

Live Seminar



Online Learning and Virtual Labs with MATLAB and Simulink

Starting soon...

Online Learning and Virtual Labs with MATLAB and Simulink



Speaker

Intan Nuralisa Mat Dali
Customer Success Engineer
TechSource Systems



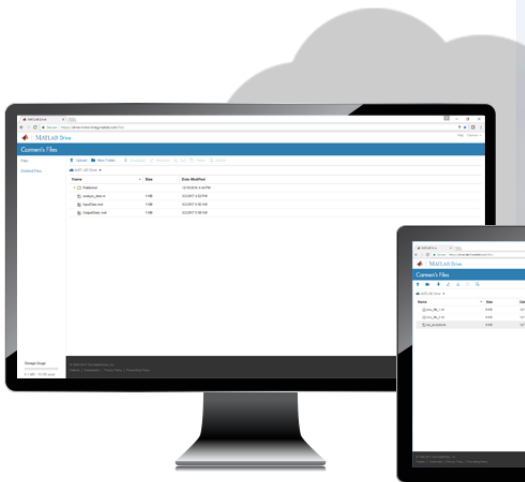
Technical Assistant

Rasyiqah 'Annani Mohd Rosidi
Application Engineer
TechSource Systems





Online course example



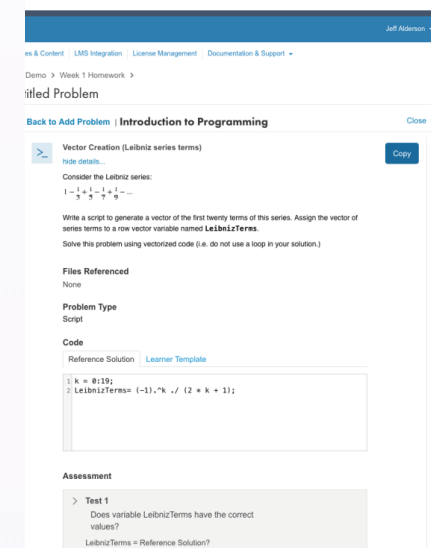
MATLAB Online

Learner Testimonials

"Wonderful course on differential equations. The teachers provide a nice computational tool to depict the dynamics of solving the equations, which is very useful for students to grasp the key ideas and concepts." - Jiting (completed this course, spending 10 hours a week on it and found the course difficulty to be medium)

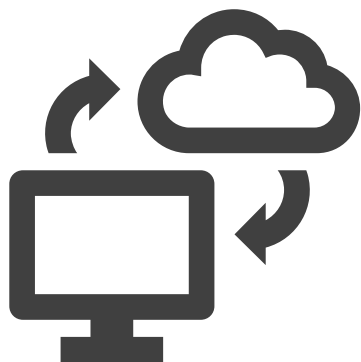
"Interesting course. Lectures, homeworks and review exercises of any part are really well setup. One of the best MOOC on topic of differential equations." - Gaetano (completed this course, spending 4 hours a week on it and found the course difficulty to be medium)

"Another excellent course from MIT. The lecture videos are excellent and so are the exercises. This course also has MATLAB based exercises which is wonderful. The problem sets are excellent and so are the staff and the community teaching assistants who are always there to help any time." - Dna47a (completed this course, spending 8 hours a week on it and found the course difficulty to be medium)



ATLAB Grader

Virtual course design



Access



Instruction



Assessment

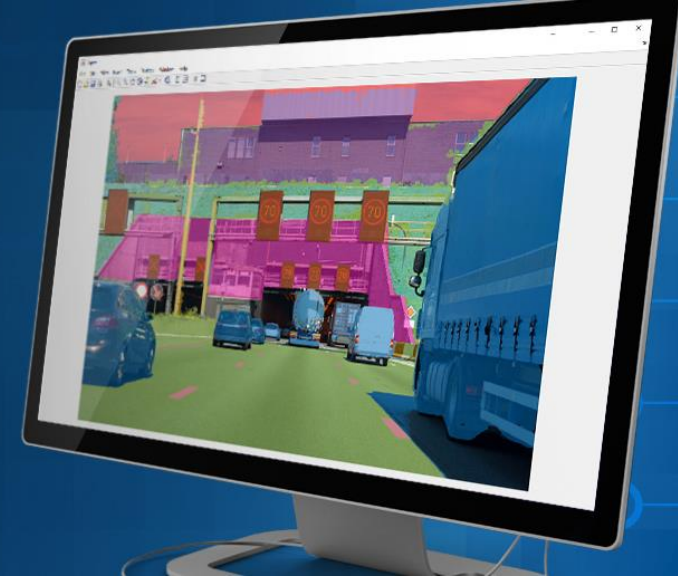


Getting Help

Our Products

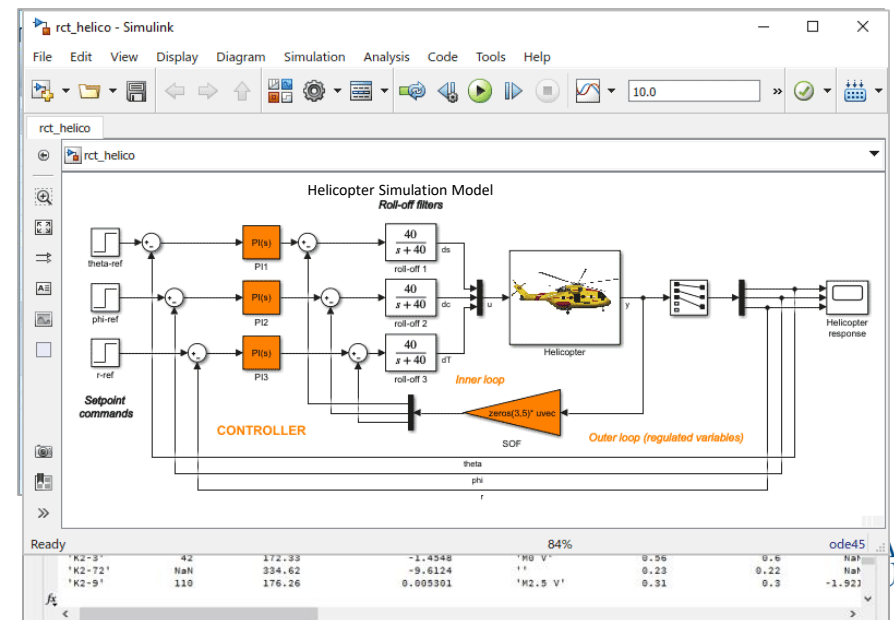
MATLAB[®]

& SIMULINK[®]



- MATLAB is a programming environment for algorithm development, data and statistical analysis, visualization, and numeric computation.
- Simulink is a graphical environment for designing, simulating, and testing systems.
- CWL offers 100 add-on products for specialized tasks.

