

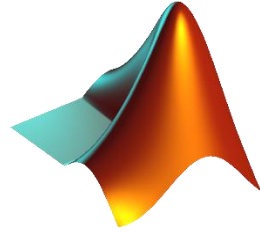
# MATLAB Technologies for University of Novi Sad, Teaching and Research in the Campus



Caner Dogan  
Customer Success Specialist



# Your MathWorks Team



- Installation Support - **Dany Desjardins**, [emea-install@mathworks.com](mailto:emea-install@mathworks.com) / [Support page](#)



- Customer Success Specialist - **Caner Dogan**, [cdogan@mathworks.com](mailto:cdogan@mathworks.com)

# Agenda

- MATLAB Campus-Wide License overview
- Resources for Teaching
- MATLAB portal for Individual Use
- License Installation and Management
- Awareness Materials
- Recent Events
- Q&A

**Headquarters**  
Natick, MA USA

**North America**  
United States



**Europe**

- France
- Germany
- Ireland
- Italy
- Netherlands
- Spain
- Sweden
- Switzerland
- UK

**Asia-Pacific**

- Australia
- China
- India
- Japan
- Korea



**6 million+ users**

in more than 185 countries



**6000+ staff**

in 31 offices around the world



**\$1+ billion**

in 2017 revenues with 60% from outside the US



**Privately held**

and profitable every year

# EMEA Distributors Team



**Marco Rossi**  
Customer Success  
Turin



**Yona Baskharoun**  
Sales Lead  
Eindhoven



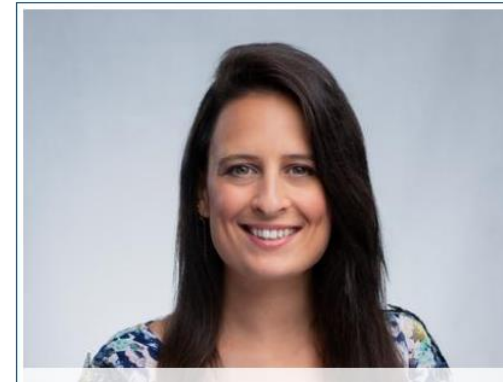
**Caner Dogan**  
Customer Success  
Galway



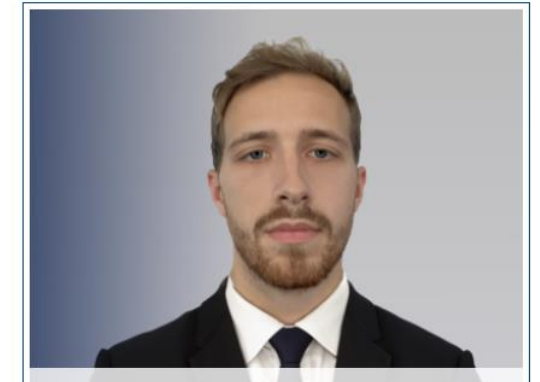
**Janos Kertesz**  
Sales Manager



**Akos Koppany Kiss**  
Customer Success



**Klara Kiss**  
Customer Success



**Roland Sebestyen**  
Sales Representative

# Campus-Wide License



# CAMPUS WIDE LICENSE

More than **6.2 million students** and over **2,100 universities** around the world — including the top 30 ranked universities — have unlimited access to MATLAB and Simulink with a Campus-Wide License.

## JOB OPPORTUNITIES

 **82%**

Fortune 100 companies with a MATLAB license

“*If you want to work at Google, make sure you can use MATLAB*”

**Jonathan Rosenberg**

Senior Vice President of Products

Google



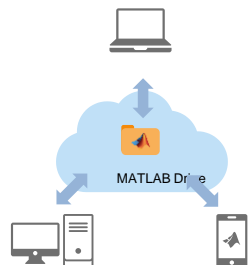
# Campus-Wide License Overview



University & lab computers

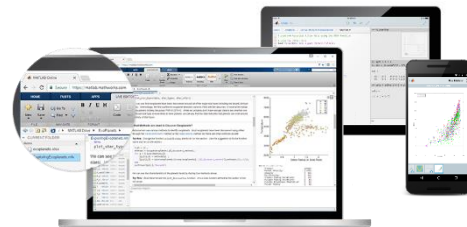


Online access

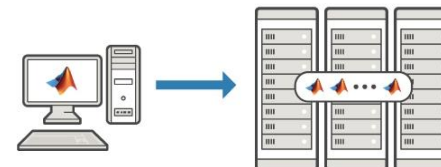


Cloud storage & sharing

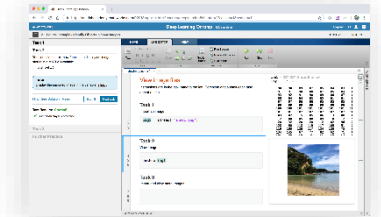
- ✓ Annual license
- ✓ Access to all MATLAB and Simulink products available for academic use (100+ toolboxes)
- ✓ Access to MATLAB Grader
- ✓ Access to self-paced online courses
- ✓ Covers all faculty, staff, students and their devices
- ✓ Access anywhere, any time, on- or off-network
- ✓ Immediate tool access for users via self-serve portal
- ✓ Lower IT administration overhead



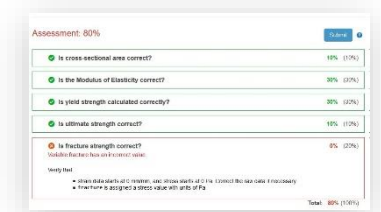
Personal computers & mobile devices



Clusters & HPC



Self-paced online learning



Auto-graded homework



# Available products

## R2023b at a glance

- AI, Data Science and Statistics
- Application Deployment
- Code Generation
- Math and Optimization
- Parallel Computing
- Event-Based Modeling
- Physical Modeling
- Real-Time Simulation and Testing
- Simulation Graphics and Reporting
- Verification, Validation, and Test



