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MENA

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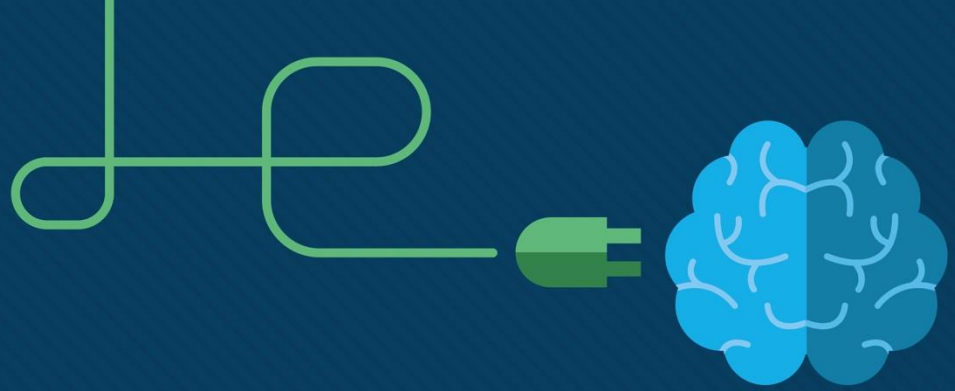
LATAM

Serges Nanfack
Sub-Sahara

Ananth
B Shankar Rao
APAC/Japan

Gabriela Neira,
Associate

Networking Academy



From Sensor to Sense

PL-App Demo

Eugene Morozov

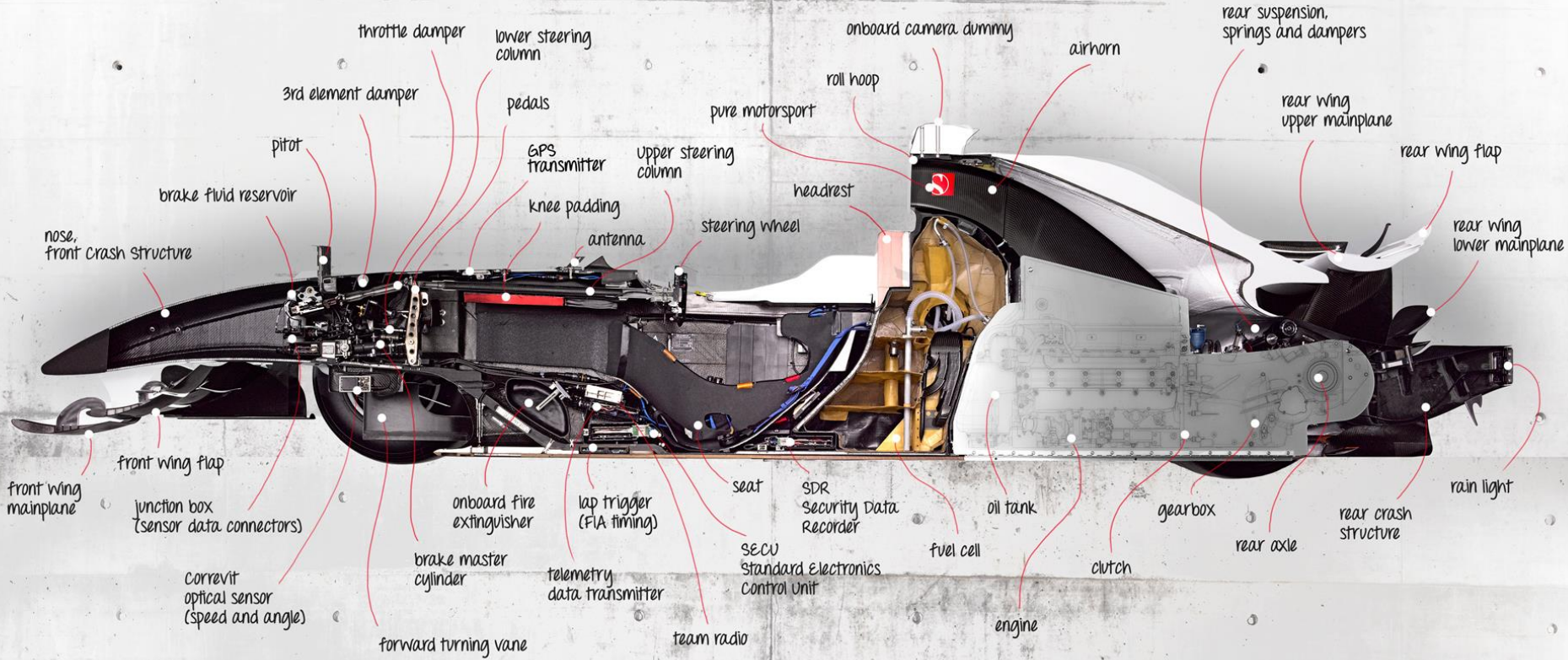
Technical Manager CEE-RCIS, N&B

20 April 2018
Fulda

#NetAcadIPD


5
KASPERSKY
MAHLE

Sauber F1 Team



Collecting the data

IoT Fundamentals: Connecting Things

Course Overview

Students learn how to securely interconnect sensors, actuators, microcontrollers, single-board computers, and cloud services over IP networks to create an end-to-end IoT system.

Benefits

Students will develop multi-disciplinary skillsets required to prototype an IoT solution for a specific business case with a strong focus on the security considerations for emerging technologies.

Learning Components

- Understand and explain the concepts, opportunities and challenges of digital transformation using IoT.
- Interconnect sensors/actuators, microcontrollers (Arduino), Single Board Computers (Raspberry Pi) and cloud services (Cisco Spark restful API) to create an end-to-end IoT system.
- Understand the relevant aspects of cybersecurity and privacy for an IoT solution.