Computer Vision System Toolbox

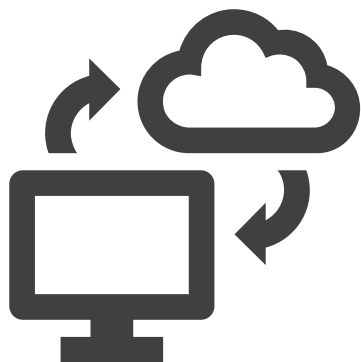


ACCESS

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ASSESSMENT

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Access



Instruction



Assessment



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Campus-wide access



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MATLAB Access and Support for Everyone at
Universiti Putra Malaysia



MATLAB and Simulink are

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

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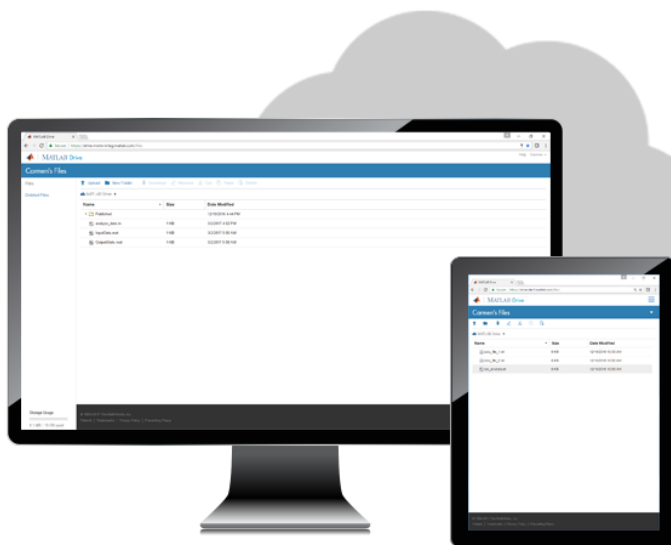
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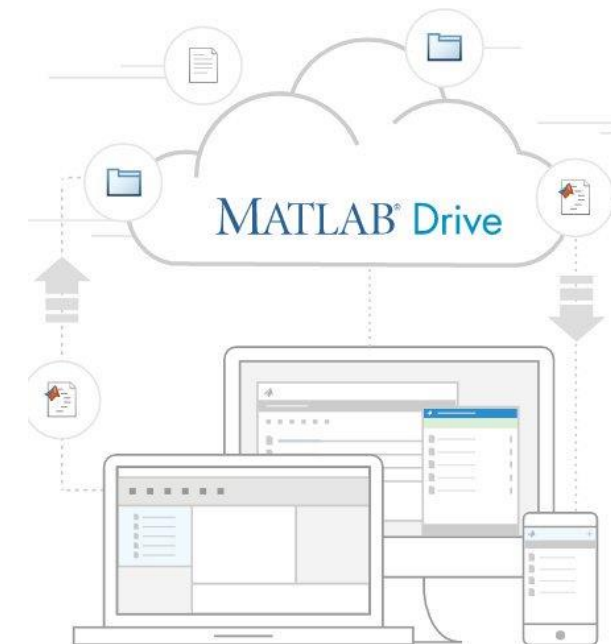
MATLAB Online



Simulink Online



MATLAB Drive



No download or installation required

Access to the latest version

No minimum device specs other than that for your web browser

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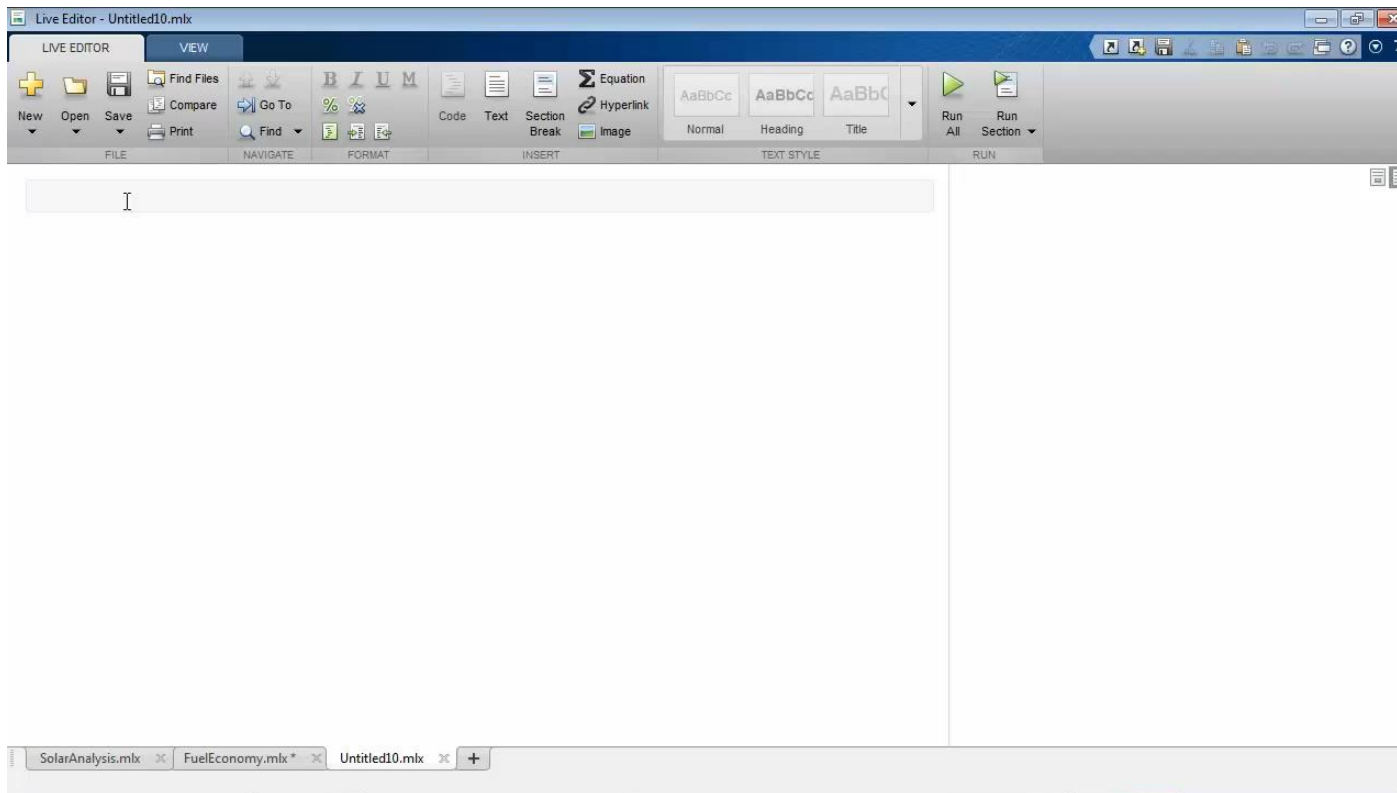
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Interactive programming with Live Editor



Features

- Teach with interactive documents
- Accelerate exploratory programming
- Create an interactive narrative
- Publish consistent reports