### Academic Resources

MATLAB Grader  
Online Training Suite

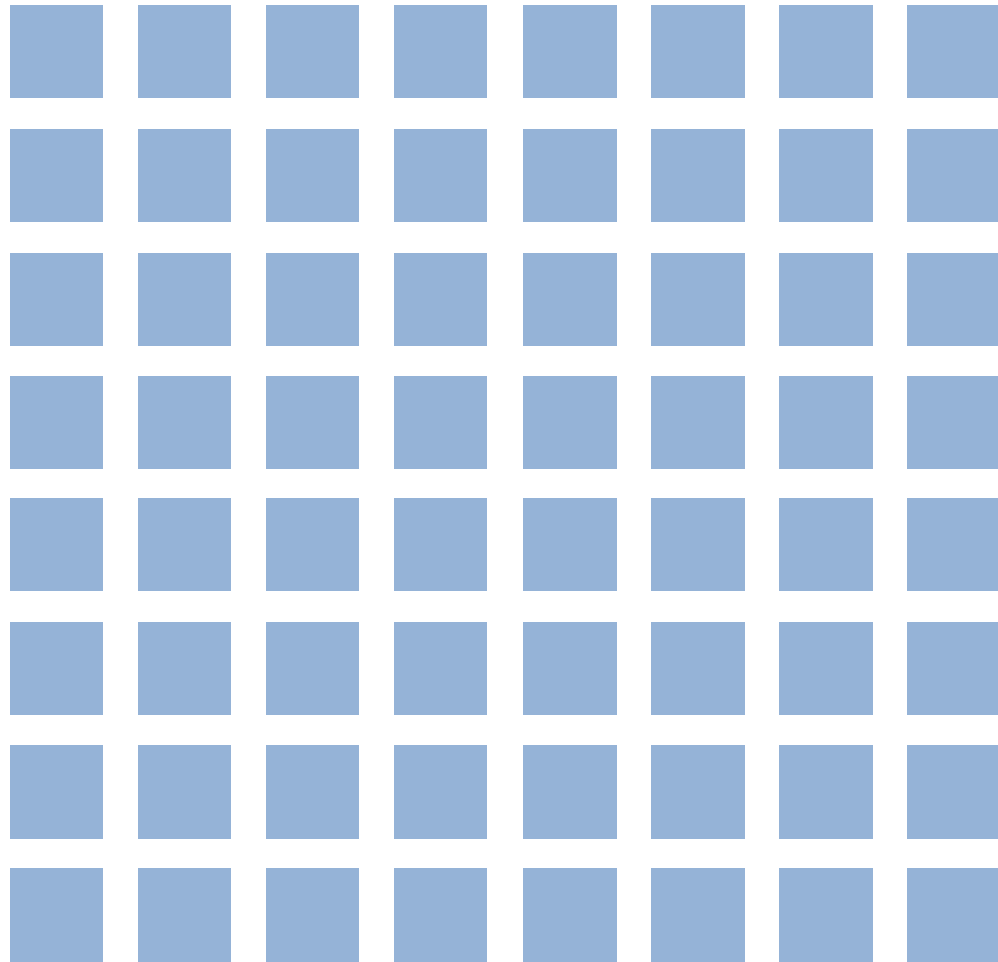
### Organized Alphabetically

5G Toolbox  
Aerospace Blockset  
Aerospace Toolbox  
Antenna Toolbox  
Audio Toolbox  
Automated Driving Toolbox  
AUTOSAR Blockset  
Bioinformatics Toolbox  
Bluetooth Toolbox  
Communications Toolbox  
Computer Vision Toolbox  
Control System Toolbox  
Curve Fitting Toolbox  
C2000 Microcontroller Blockset  
Data Acquisition Toolbox  
Database Toolbox  
Datafeed Toolbox  
DDS Blockset  
Deep Learning HDL Toolbox  
Deep Learning Toolbox  
DSP HDL Toolbox  
DSP System Toolbox  
Econometrics Toolbox  
Embedded Coder  
Filter Design HDL Coder  
Financial Instruments Toolbox  
Financial Toolbox  
Fixed-Point Designer  
Fuzzy Logic Toolbox  
Global Optimization Toolbox  
GPU Coder  
HDL Coder  
HDL Verifier  
Image Acquisition Toolbox  
Image Processing Toolbox  
Industrial Communication Toolbox  
Instrument Control Toolbox  
Lidar Toolbox  
LTE Toolbox  
Mapping Toolbox  
MATLAB  
MATLAB Coder  
MATLAB Compiler

MATLAB Compiler SDK  
MATLAB Grader  
MATLAB Parallel Server  
MATLAB Production Server  
MATLAB Report Generator  
MATLAB Test  
MATLAB Web App Server  
Medical Imaging Toolbox  
Mixed-Signal Blockset  
Model Predictive Control Toolbox  
Model-Based Calibration Toolbox  
Motor Control Blockset  
Navigation Toolbox  
Online Training Suite  
Optimization Toolbox  
Parallel Computing Toolbox  
Partial Differential Equation Toolbox  
Phased Array System Toolbox  
Polyspace Bug Finder  
Polyspace Code Prover  
**Polyspace Test**  
Powertrain Blockset  
Predictive Maintenance Toolbox  
Radar Toolbox  
Reinforcement Learning Toolbox  
Requirements Toolbox  
RF Blockset  
RF Toolbox  
RF PCB Toolbox  
Risk Management Toolbox  
Roadrunner  
Roadrunner Asset Library  
Roadrunner Scenario  
Roadrunner Scene Builder  
Robotics System Toolbox  
Robust Control Toolbox  
ROS Toolbox  
Satellite Communications Toolbox  
Sensor Fusion and Tracking Toolbox  
SerDes Toolbox  
Signal Processing Toolbox  
Signal Integrity Toolbox

SimBiology  
SimEvents  
Simscape  
Simscape Battery  
Simscape Driveline  
Simscape Electrical  
Simscape Fluids  
Simscape Multibody  
Simulink  
Simulink 3D Animation  
Simulink Check  
Simulink Code Inspector  
Simulink Coder  
Simulink Compiler  
Simulink Control Design  
Simulink Coverage  
Simulink Design Optimization  
Simulink Design Verifier  
Simulink Desktop Real-Time  
**Simulink Fault Analyzer**  
Simulink PLC Coder  
Simulink Real-Time  
Simulink Report Generator  
Simulink Test  
SoC Blockset  
Spreadsheet Link  
Stateflow  
Statistics and Machine Learning Toolbox  
Symbolic Math Toolbox  
System Composer  
System Identification Toolbox  
Text Analytics Toolbox  
UAV Toolbox  
Vehicle Dynamics Blockset  
Vehicle Network Toolbox  
Vision HDL Toolbox  
Wavelet Toolbox  
Wireless HDL Toolbox  
Wireless Testbench  
WLAN Toolbox

# Always have the latest tools with the Campus-Wide License



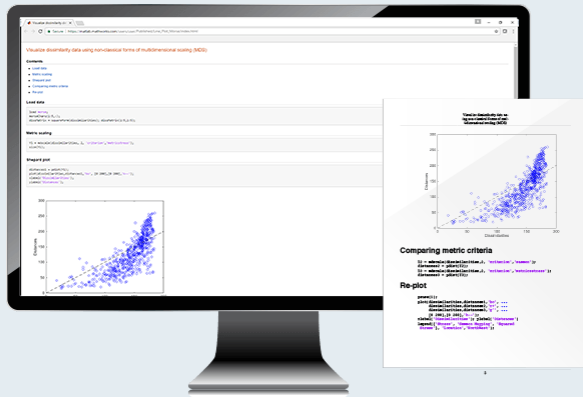
Products on your Campus-Wide License

- Whenever we release new products for Academic Use, they will be added to your Campus-Wide Licenses at no charge
- New products are often in high demand application areas such as AI, robotics, and autonomous vehicles
- Users just need to download latest release to get the products used in course

