LabVIEW

what is it, why use it?

Odd Andreassen & Adriaan Rijllart
EN-STI-ECE
How we got to use LabVIEW?

10,000 LHC magnets to test

What type of tests?
• Quench limit
• Quench heater performance
• Magnetic main field + harmonics
• Electrical insolation
• Protection diode
• Splice resistance
• Beam screen cooling
• Cryostat heat leak
• ...

20 different systems needed
How could we do it, fast and with few?

• How much time did we have?
  • 4 years, before magnets would start flooding in

• How many were we in the team?
  • 2 engineers
  • 3 technicians
  • 2 students

We were not so confident (panic!!)
We needed a miracle tool

Something that could translate our block diagrams into working systems!
A graphical, dataflow-based programming language for parallel data acquisition and control systems.
LabVIEW block diagram and GUI

Block diagram

Drag and drop GUI

Easy to learn, easy to do = fast development!
Comparison with text based languages

```c
for (i = 0; i < 10; i++)
{
    if(check(i)) break;
}

int x = 0;
String y;
while (x < 5)
{
    y = functionCall(x);
    printf(y);
    x++;
}
```

The graphics helps understanding
All systems ready in time!

for the 10’00 magnets to be tested

Ouuff, we made it!
LabVIEW got popular …

... but something went wrong

Spaghetti code was produced a lot (and it’s a mess!!)
Coding standards, training, certification

Templates

Training

Certification

Structure your code, get certified!
LabVIEW real-time and FPGA makes coding embedded systems easy
Renewed interest from students

LabVIEW evening workshops @ CERN in 2016

- No previous knowledge req.
- Tutor was a student
- Teaching for fun

- 6 evenings in IdeaSquare
- 18:00 to 20:00
- Certification exam at the end for the brave ...

150 students signed up!
Join us for the next session

LabVIEW evening workshops will restart in April 2017!

- New tutor
- Same building: 3179
- Renewed fun

Join us and spread the word!
Thank you for your attention!