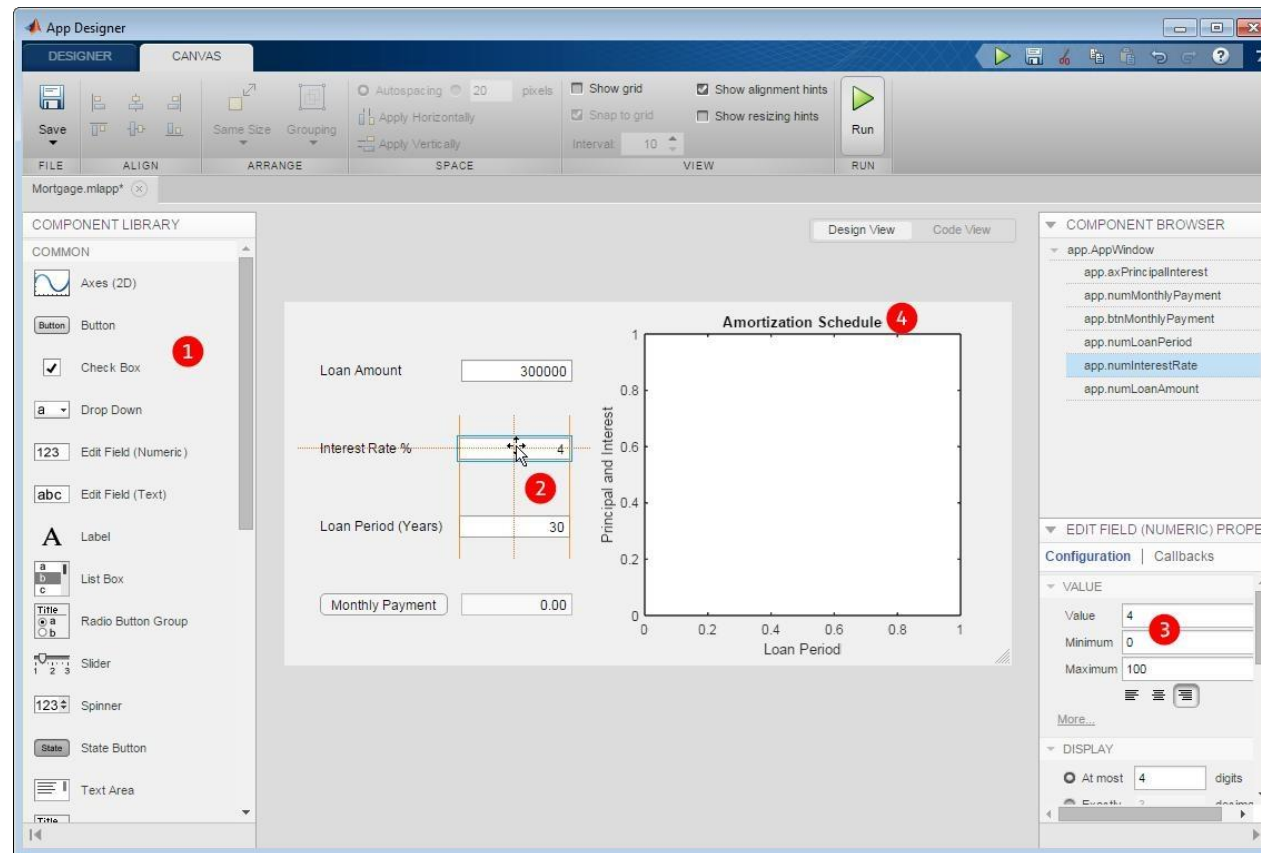
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MATLAB App Designer



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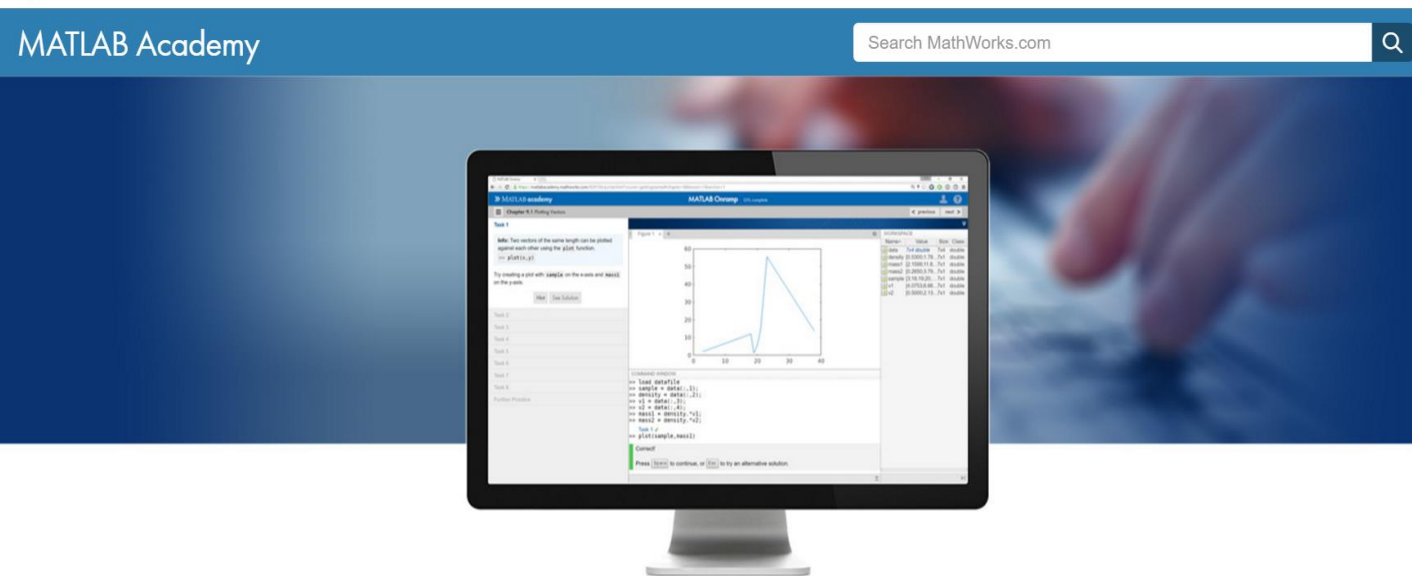
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Self-paced courses

MathWorks® Products Solutions Academia Support Community Events Company



Learn MATLAB for Free

Launch MATLAB Onramp now

"The interactive MATLAB tutorials were perfect for engaging students and getting them up to speed quickly."

—Dr. Yu-li Wang, Carnegie Mellon University

FREE COURSES (2-3 hours)

- MATLAB Onramp
- Stateflow Onramp
- Machine Learning Onramp
- Control Design Onramp with Simulink
- Simulink Onramp
- Image Processing Onramp
- Deep Learning Onramp

FOCUSED COURSES

FOUNDATIONAL COURSES (17-21 hours)

- MATLAB Fundamentals
- MATLAB Programming Techniques
- MATLAB for Financial Applications
- MATLAB for Data Processing and Viz
- Machine Learning with MATLAB
- Deep Learning with MATLAB

COMPUTATIONAL MATH COURSES (2-3 hours)

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



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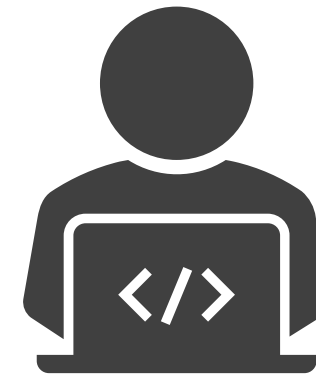
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Learn by doing