# ACCELERATING LEARNING AND RESEARCH

## MATLAB & SIMULINK

Anytime, Anywhere Access for Faculty, Staff, Students, and Visitors



### MATLAB for Desktops

Access MATLAB on personal and university-owned machines



### MATLAB & Simulink Online

Access MATLAB & Simulink in a web browser



### MATLAB Mobile

Access MATLAB on iOS/Android devices

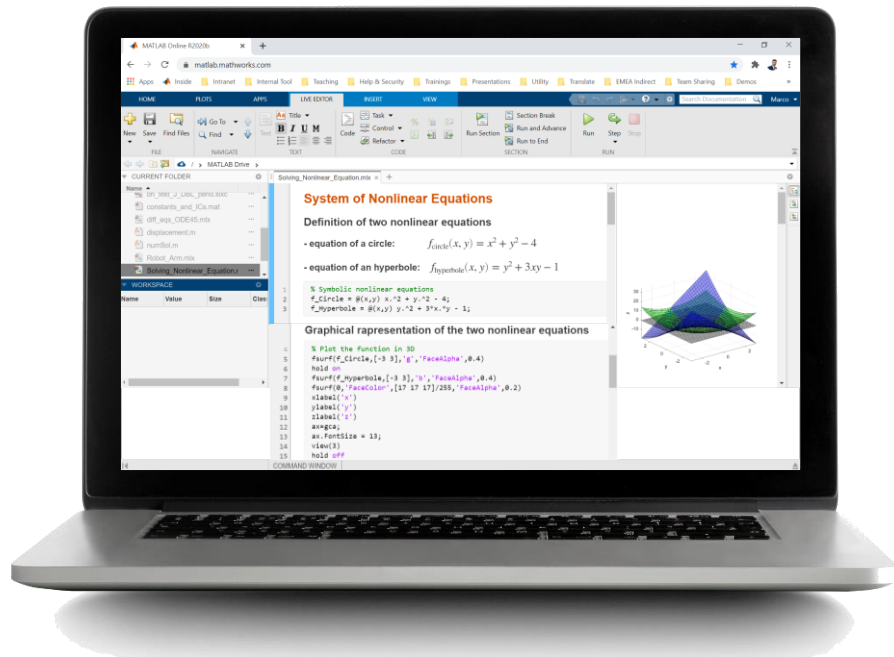
[Visit matlab.mathworks.com](https://matlab.mathworks.com)



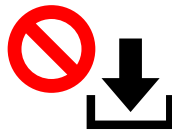
# MATLAB Online & MATLAB Drive

Access MATLAB with web browser

<https://matlab.mathworks.com>



everywhere



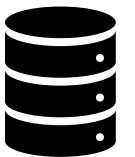
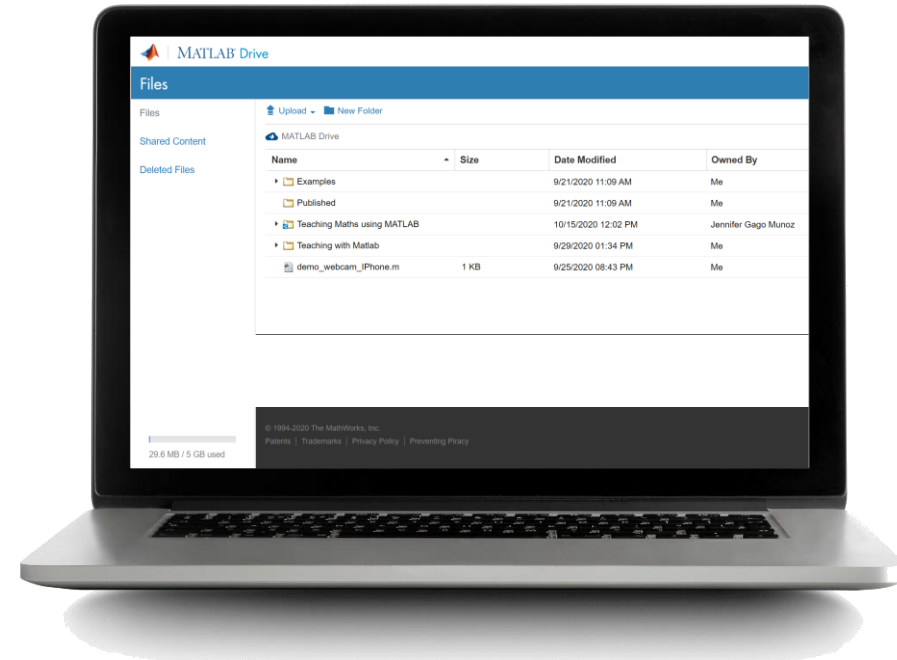
no download



cloud

For more info on **MATLAB Online**  
have look [here](#)

<https://drive.matlab.com>



up to 20Gb



cloud



share

For more info on **MATLAB Drive**  
have look [here](#)










# Academic Resources

- Online Courses
- MATLAB Grader
- Other Resources
- Code Interoperability




# Academic Online Training Suite

## Getting Started

 FREE	 FREE
MATLAB Onramp	Simulink Onramp
 NEW FREE	 NEW FREE
Reinforcement Learning Onramp	Control Design Onramp with Simulink
 NEW FREE	 FREE
Signal Processing Onramp	Stateflow Onramp
 FREE	 NEW FREE
Deep Learning Onramp	Image Processing Onramp
 FREE	
Machine Learning Onramp	

## Data Science

	
Deep Learning with MATLAB	Machine Learning with MATLAB

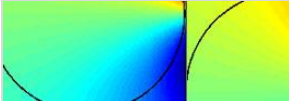
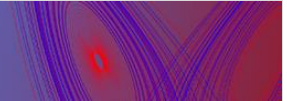
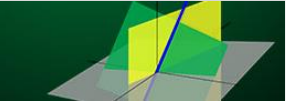

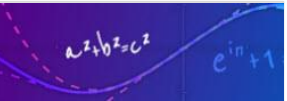


<https://matlabacademy.mathworks.com/>

## Core MATLAB

			 NEW
MATLAB Fundamentals	MATLAB for Data Processing and Visualization	MATLAB Programming Techniques	Image Processing with MATLAB

## Computational Mathematics

				
Solving Nonlinear Equations with MATLAB	Solving Ordinary Differential Equations with MATLAB	Introduction to Linear Algebra with MATLAB	Introduction to Statistical Methods with MATLAB	Introduction to Symbolic Math with MATLAB

# Academic Online Training Suite

The screenshot displays the MATLAB Onramp training interface. At the top, a blue header bar contains a back arrow, the text "MY COURSES", the course title "MATLAB Onramp" with a "(3% complete)" status, and the user's name "Alessio Conte" with a profile icon and a help icon. Below the header, a grey navigation bar shows a hamburger menu icon, the current section "2.1 Entering Commands", and "PREVIOUS" and "NEXT" navigation arrows.