- Understand how digitalization is changing vertical markets such as manufacturing, energy, and smart cars.
- Use simulation tools (Packet Tracer) to create end-to-end IoT system.

Features

Target Audience: Secondary, Vocational, 2-year and 4-year College, 4-Year University students

Prerequisites: Basic programming, networking and electronics

Languages: English

Course Delivery: Instructor-led

Estimated Time to Complete: 40-50 hours

Recommended Next Course: IoT Fundamentals: Big Data & Analytics or Hackathon Playbook

Instructor Training: Required

Cisco Prototyping Lab

Tool Overview

The Cisco Prototyping Lab is a comprehensive learning environment created by Cisco for Networking Academy students to learn and practice key aspects of the foundational IoT technologies. Using an engaging, hands-on approach, it supports both the learning and creative phases of the Networking Fundamentals curriculum.

Career Prep

Provides an easy to use, comprehensive learning environment using real devices, code, coding tools and data that students use to create the physical interconnection of an end-to-end IoT and the logical data pipeline to acquire, analyze and present data.

Learning Components

- Prototyping Lab App
- Prototyping Lab Kit
  - Raspberry Pi 3 CanaKit Ultimate Starter Kit (or equivalent)
  - SparkFun Inventor's Kit for Arduino v3.2 (or equivalent)
  - Cables, sensors & actuators