... and learn from mistakes



"Mistakes... are the portals of discovery."
—James Joyce



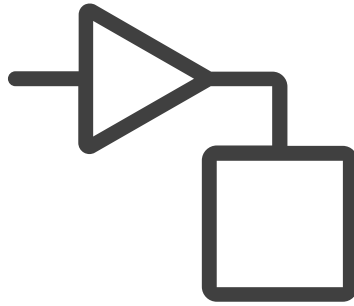
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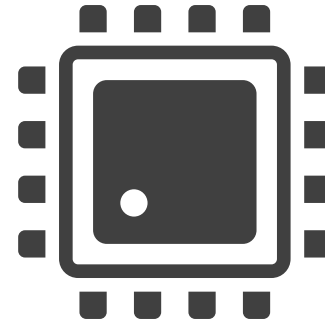
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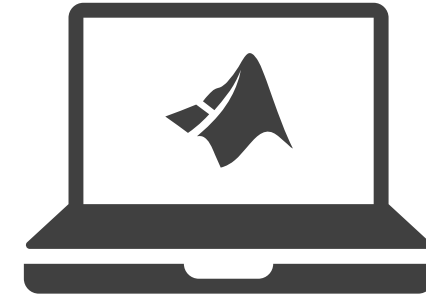
Laboratory Models



Virtual



Hardware
at Home



Remote

Complexity	High	Low	High
Interactivity	High	High	Low
Hands-On	Low	High	Low
Realism	Low	Low	High



ACCESS

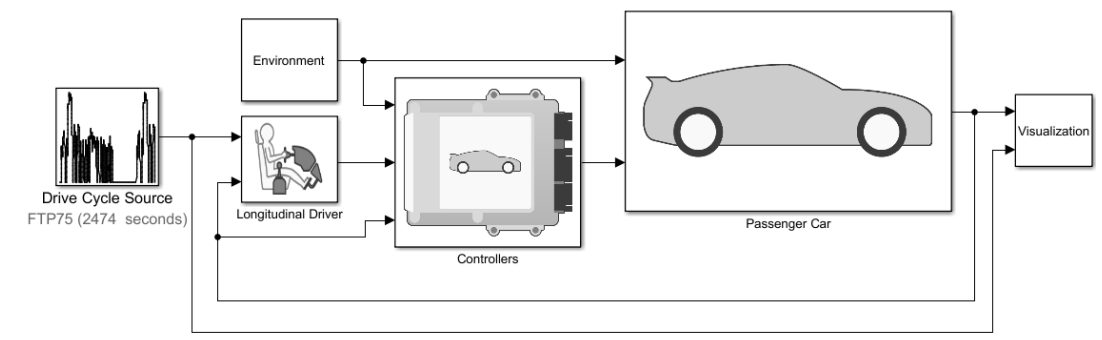
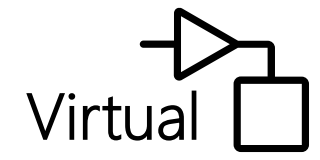
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SIMULINK®

Simulation and Model-Based Design



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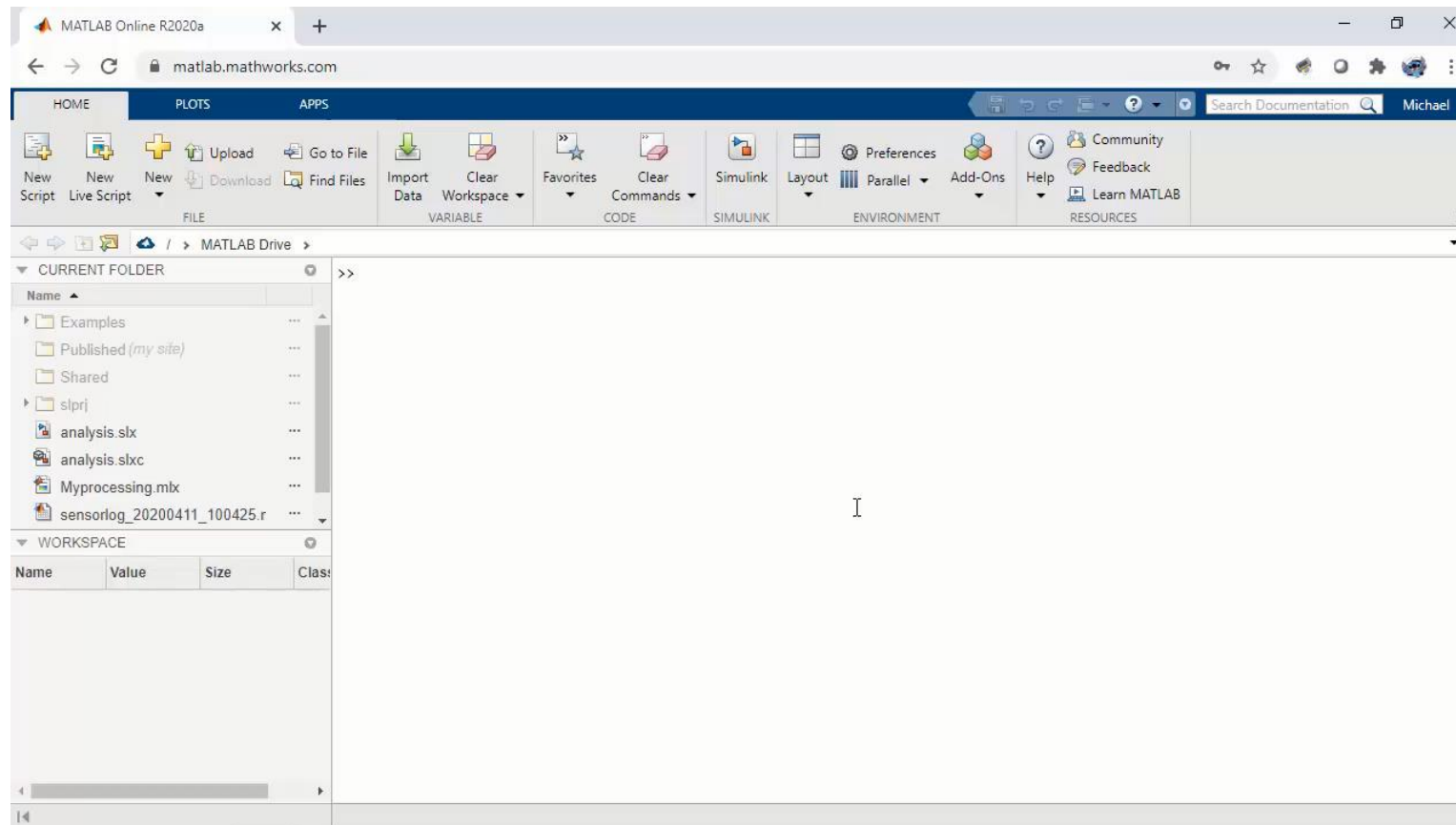
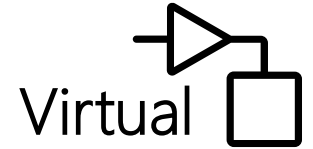
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Simulation and Model-Based Design



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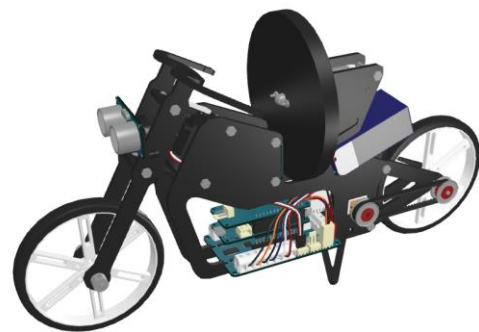
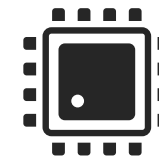
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Project-based learning with low-cost hardware

Hardware



Self-balancing robots using
Arduino



Edge Detection using
Raspberry Pi

"I really enjoyed, 'Edge AI with Raspberry Pi using MATLAB' to deploy face detection and age prediction algorithms on a Raspberry Pi. I have no experience in hardware, but I completed the tutorial and now have a strong curiosity!"