The main content area is divided into three vertical panels. The left panel, titled "Task 1", contains the following text: "You can execute commands by entering them in the command window after the MATLAB prompt (>>) and pressing the **Enter** key." Below this is a blue-bordered box labeled "TASK" with the instruction: "Try multiplying the numbers 3 and 5 together with the command `3*5`." At the bottom of this panel are links for "Hint" and "See Solution". A vertical list of task titles (Task 2 through Task 7) and "Further Practice" is visible on the far left.

The middle panel, titled "HOME", shows a MATLAB command window with the prompt ">>" and a cursor. The text "Task 1" is displayed above the prompt.

The right panel, titled "WORKSPACE", contains a table with two columns: "Name" and "Value". The table is currently empty.

# Online Training Suite

Learn MATLAB at your own pace

- Learn anytime, anywhere – online or desktop access
- Learn by doing
- Track progress and share accomplishments



## Course Completion Certificate

Marco Rossi

has successfully completed **100%** of the self-paced training course

MATLAB Onramp

CRAIG A. SHUSTER  
DIRECTOR, TRAINING SERVICES



16 November 2020

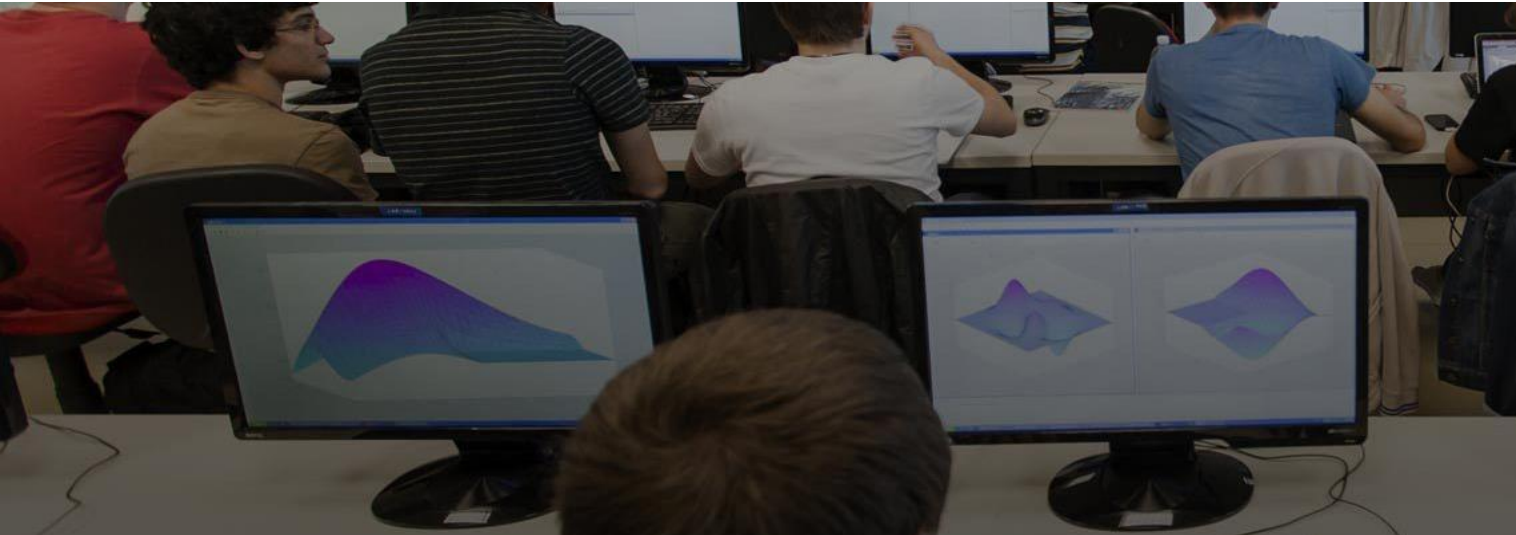
← MY COURSES MATLAB Fundamentals (2% complete)

☰ 4.3 Creating Evenly-Spaced Vectors: (4/8) Use Colon Operator and Linspace

	HOME	LIVE EDITOR	VIEW
Task 1	<div style="border: 1px solid #ccc; padding: 5px;"> <div style="display: flex; justify-content: space-between;"> <span>Text</span> <span>Code</span> </div> <div style="font-family: monospace; padding: 5px;">           x = linspace(5,15,13)         </div> </div>		
Task 2			
Task 3			
<div style="border: 1px solid #ccc; border-radius: 10px; padding: 10px; background-color: #e0f2f7;"> <p><b>TASK</b></p> <p>Create a variable named <code>x</code> that contains the row vector shown below.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0; display: inline-block;">             3 5 7 9 11           </div> </div> <p style="margin-top: 10px;"> <a href="#">Hint</a>   <a href="#">See Solution</a>   <a href="#">Reset</a>  <a href="#">Course Quick Reference</a> </p> <div style="display: flex; justify-content: flex-end; gap: 10px;"> <input type="button" value="Submit"/> <input type="button" value="Next task"/> </div> <p style="margin-top: 10px;"><b>Test Results: Correct!</b></p> <ul style="list-style-type: none"> <li>✓ Is x defined correctly?</li> <li>✓ Does script not contain square brackets?</li> </ul>			



# Online Assessments with MATLAB Grader



Create interactive course assignments



Automatically grade student work and provide feedback



Run your assignments in any learning environment

System Dynamics and Control > System Dynamics and Control Example Problems >

## Linearization of a Function Actions ▾

[← Back to Instructor View](#)

In this problem you will use your knowledge of linear functions to complete to determine a linear approximation of a nonlinear function  $y = f(x)$  at the operating point  $(\bar{x}, \bar{y})$ .

Complete the script by defining the slope and y-intercept of the linear function that approximates a  $f(x)$  at  $\bar{x}$ . Assign the slope and y-intercept to the variables  $m$  and  $b$  respectively. The following variables have been defined for you:

- $\bar{x}$ : the x-value of the operating point
- $\bar{y}$ : the y-value of the operating point
- $k$ : the derivative of  $f$  evaluated at the operating point ( $k = f'(\bar{x})$ )

### Script Reset MATLAB Documentation

```

1 xbar = 0.5;
2 ybar = 0.75;
3 k = 1;
4 % Calculate the slope and y-intercept of the linear approximation about
5 % given operating point
6 m = k           % slope of the linear approximation
7 b = ybar - k*xbar
8

```


[▶ Run Script](#) ?