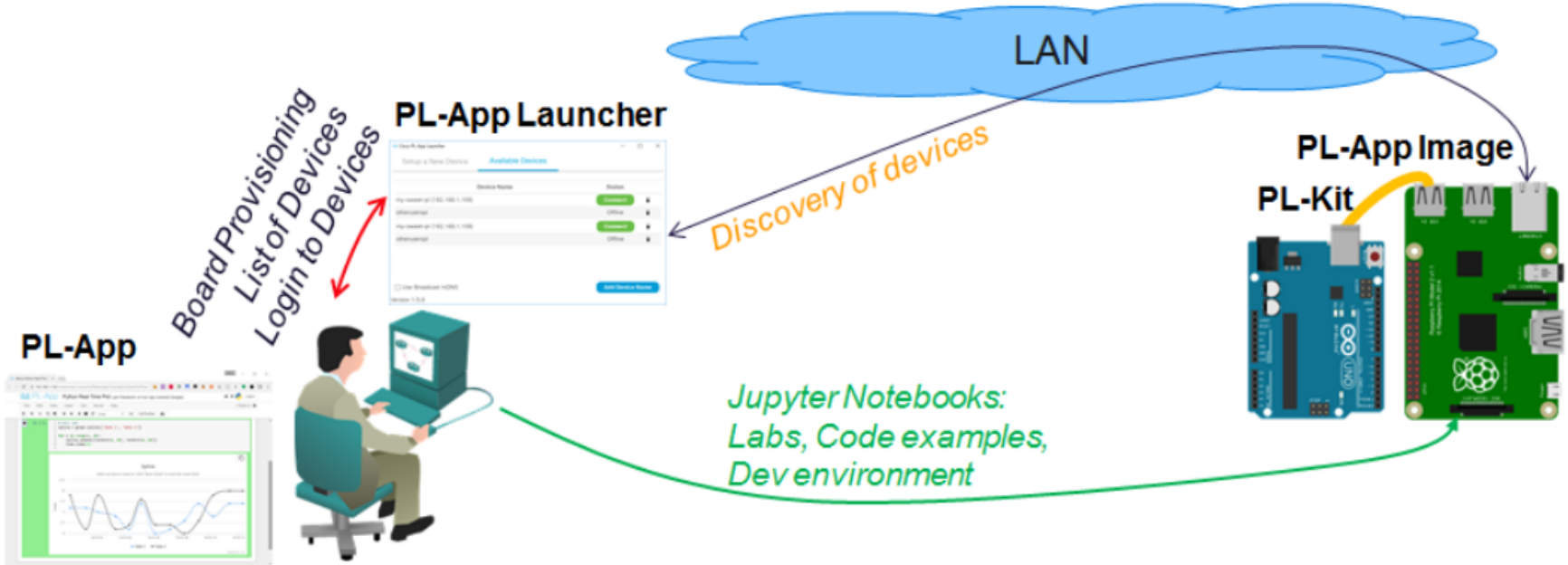
Features

As an integral part of the Networking Academy learning experience, Cisco Prototyping Lab provides

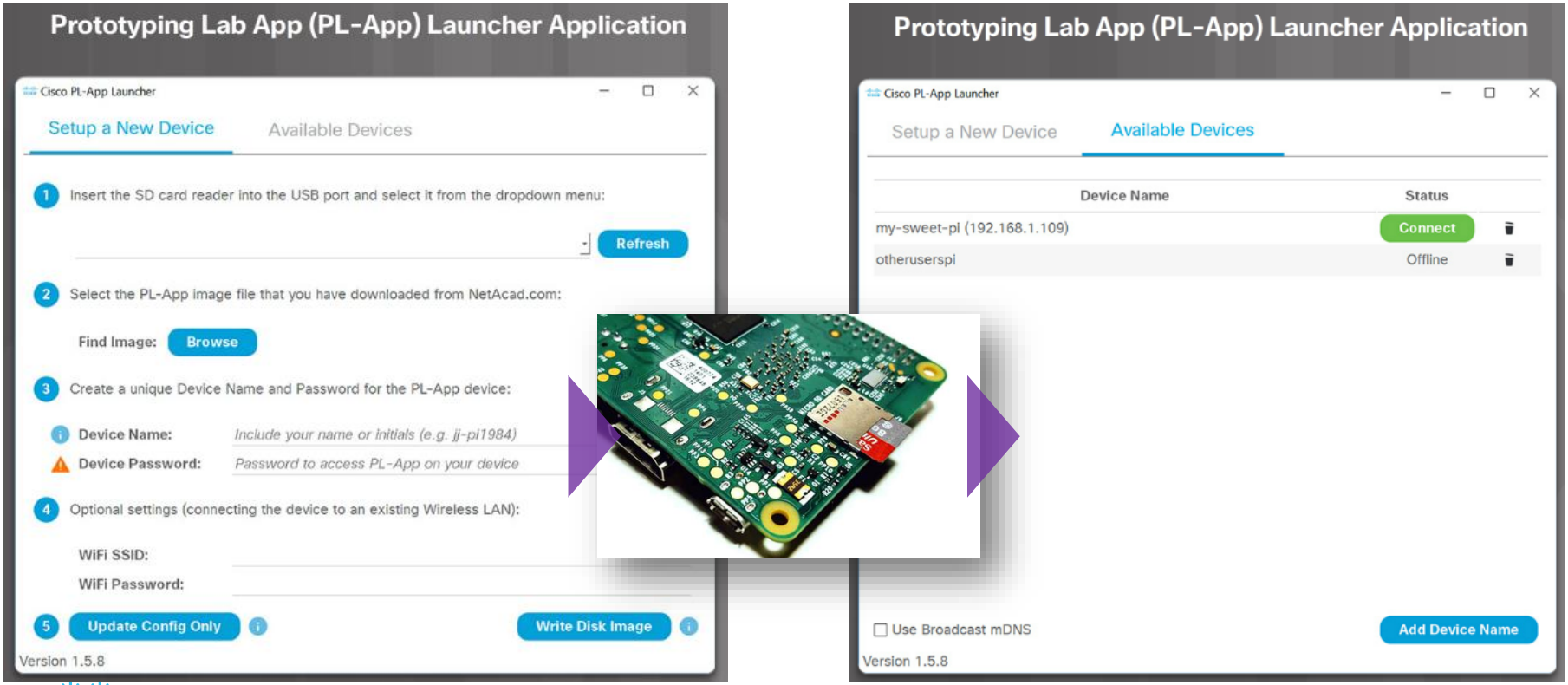
- Interactive labs using Jupyter Notebook
- Visual programming with Blockly
- Device programming with Python
- Data visualization & analytics
- Connected applications via APIs
- Rapid Prototyping