-Katie Amrine, PhD
Decision Scientist, Facebook

ACCESS

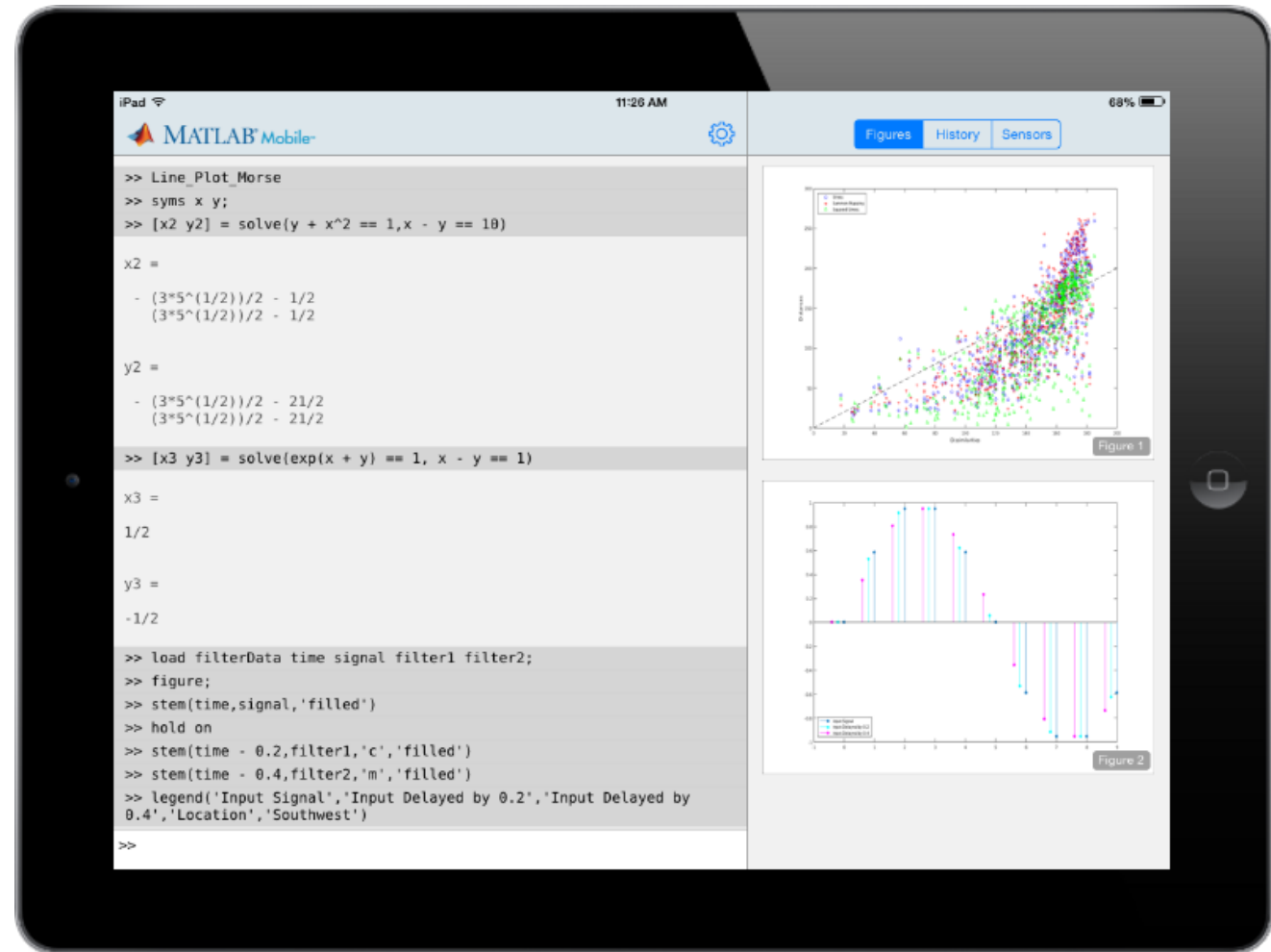
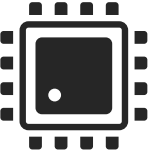
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MATLAB Mobile

Hardware



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IoT analytics platform



Send sensor data privately to the cloud.



Analyze and visualize your data with MATLAB.



Trigger a reaction.

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IMULINK[®]

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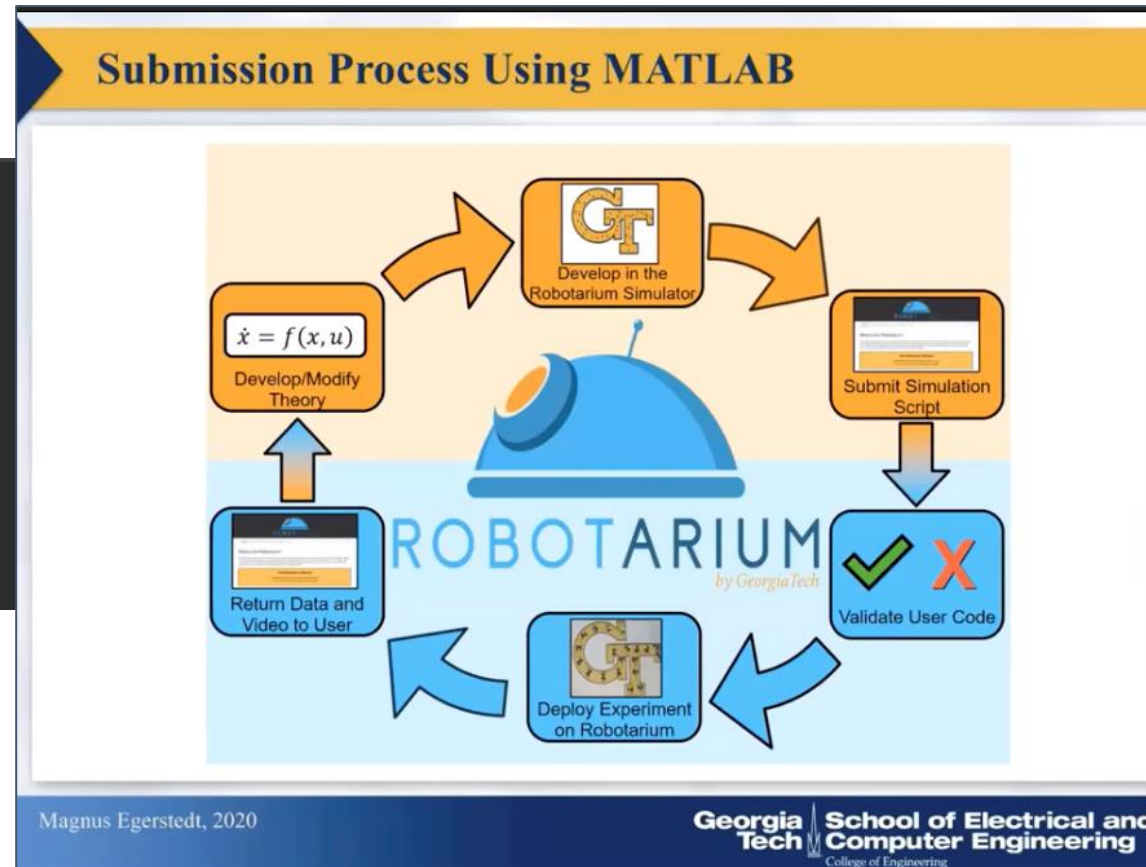
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Remote Labs