**Assessment: All Tests Passed** [Submit](#) ?

✔ Is m defined correctly?

✔ Is b defined correctly?

# MATLAB Grader

- ❑ Can be used in the Hosted Version  or in the LMS Version
- ❑ Problem Collections to use already ready problems
- ❑ Share your own collections with other lecturers
- ❑ Very much used in academia



**3,000+** instructors

**350,000+** students

**Over 20 million** student  
submissions

# MATLAB Grader for Teaching

## Webinar for Lecturers

- MATLAB services to support Hybrid Teaching and Learning
- Online teaching tools: MATLAB Online, MATLAB Drive, MATLAB Mobile, Online Training
- Available courseware material
- Should I use my lecture time to teach MATLAB?
- Automatic assessment of MATLAB-based exercise
- Course creation
- Integration with Moodle, Blackboard, Canvas, etc...
- How to provide feedback from distance
- MATLAB Apps, Virtual Labs, Hardware Projects
- Make MATLAB available to your students

To register:

**6 December 2023**

## Who Should Attend

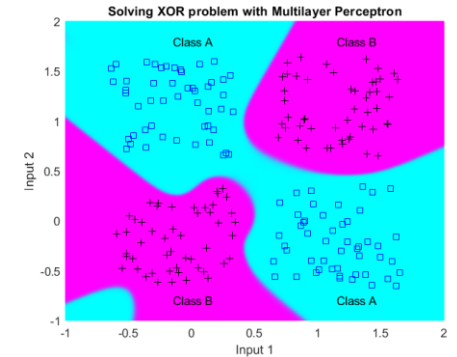
- Professors
- Lecturers
- Teaching Assistants
- Graduate Students

# Teaching Fundamentals of Neural Networks with MATLAB

In this webinar attendees will explore how to utilize 'Fundamentals of Neural Networks' courseware. This material was developed by Prof. Potočník in collaboration with the MathWorks Academia Team.

The contents are mainly addressed towards undergraduate courses. However, the modular structure allows further integration within other (postgraduate) AI-based courses. Course application areas include Neural Networks, Deep Learning, Machine Learning, Industrial diagnostics and Condition Monitoring, and Autonomous Systems.

- Introduction to Neuron Models, Architectures, and Learning
- Perceptron and ADALINE
- Backpropagation
- Dynamic Networks
- Integration with Online Trainings in MATLAB Academy
- Self-organizational maps
- Practical consideration
- Modular courseware
- Radial Basis Function Networks



To register:

**30 November 2023**

# Teaching Resources



**Updated Course Content**  
within limited time constraints

mathworks.com/academia.html?s\_tid=gn\_acad

Academia Search MathWorks.com

Overview Teach Learn Research Student Programs

- Teach with MATLAB and Simulink
- Quick Start Guide
- Curriculum Enhancement
- Courseware
- Featured Courseware
- Primary and Secondary Schools
- Books
- Online Teaching
- Instructional Resources
- Virtual Labs and Projects
- Online Assessments
- MOOC Support Program

**Enhance Your Curriculum**

Resources tailored to multiple disciplines help you educate and inspire with MATLAB and Simulink.

# Teaching Resources

- Books**
- More than 2000 titles in 26 languages for educational and professional use
  - Subjects include:
    - Biosciences and Biomedical
    - Chemistry and Chemical Engineering
    - Control Systems
    - Digital Signal Processing
    - Earth Sciences
    - Economics and Computational Finance
    - Image and Video Processing
    - Mathematics
    - Mechanical Engineering
    - Neural Networks and Fuzzy Logic
    - Physics
    - Programming and Computer Science
    - Robotics
    - System Modeling and Simulation

MATLAB®  
and Simulink®  
*examples*

Simulink®  
*examples*



# Teaching Resources

## Courseware

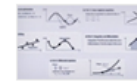
Downloadable sets of curriculum materials for educators based on MATLAB & Simulink.

- Video lectures
- Classroom materials
- Textbook references
- Homework assignments
- MATLAB and Simulink code examples

### Topics Include:

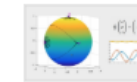
- Introduction to Programming
- Introduction to Engineering
- Bioengineering and Biological Sciences
- Chemistry
- Earth, Ocean and Atmospheric Sciences
- Economics and Finance
- Electrical and Computer Engineering
- Mechanical and Aerospace Engineering
- Mathematics
- Physics and Astronomy

## Mathematics



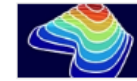
### Applied Numerical Methods with MATLAB

*Professor Steven C. Chapra*  
Tufts University



### Differential Equations and Linear Algebra

*Professor Gilbert Strang*  
Massachusetts Institute of Technology  
*Cleve Moler*  
MathWorks



### Numerical Computing with MATLAB

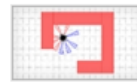
*Cleve Moler*  
MathWorks



### Teaching Calculus with MATLAB

Integrating MATLAB into a Calculus Curriculum

## Electrical and Computer Engineering



### Control of Mobile Robots

*Professor Magnus Egerstedt*  
*J.P. de la Croix*  
Georgia Institute of Technology



### Control Tutorials for MATLAB and Simulink

*Professor Bill Messner*  
*Professor Dawn Tilbury*  
*Professor Rick Hill*



### Introduction to Model-Based System Design

*Professor Marc Heneriter*  
*Professor Zachariah Chambers*  
Rose-Hulman Institute of Technology



### Advanced Model-Based System Design

*Professor Zachariah Chambers*  
*Professor Marc Heneriter*  
Rose-Hulman Institute of Technology

## Introduction to Programming



### Introduction to MATLAB Programming

*Professor Kathleen Ossman*  
*Professor Gregory Bucks*  
University of Cincinnati