Prototyping Lab App

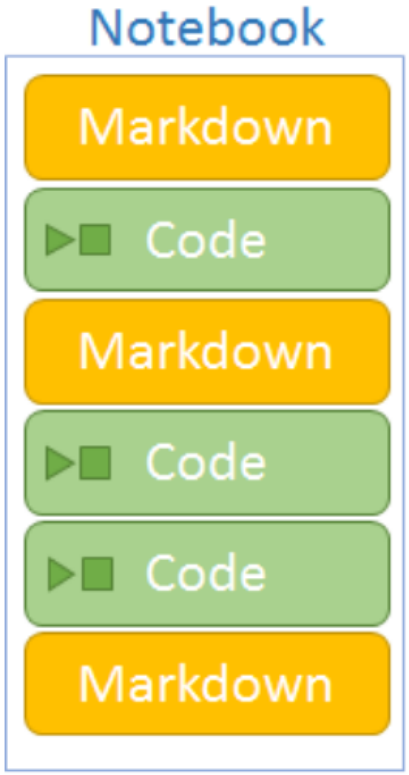
- Standard tool used in IoT Fundamentals courses



PL-App Launcher

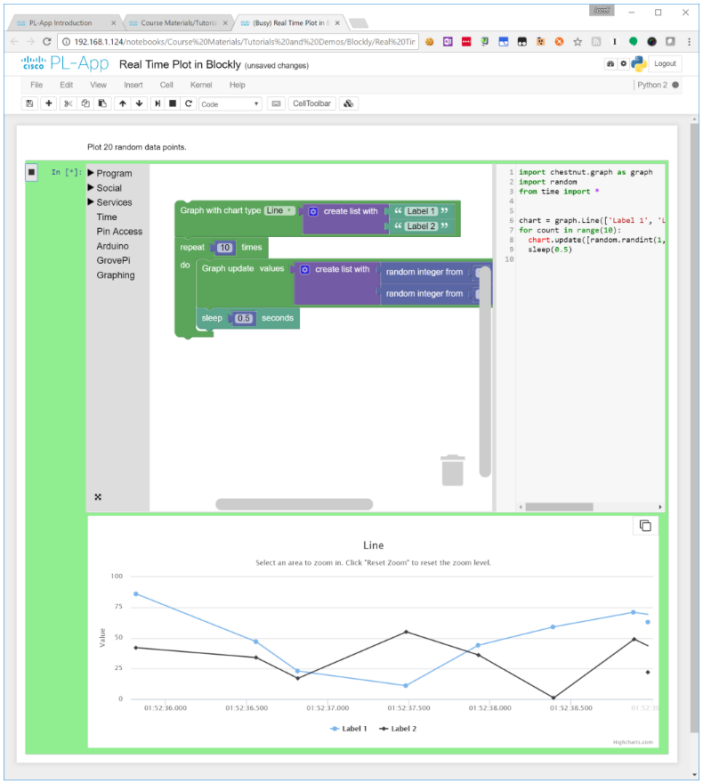


PL-App Notebooks

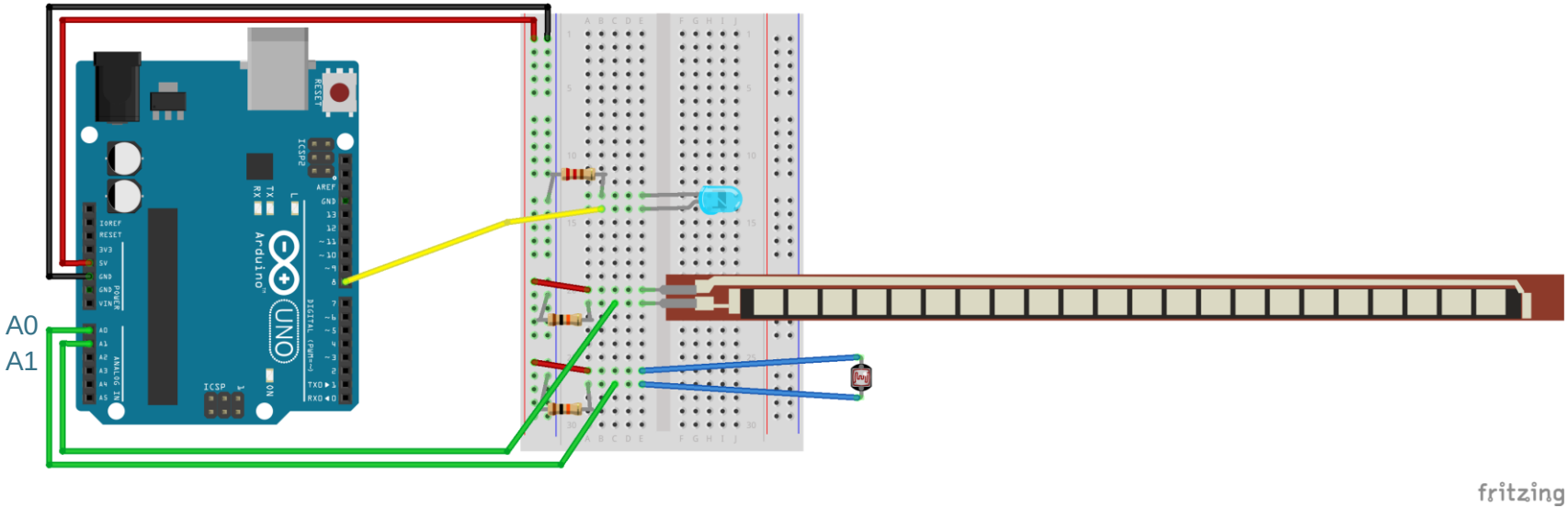


Combines:

- Explanatory text, graphics, media
- Programming code in Python, Bash or Blockly
- Data visualization



Circuit



Code

- Infinite loop
- Variables:
  - time
  - vibration
  - light
- Time = seconds from start
- Vibration = read from pin Analog 1
- Light = read from pin Analog 0
- Write to CSV file

CT 5.1.1.3 Connecting and Digitizing Industry
BDA 1.2.1.3 intelligent devices in cars can be used to facilitate day-to-day activities
BDA 1.3.1.1 challenges of Big Data

“The network will play a crucial part in how we develop the car; gathering data, learning from it and adapting will ultimately determine our season.”

