research into learning.

Engineering System Design

Evolving the Paradigm Shift to Change Engineering Education



Skills that Companies Need for Graduating Students

- Good Communication Skills
- **Understanding of Engineering Fundamentals**
- Ability to Problem Solve
- **Critical Thinking**
- Ability to Prioritize
- **Teamwork Skills & Ability to Function in Multidisciplinary Teams**
- **Ability to Apply Engineering Knowledge**
- Data Interpretation and Visualization
- Leadership
- Creativity
- Systems Thinking
- Flexibility and Ability to Adapt
- Innovation
- Understanding of Design
- **Ability to Deal with Complex Problems**

Teach Students to Innovate



Students need to learn **teamwork** while **solving complex, multidisciplinary problems**

Transforming Undergraduate Education
in Engineering by ASEE



Engage and retain students by building experiences **with real engineering design problems.**

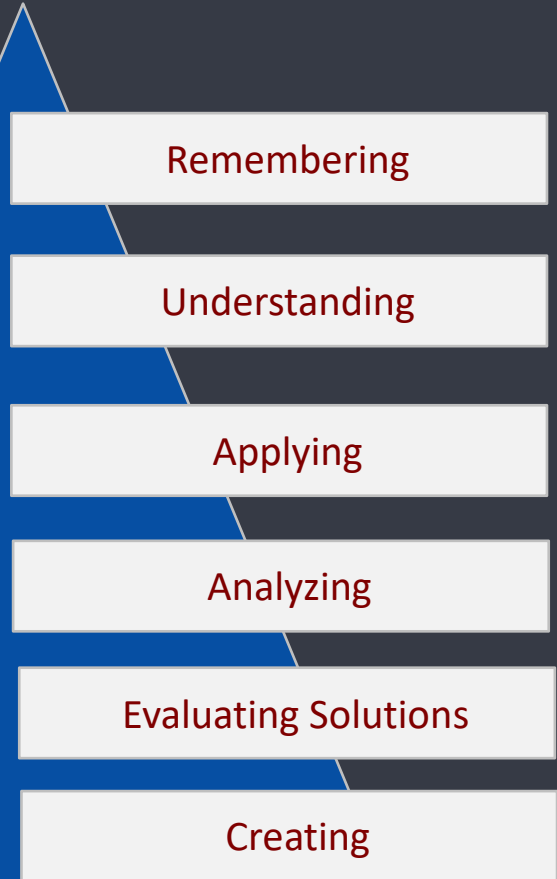
Educating the Engineer of 2020
National Academy of Engineering



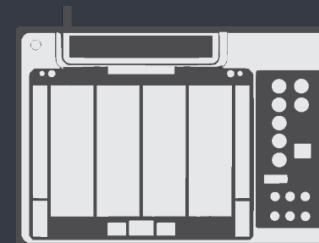
Students must work on multidisciplinary teams using **modern engineering tools**

Criteria for Accrediting Engineering Programs
Washington Accord (of Accreditation)

Bloom Theory of Learning



Traditional lab solutions

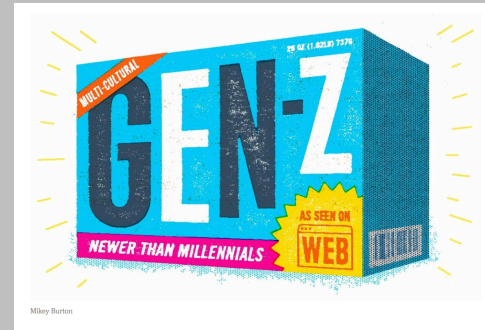


Modern Teaching Laboratory Solutions

Build a Systems Approach into Foundational Areas



Adapt Teaching Approach to the Generation



Drive Innovation with Interdisciplinary Teamwork



Build Academic and Industry Partners with Impactful Stakeholders



Focus on PBL to Meet Educational & Industry Ready Outcomes