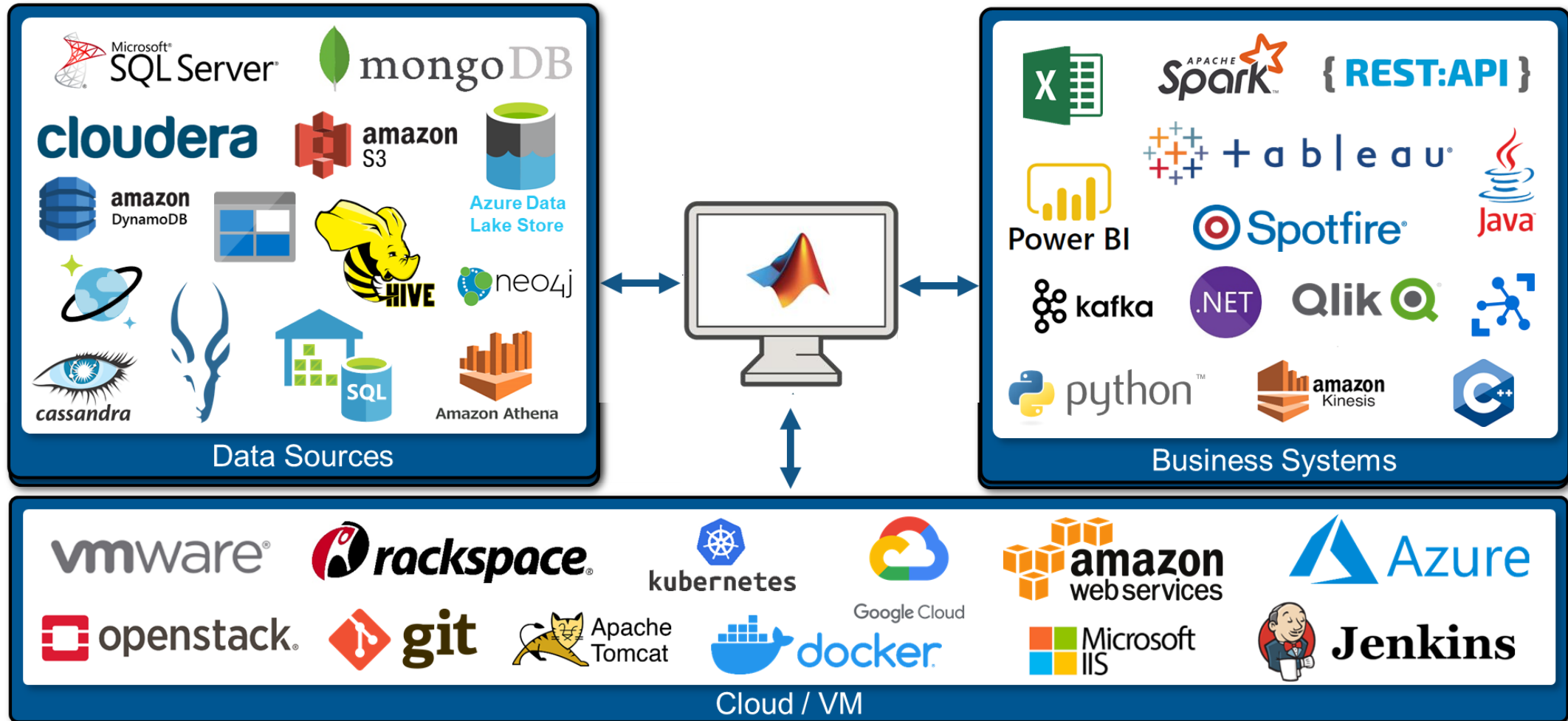


### Introduction to MATLAB

*Professor William J. Palm, III*  
University of Rhode Island

# Code Interoperability

## MATLAB and the Analytics Ecosystem





# MATLAB Meets Python: Amplifying Research Impact with Cross-Platform Integration

Join our webinar to delve into the synergy between MATLAB and Python, enabling diverse research teams to unite and unlock new opportunities for collaboration.

In this webinar you will learn how to:

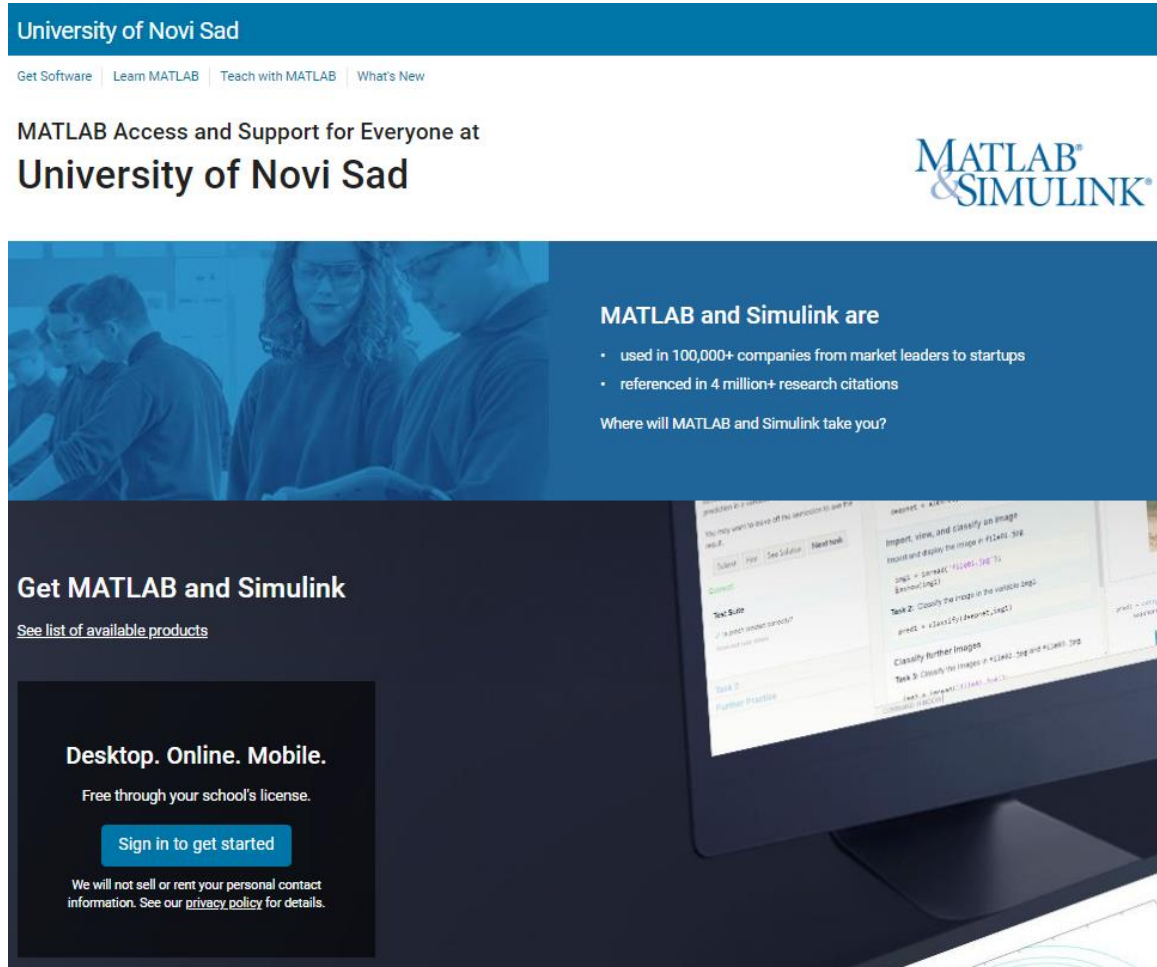
- Make your MATLAB research code available to Python users
- Make your Python research code available to MATLAB users
- Integrations with Jupyter and Visual Studio Code
- Making your code accessible in Git

To register:

**16 November 2023**



# MathWorks Portal



University of Novi Sad

Get Software | Learn MATLAB | Teach with MATLAB | What's New

MATLAB Access and Support for Everyone at  
University of Novi Sad

**MATLAB® & SIMULINK®**

**MATLAB and Simulink are**

- used in 100,000+ companies from market leaders to startups
- referenced in 4 million+ research citations

Where will MATLAB and Simulink take you?

