What’s new in MATLAB and Simulink for Academia?
Focal Points

- There is much more to MathWorks than just MATLAB
- Upgrading to the latest release is worth it
- Try MATLAB Mobile today
Motivation

- There is much more to MathWorks than just MATLAB
  - It is hard to keep up with the MathWorks

- Upgrading to the latest release is worth it
  - There are lots of new things in every product

- Try MATLAB Mobile today
  - It is fun!
Introduction to the Speaker

Gareth Thomas

- Masters in Electronic Engineering at Instituto Superior Técnico
  Control Theory and Signal Processing
- Consultant at Altran CIS in Portugal
- Innovation Officer at Nokia Siemens Networks in Portugal
- Software Engineer at Oceanscan in Scotland
- Senior Application Engineer at Mathworks Benelux
- WW Academic Marketing Manager at Mathworks
Rule #1
If you say something you win a prize!
Which is the Latest Release?
Who has Installed R2016a?
Well Done!
When did it come out?
3rd of March
How many Products does MathWorks have?
How many new Features are in MATLAB?
And Simulink?
How do you find out what is new?
Read the Release Notes!
(or come to an Expo)
So what is important for Academia?
Check out R2016a at a Glance:

MATLAB Anywhere

*Integrated Experience for Online, Mobile, PC, Clusters & Cloud*

MATLAB ON
- PCs
- Clusters
- Cloud

CONNECTED TO
- Data Sources
- Data Warehouses

SUPPORTING
- Hardware & Sensors

MathWorks Cloud
- File Storage & Sync
- Preferences
- Licensing
- Compute (MSS)
- H/W Connectivity

MATLAB Online

MATLAB Mobile
What happened in R2016a?

- Live Editor
- New SimEvents!
- Matalab Academy
- Matalab Mobile
- ThingSpeak!
- Matalab Online
- Cody Add-on Explorer
- Cody Coursework
- New Resources
- Matalab Drive
Connecting the dots...
What about before R2016a?
#1 Live Editor ... with LaTeX

*Understanding and writing equations is a fundamental part of learning!*
#2 New SimEvents

*Simulink is not only continuous and discrete but also event driven!*

- **Event Actions**
  Modify entity attributes, service, and routes on events such as entity generation, entry, and exit

- **MATLAB Discrete Event System Block**
  Author custom SimEvents blocks using MATLAB

- **Discrete Event Chart**
  Create Stateflow state transition diagrams that process entities, react to entity events, and follow precise timing for temporal operations

- **Entity Multicast**
  Wirelessly broadcast copies of entities to multiple receive queues

- **Domain Transitions**
  Automatically switch between time-based and event-based signals

- **Simulink Integration**
  Use Simulink features, such as Fast Restart to speed up simulation runs and Simulation Stepper to debug
#3 Cody

Learning has to be fun for everyone!

MATLAB Speaks Hardware
Use Arduino, Raspberry Pi, and LEGO MINDSTORMS without writing code

MATLAB EXPO 2016 BENELUX
28 June | Eindhoven, The Netherlands
#4 MATLAB Online

No installation needed!

MATLAB Speaks Big Data
Be your own data scientist – use MATLAB with Hadoop and MapReduce

MATLAB EXPO 2016 BENELUX
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#5 MATLAB Mobile

*Tablet and phone based MATLAB experience*

1. Connect to Laptop
2. Connect to Cloud
3. Stream Sensor Data to Laptop
4. Stream Sensor Data to Cloud
#6 ThingSpeak

Stepping stone for IoT solution

![Diagram of IoT solution process]

- **Data Aggregator**
  - Online analytics
  - Visualization and reporting

- **Edge Nodes**
  - Local embedded algorithms
  - Data reduction

- **Communication**
- **Connectivity**
  - Deploy analytics to aggregator
  - Deploy algorithm to device

- **Exploratory Analysis**
  - Historical analytics
  - Algorithm development
#7 MATLAB Drive

Synchronize your MATLAB Files across MATLAB Devices

With MATLAB Drive and MathWorks cloud storage...

...use the files with MATLAB Mobile...

...on a computer with MATLAB Drive connector installed...

...Share with your peers...

Upload files to the MathWorks cloud.

and from MATLAB Online.
#8 MATLAB Academy

Learning MATLAB

Accelerate Model Setup and Simulation in Simulink
Use the new automatic solver option and start page

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#9 Cody Coursework

**Teaching MATLAB**

Cody Coursework™

and the sum of all the numbers
the input vector x.

```matlab
x = 1:100;
correct = 5050;
assert(isequal(sum(x), y_correct))
```

Output x = [42, -1]

Output y is 41

Cody Coursework Catalog

Popular Courses

- **Cody Problems**
  by MathWorks
  The following set of challenges are problem groups from Cody on MATLAB Central: Cody Challenge. This challenge includes 90+ interesting problems suitable for teaching introductory MATLAB programming concepts. Problems Include-Matrix
  
<table>
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- **Introduction to Programming**
  by MathWorks
  Introduction to Programming!
  This course is a collection of problems to help you learn both programming and the MATLAB data types. To get started learning MATLAB visit MATLAB academy. Additional reference material is linked with each.
  
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- **Differential Equations using MATLAB**
  by MathWorks
  Learn how to solve Ordinary Differential Equations in MATLAB.
  
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- **Optimization and Curve Fitting**
  by MathWorks
  Learn how to perform optimization routines and fit datasets using MATLAB.
  
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#10 Endless MATLAB Resources
#11 Add-on Explorer

Leveraging the community empowers you even more!

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MathWorks Toolboxes and Products

- **Statistics and Machine Learning Toolbox**
  - Analyze and model data using statistics and machine learning

- **Computer Vision System Toolbox**
  - Design and simulate computer vision and video processing systems

- **Robotics System Toolbox**
  - Design and test algorithms for robotics applications

Community Toolboxes

- **Deep Neural Network**
- **JSONlab: a toolbox to**
- **GUI Layout Toolbox**
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