Christian Horner
Team Principal, Infiniti Red Bull Racing

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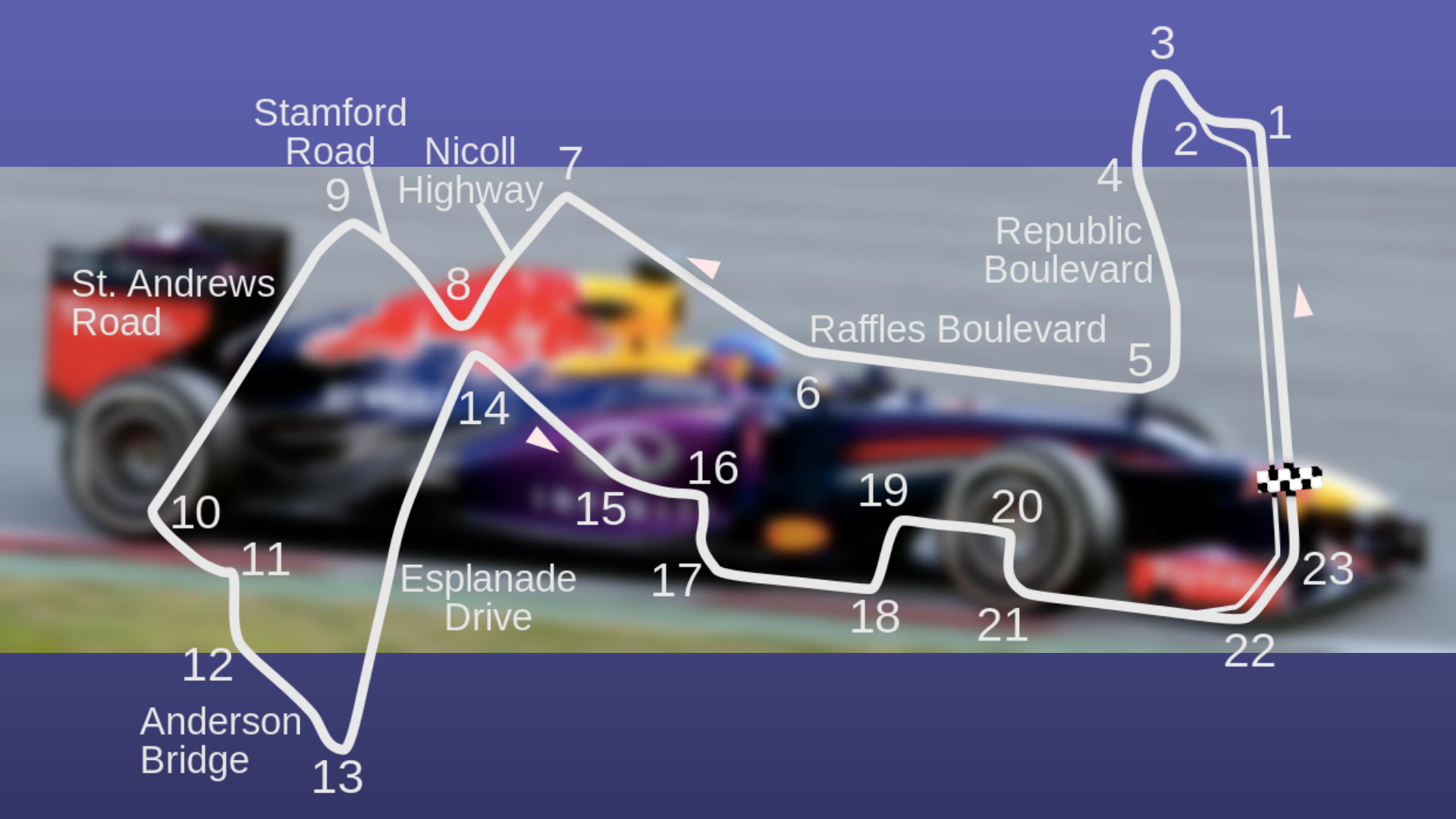
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4
Republic
Boulevard
St. Andrews
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Raffles Boulevard
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19
20
11
Esplanade
Drive
17
23
18
21
12
22
Anderson
Bridge
13

Analyzing the data

IoT Fundamentals: Big Data & Analytics

Course Overview

Students will learn how to use Python data libraries to create a pipeline to acquire, transform and visualize data collected from IoT sensors and machines.

Benefits

The transformative element of any IoT system is the data that can be collected from it. Thus the ability to extract data and using data analytics techniques to gain insights increases employability.

Learning Components

- Use Python to read data from sensors and store data in a SQL data base.
- Use Python Data Analysis library to clean, manipulate, integrate data sets.
- Use Python Visualization Libraries to visualize real-time data end explore acquired data sets.
- Explain the fundamental principles of a modern scalable Big Data platforms like Hadoop.
- Use storytelling to present the insights gained from extracted data.