**Get MATLAB and Simulink**

[See list of available products](#)

**Desktop. Online. Mobile.**

Free through your school's license.

[Sign in to get started](#)

We will not sell or rent your personal contact information. See our [privacy policy](#) for details.

- Hosted by MathWorks
- Self-serve solution giving individuals a guided path from login to software download and getting started
- Built-in compliance requires an official university email domain
- Online Training Access
- Teaching material

# Agenda

- MATLAB Campus-Wide License overview
- MATLAB portal for Individual Use
- License Installation and Management
- Awareness Materials
- Recent Events
- Q&A

# Agenda

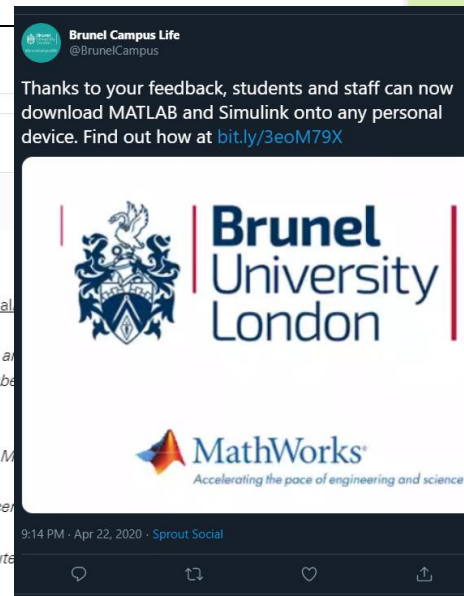
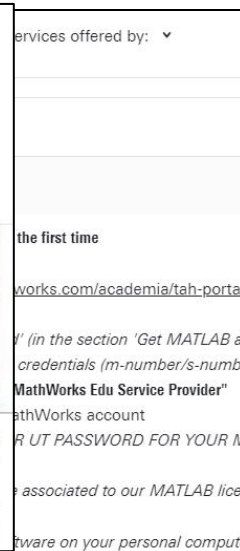
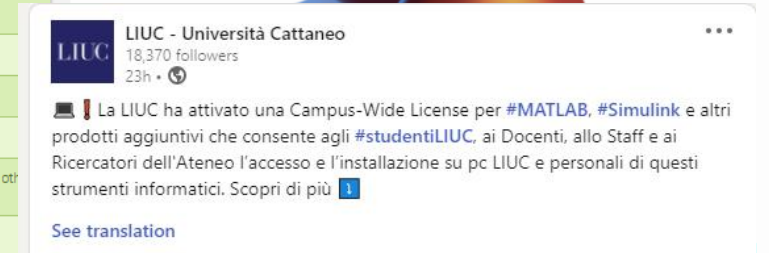
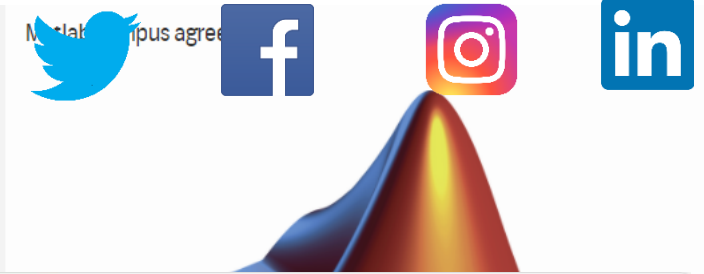
- MATLAB Campus-Wide License overview
  - MATLAB portal for Individual Use
  - License Installation and Management
- Awareness Materials
  - Recent Events
  - Q&A

# Best practices for raising awareness

Share the MATLAB portal with end users

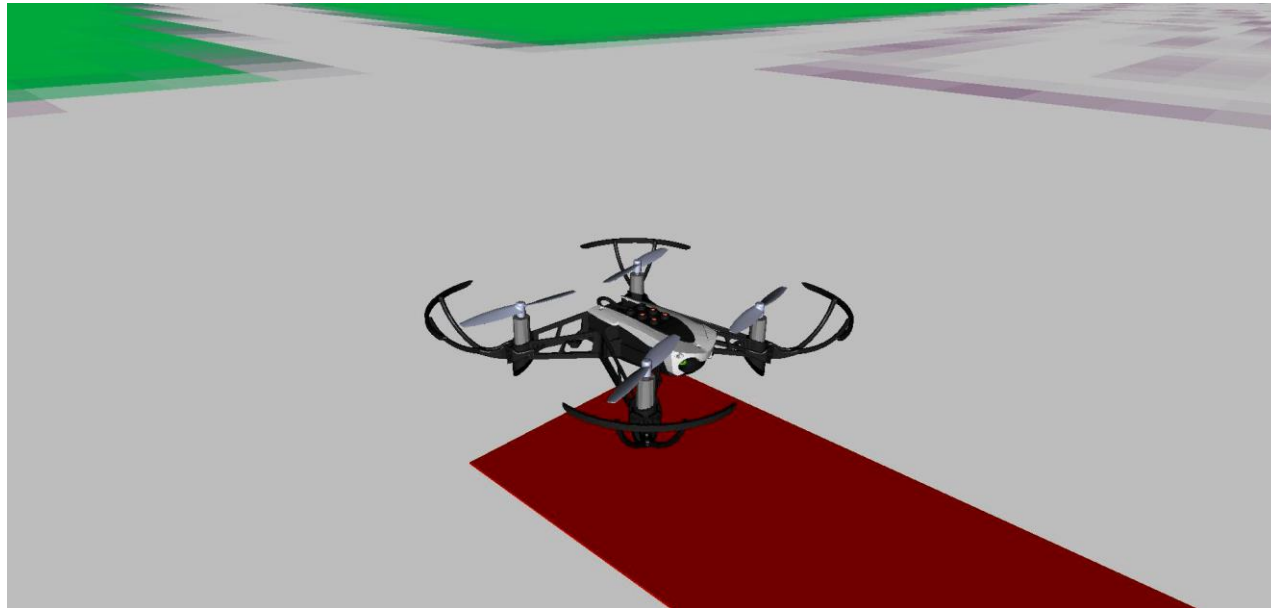
- IT Services Page
- Software Portal
- LMS
- Email to users