Robotarium at Georgia Tech



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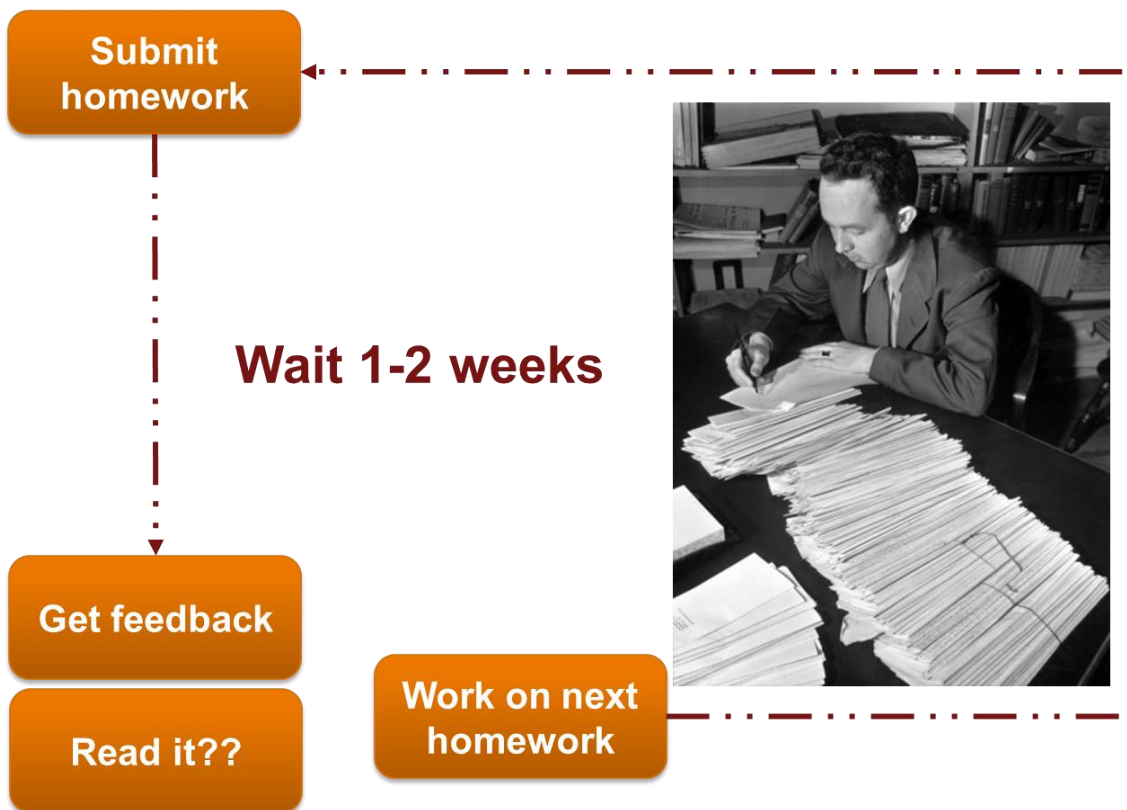
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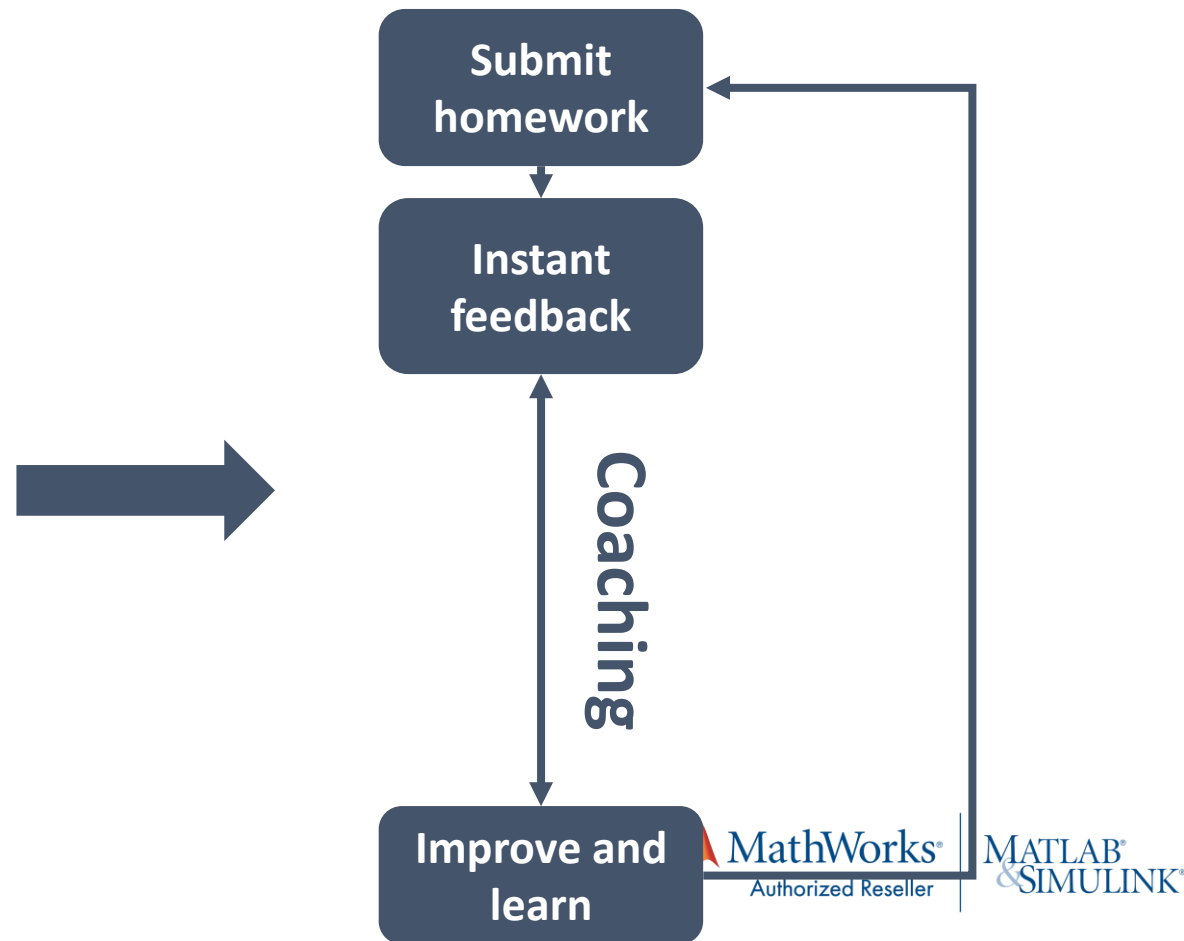
GETTING HELP