Features

Target Audience: Secondary, Vocational, 2-year and 4-year College, 4-Year University students

Prerequisites: IoT Fundamentals: Connecting Things

Languages: English

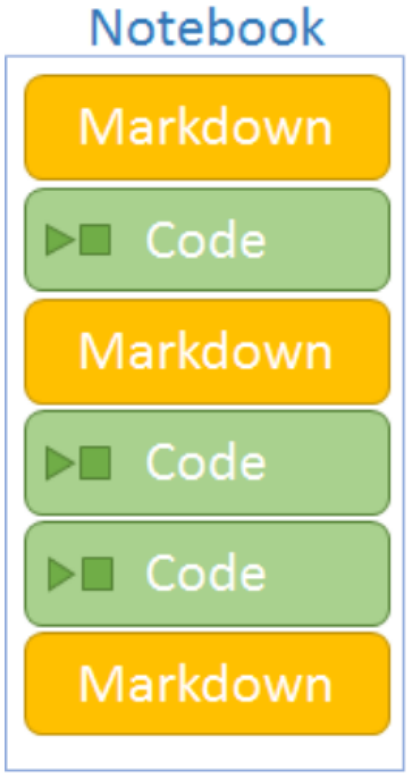
Course Delivery: Instructor-led

Estimated Time to Complete: 40-50 hours

Recommended Next Course: IoT Fundamentals: Hackathon Playbook

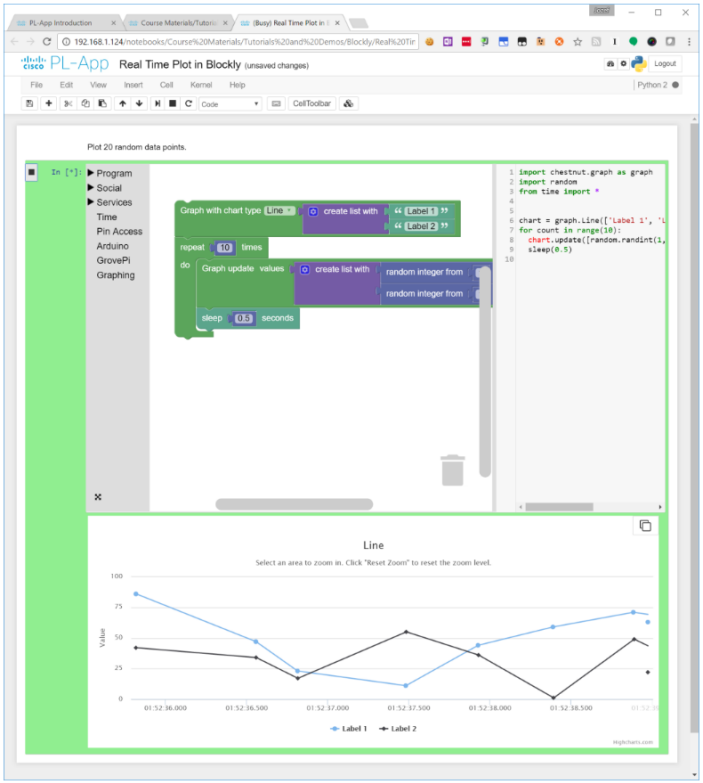
Instructor Training: Required

PL-App Notebooks



Combines:

- Explanatory text, graphics, media
- Programming code in Python, Bash or Blockly
- Data visualization



IoT Fundamentals Course Summary

	Course Overview	Benefits	
Connecting Things	Students learn how to securely interconnect sensors, actuators, microcontrollers, single-board computers, and cloud services over IP networks to create an end-to-end IoT system.	Students will develop multi-disciplinary skillsets required to prototype an IoT solution for a specific business case with a strong focus on the security considerations for emerging technologies.	Course Delivery: Instructor-led Estimated Time to Complete: 40-50 hours
Big Data & Analytics	Students will learn how to use Python data libraries to create a pipeline to acquire, transform and visualize data collected from IoT sensors and machines.	The transformative element of any IoT system is the data that can be collected from it. Thus the ability to extract data and using data analytics techniques to gain insights increases employability.	Course Delivery: Instructor-led Estimated Time to Complete: 40-50 hours
Hackathon Playbook	The Hackathon Playbook is a comprehensive framework of tools and templates to prepare and run a Hackathon as a result of best practices and lessons-learned collected from the global execution of IoT Hackathons within Networking Academy and by other organizers.	Student reinforce and deepen their multidisciplinary IoT and data skills by defining, designing, prototyping and presenting an IoT solution to a panel of industry experts and peers.	Course Delivery: Instructor-led Estimated Time to Complete: 20-30 hours

A New NetAcad Hands-On Experience

IoT Fundamentals | Lab Experiences

Analyze the Problem with User Focus

Hands-on Design and Maker Mindset

Rapid Prototyping, Iterating, Presenting


CISCO