Student's Guide
Online services for students
Student secretariats
Training
Facilities for university contributions
Placement
Erasmus plus
International students
Opportunity
Facilities
Scholarships, research and other opportunities
Libraries
Guarantor
Business office
Guarantee Committee
Academic Calendar

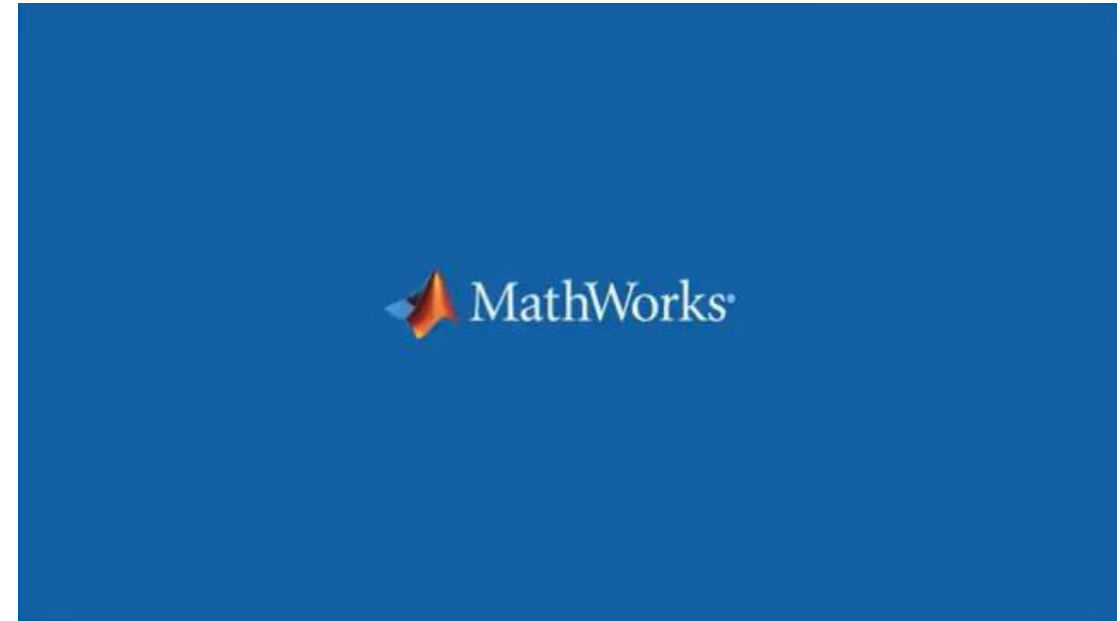
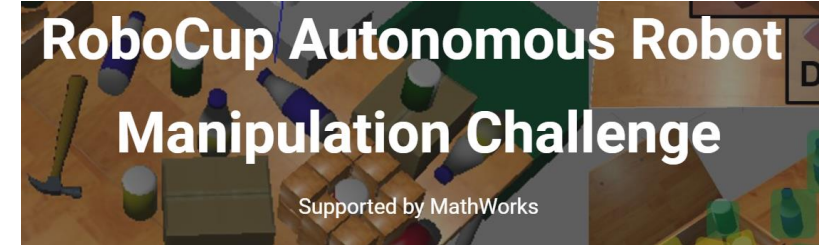


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# Student Competitions



Minidrone Competition



Formula Student



# SIMULINK

## STUDENT CHALLENGE

Show off your projects that use Simulink and you could win up to **\$1000 (USD)**.

### How to Enter

1. Create an original video that includes a:
  - Short introduction of your problem or application
  - Demonstration of how you used Simulink

2. Upload your video to YouTube with the tag **#SimulinkChallenge2023**

3. Submit an entry form **by December 12th, 2023 (1 p.m. ET)**

### Prizes for Winning Teams

1<sup>st</sup> Prize – **\$1000 (USD)**

2<sup>nd</sup> Prize – **\$500 (USD)**

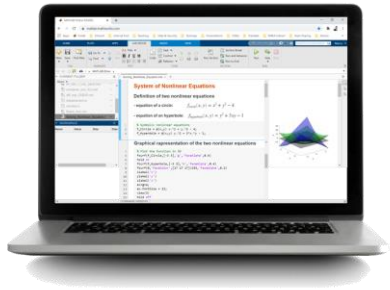
3<sup>rd</sup> Prize – **\$250 (USD)**



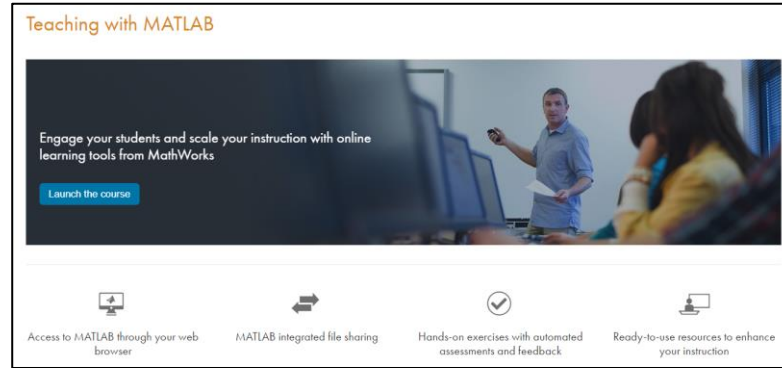
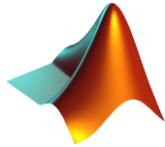
Scan the code above to find out more!

# What can I do today?

## Teaching tools



Try [MATLAB Online](#)



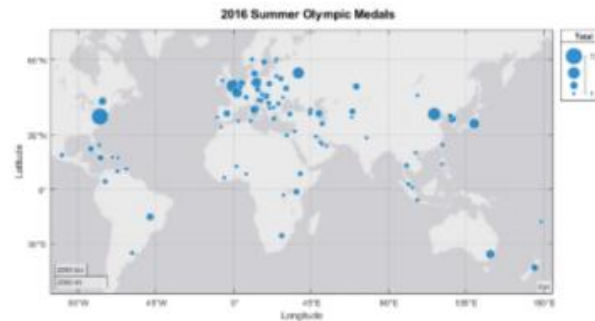
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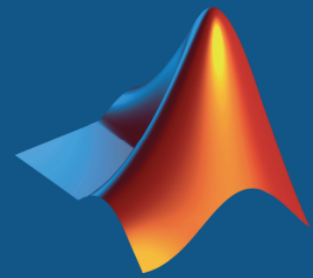


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