Autograde MATLAB Assignments

Traditional Grading



Autograding

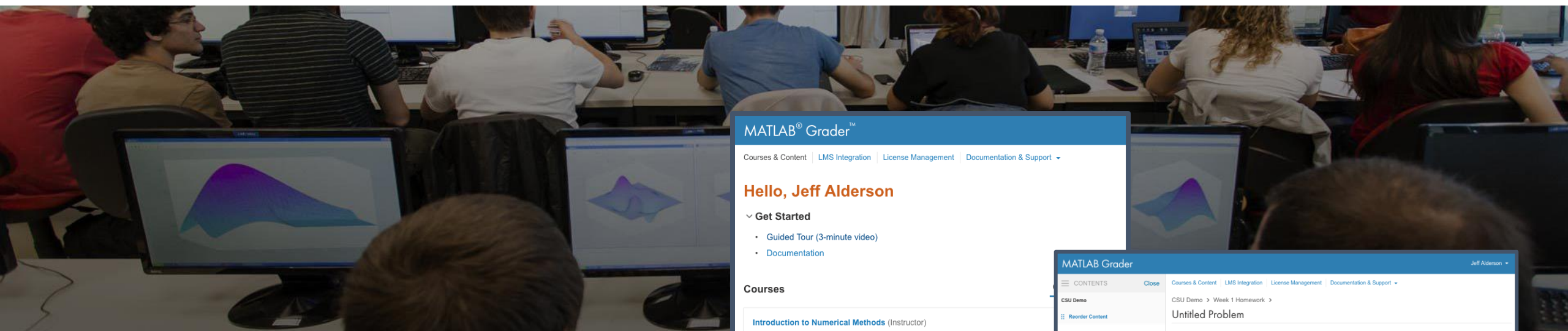


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Create interactive course assignments



Automatically grade student work and provide feedback



Run your assignments in any learning environment

MATLAB® Grader™

Courses & Content | LMS Integration | License Management | Documentation & Support

Hello, Jeff Alderson

Get Started

- Guided Tour (3-minute video)
- Documentation

Courses

Introduction to Numerical Methods (Instructor)
Created By Balaji Sharma (balaji.sharma@mathworks.com)
Duration (EDT): 01 Jan 2018 - 03 Sep 2018
3 Problems | 3 Students

Copy of Introduction to Programming (Instructor)
Created By Eric Davishahi (edavishahi@everettcc.edu)
Duration (PDT): 03 Apr 2018 - 15 Sep 2018
94 Problems | 0 Students

Example Problems (Instructor)
Created By Aditya Jain (aditya.jain@mathworks.com)
Duration (UTC): Not Specified - Not Specified
11 Problems | 0 Students

ADD COURSE

Content

Create problems outside of a course, storing them in collections. You can later use these problems in courses.

ADD PROBLEM

MATLAB Grader

CSU Demo > Week 1 Homework > Untitled Problem

Back to Add Problem | Introduction to Programming

Vector Creation (Leibniz series terms)

Consider the Leibniz series:
 $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots$

Write a script to generate a vector of the first twenty terms of this series. Assign the vector of series terms to a row vector variable named `LeibnizTerms`. Solve this problem using vectorized code (i.e. do not use a loop in your solution.)

Files Referenced
None

Problem Type
Script

Code

```
1 k = 0:19;
2 LeibnizTerms = (-1).^k ./ (2 * k + 1);
```

Assessment

Test 1
Does variable LeibnizTerms have the correct values?
LeibnizTerms = Reference Solution?

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Student Experience

"The fact that you can get immediate feedback ... is really neat, and without it, debugging your own code would really be a mess. It also motivated me to get 100% score on all the MATLAB assignments."

— Student, Virginia Tech

The screenshot displays the MATLAB Grader interface for a student. On the left, there are three panels showing the course navigation menu. The top panel shows the course structure with 'My first course' selected. The middle panel shows the 'Topic 1' selected. The bottom panel shows the 'Home' selected. The main content area shows the 'My first course' page with the breadcrumb 'Home / My courses / My first course / Topic 1 / Navigating a Robot'. Below this, the 'Navigating a Robot' assignment is shown with a code editor containing MATLAB code for robot navigation. The code includes comments and calculations for the transformation matrix T and the destination position pObjectRobot. Below the code editor, there is a 'Run Script' button. The assessment results are shown as 'Assessment: All Tests Passed' with a 'Submit' button. Two test questions are listed: 'Is the transformation matrix correct?' and 'Is the destination position in the robot coordinate frame correct?', both with green checkmarks indicating they were passed.

```
1 pRobotWorld = randi([-5 5], [2 1]) % Position of robot in the world frame in range [
2 theta = 2*pi*rand % Rotation of robot in radians
3 pObjectWorld = randi([-5 5], [2 1]) % Position of object in the world frame in ran
4
5 % Calculate T
6 T = [cos(theta), -sin(theta), pRobotWorld(1); sin(theta), cos(theta), pRobotWorld(2)
7
8 % Use the inverse of T (or backslash operator to find the homogenous
9 % position in the robow frame. Make sure to add a 1 to destWorld
10 pObjectRobot = inv(T)*[pObjectWorld; 1];
11
12 % Now take only the first two elements of pr since we are in 2-D
13 pObjectRobot = pObjectRobot(1:2);
14
15
```

Assessment: All Tests Passed

- ✓ Is the transformation matrix correct?
- ✓ Is the destination position in the robot coordinate frame correct?

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Grading and Learning Metrics

My first course: View: User report

[Home](#) / [My courses](#) / [My first course](#) / [Grades](#) / [Grade administration](#) / [User report](#)

User report - Sam Student

[Overview report](#) [User report](#)

Grade item	Calculated weight	Grade	Range	Percentage	Feedback	Contribution to course total
My first course						
Navigating a Robot	100.00 %	100.00	0-100	100.00 %		100.00 %
Σ Course total	-	100.00	0-100	100.00 %		-

“The approach enables students to **learn more quickly** from their mistakes on their own.”

– Dr. Bob Canfield, Virginia Tech

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Grading and Learning Metrics

MATLAB Grader

Vector Creation (creating equally spaced vectors)

Vector Creation (creating equally spaced vectors)

Learner Analytics

Class Overview Learner Solutions

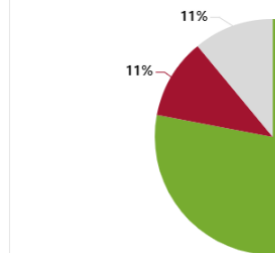
Learner Analytics

Class Overview Learner Solutions

Map View List View Search by last n

Status Summary

9 Learners are in the course.

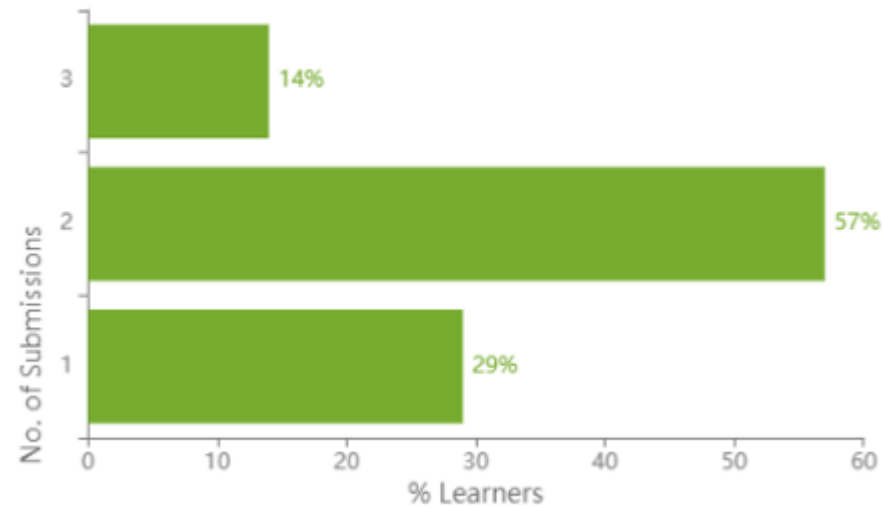


■ Solved: 78% (7)
■ Submitted, not solved: 11% (1)
■ No solutions submitted: 11% (1)

Solved:
7 Learners have solved the problem.

Submissions Required to Solve the Problem

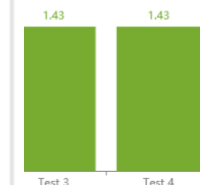
Mean: 2



Edit Actions

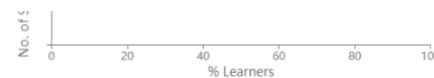
Elvira Osuna-Higley

Edit Actions



or, students can
ce until they are
ticing deeper
my students."

Learner Preview



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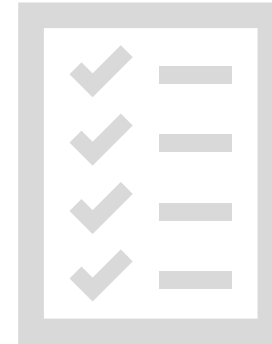
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Assessment



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MATLAB Courseware

Teaching resources created by your peers

MATLAB Courseware

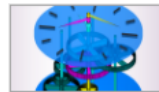
[Educator Home](#) | [Classroom Resources](#) | [Hardware Support](#) | [License Options](#) | [Research](#)

Introduction to Engineering



Engineering Models I

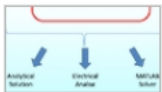
*Professor Kathleen Ossman
Professor Gregory Bucks
University of Cincinnati*



Engineering Models II

*Professor Kathleen Ossman
Professor Gregory Bucks
University of Cincinnati*

Bioengineering and Biological Sciences



Bioengineering Mass Transport and Systems

*Professor Alyssa Taylor
University of Washington*



Instrumentation, Measurement and Control in Biological Systems

*Professor Kumar Mallikarjunan
Virginia Polytechnic Institute & State University*

Earth, Ocean, and Atmospheric Sciences



Teaching Geoscience with MATLAB

from SERC@Carleton

Teaching Kits for Free

Download content consisting of:

- Lecture Notes
- Project Ideas
- Accompanying Code



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Training for Educators

Engage your students and scale your instruction with online learning tools from MathWorks

Launch the course



Access to MATLAB through your web browser



MATLAB integrated file sharing



Hands-on exercises with automated assessments and feedback



Ready-to-use resources to enhance your instruction

3
JNK®

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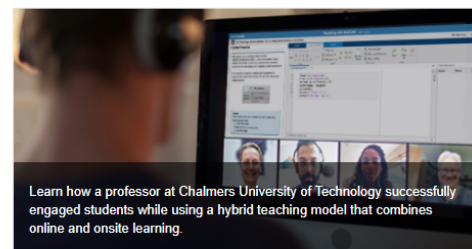
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Online Teaching with MATLAB and Simulink

Whether you are transitioning a classroom course to a hybrid model, developing virtual labs, or launching a fully online program, MathWorks can help you foster active learning no matter where it takes place. Here you will find resources and ideas for providing hands-on experiences with MATLAB and Simulink, plus tools for delivering instruction, engaging students, and assessing outcomes.



Instructional Resources



Virtual Labs and Projects



Online Assessments

Create Engaging, Interactive Course Materials

Make your courses more interactive, promote self-directed learning, and increase student engagement through Live Editor and MATLAB apps.

Use MATLAB on the desktop or MATLAB Online to create live scripts. Share live scripts with students through your university's learning management system or using MATLAB Drive. Learn more about creating and sharing live scripts for applications such as flipped classrooms on the [Instructional Resources page](#).

In addition, you can host and run a collection of MATLAB apps on your own MATLAB Web App Server at your university.

Keep Teaching through Distance Learning

Posted by [Loren Shure](#), March 23, 2020

As many universities are moving quickly to distance learning, it is vital for educators to think carefully about how to adapt their approach to still deliver key learning outcomes for students in an online setting.

[» Read more...](#)

Discussions

[Start a discussion](#)



Welcome to the Distance Learning Community

Latest activity by [jiro](#) on 30 Mar 2020 at 13:17

Tags: [distance_learning](#)

0

replies



Tell us your story

Latest activity by [jiro](#) on 30 Mar 2020 at 13:05

Tags: [distance_learning](#)

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replies

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Authorized Reseller



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Next Steps Checklist

- ✓ Complete the [Online Training for Educators](#)
- ✓ Add [MATLAB Onramp and/or Simulink Onramp](#) to courses
- ✓ Convert coding examples to interactive [Live Scripts](#)
- ✓ Tell your LMS administrator to add [MATLAB Grader](#) to your LMS
- ✓ Virtualize your labs with [MATLAB Mobile](#) and [ThingSpeak](#)

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TechSource Systems Edu Team

consult with faculty and researchers to support them with their STEM initiatives, including integrating computational or systems thinking into their curriculum.

intan.matdali@techsource-asia.com



Prepare for In-Demand Careers

With a Campus-Wide License, students gain access to the same tools used by engineers and scientists. They'll develop the computational skills needed for in-demand careers in IoT, deep learning, artificial intelligence, autonomous systems, robotics, neuroscience, and finance, or for [building their own startup](#) (2:17).

"Everyone who comes in as a new hire already knows MATLAB, because they all had it in college. The learning curve is significantly lessened as a result."

Jeff Corn, Chief of Engineering Projects Section U.S. Air Force

More than **3.9 million students and over 1,200 universities** around the world—including the top 10 ranked universities—have unlimited access to MATLAB and Simulink with a Campus-Wide License.



HANDS-ON LEARNING

92,500

Faculty and students using MATLAB to program hardware

"On multidisciplinary projects, students with quite different educational backgrounds can work together more easily because they are using the same tools."

Professor Jakob Stoustrup, Aalborg University



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*



RESEARCH PRODUCTIVITY

2,570,000

Google Scholar results referencing MATLAB

"Our teams are here to do world-class research, and easy access to MATLAB enables them to be their most productive."

*Shailesh Shenoy, Director of Research Computing,
Albert Einstein College of Medicine of Yeshiva University*

UPCOMING EVENTS.....

 **SCAN ME**



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24 Aug 2022 | 15:00 (GMT+8)

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30 Aug 2022 | 15:00 (GMT+8)

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MORE THAN 54 COURSES



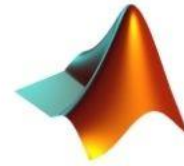
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- ✓ Accelerate your projects

READY
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TALK?

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EXIT POLL

YOUR FEEDBACK IS
VALUABLE TO US!

[Online Learning and Virtual Labs with MATLAB and Simulink - August 4th, 2022 \(office.com\)](#)



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