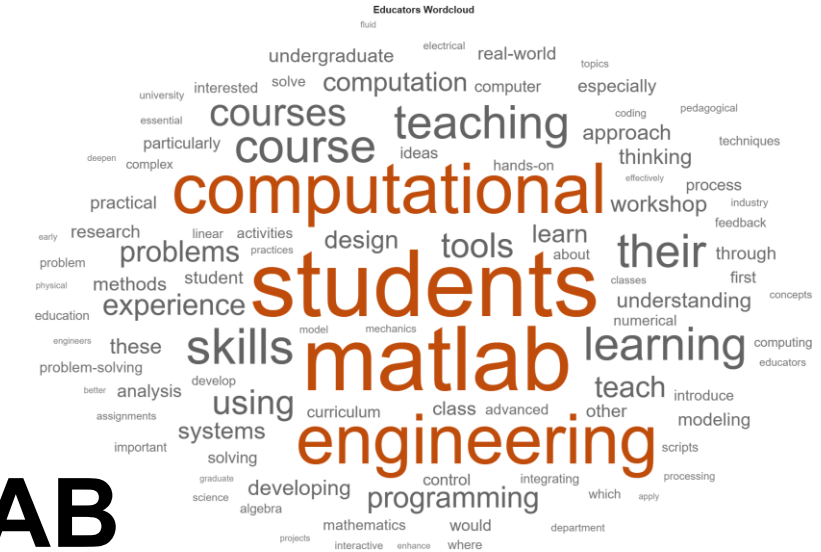


Welcome to the

12th Annual

Teaching Computation with MATLAB

Educator Workshop



2026 School Affiliations: 50 Workshop Educators

(some multiples, ~20 returning participants)

- Arizona State University East
- Bradley University (2)
- Cabrillo College
- California State University-Fullerton (2)
- California State University-Sacramento
- Cornell University
- Elon University
- Embry Riddle Aeronautical University (2)
- Howard University (2)
- Idaho State University
- Instituto Tecnológico de Costa Rica
- Lonestar college
- Louisiana State University and Agricultural & Mechanical College
- Massachusetts Institute of Technology
- Michigan Technological University
- Minnesota State University-Mankato (2)
- North Carolina A & T State University
- Rensselaer Polytechnic Institute
- San Diego State University
- San Francisco State University
- San Jose State University
- Siena University
- South Dakota State University
- St Olaf College
- Texas A&M University-San Antonio
- The University of Southern Mississippi
- The University of Tennessee-Knoxville
- The University of Texas at Dallas (3)
- University at Buffalo, State University of New York
- University of Alaska Anchorage
- University of Arizona
- University of Bridgeport
- University of Ferrara
- University of Florida (2)
- University of Hartford
- University of Maryland – College Park
- University of Nebraska-Lincoln
- University of Technology, Jamaica (2)
- University of the Incarnate Word
- University of Wisconsin-Eau Claire
- Vanderbilt University (3)
- Virginia Military Institute

2026 Teaching Activities: You Submitted 36

Review editors have reviewed and shared feedback on ~2/3 of activities

Workshops and Webinars
2026 MATLAB Workshop
Registration
Travel Information
Logistics
Pre-Work
Program
Participants
Share a Teaching Activity
Teaching Activities
Participant Workspace
Past Workshops



Teaching Computation With MATLAB®

Teaching Computation with MATLAB

Why Teach Computation?
Skills and Techniques
Computational Thinking
Visualization
Modeling
Data Analysis
Teaching Strategies
Building Self-Efficacy
Cooperative Learning
Assessment
Developing Skills Within a Degree Curriculum
Teaching Online
Events
Workshops and

Teaching Activities

Results 11 - 20 of 30 matches

[Matlab for absolute beginners: elevation surveys](#)
Lisa Gilbert, Cabrillo College
For students who have absolutely no experience with Matlab and little to no experience coding, this in-class activity is a guided introduction intended to help them develop some basic skills and confidence. The ...
Resource Type: Activities: Activities:Classroom Activity, Field Activity
Subject: Geoscience, Environmental Science

[Solar-Powered IoT Environmental Monitoring Station](#)
Anita Omo-Okhuasuyi, University of the Incarnate Word
In this four-week project, students worked in groups to develop a **Solar-Powered IoT Environmental Monitoring Station** using MATLAB. The project was designed to help students apply the programming skills learned ...
Resource Type: Activities: Activities:Project
Subject: Engineering

[Predict Before You Run: Debugging an EEGLAB/ERPLAB Script](#)
Brian Rivera, St Olaf College
Students who have just processed one EEG participant through the EEGLAB and ERPLAB menus receive a MATLAB script that repeats the same steps in code: importing a BrainVision recording, filtering, re-referencing

Edit Page

Refine the Results↓

Resource Type: Activities

Problem Set [4 matches](#)
Classroom Activity [15 matches](#)
Lab Activity [11 matches](#)
Project [10 matches](#)
Field Activity [1 match](#)
Writing Assignment [1 match](#)

Subject

Biology [1 match](#)
Chemistry [1 match](#)
Computer Science [8 matches](#)
Engineering [13 matches](#)
Environmental Science [5 matches](#)
Geoscience [5 matches](#)
Health Sciences [1 match](#)
Mathematics [6 matches](#)
Physics [2 matches](#)

Teaching Computation with MATLAB: The Full Collection

Teaching Computation With MATLAB®

- Why Teach Computation?
- Skills and Techniques**
 - Computational Thinking
 - Visualization
 - Modeling
 - Data Analysis
- Teaching Strategies
 - Building Self-Efficacy
 - Cooperative Learning
 - Assessment
 - Developing Skills Within a Degree Curriculum
- Teaching Online
- Events
 - Workshops and Webinars
- Resources
 - Teaching Materials
 - Teaching Activities**
 - Exemplary Collection
 - Activity Review Process
 - Essays
 - Courses
 - Community
 - For Team Members

Teaching Activities

Initial Publication Date: August 7, 2018
DOI | Cite this

The Teaching Computation in the Sciences Using MATLAB activities are submitted by workshop participants, community members, and other SERC community participants. All of the activities in the collection use MATLAB in some capacity and cover a variety of STEM courses and topics.

[View the Exemplary Reviewed Collection »](#)
[Share an activity »](#)
[Actividades en Español »](#)

Search or Browse Teaching Activities

Results 1 - 10 of 410 matches

[Bouncing Ball Explorer](#) part of Teaching Computation with MATLAB:Past Workshops:MATLAB Workshop October 2022:Activities
Duncan Carlsmith, University of Wisconsin-Madison

Exploration of the sound of a bouncing ball dropped on a hard surface, the sound recorded with a mobile phone or laptop microphone, is the basis for an accessible experiment in elementary mechanics. For ...

[MATLAB Exemplary Collection](#)

[Measuring voting districts and distributions](#) part of Teaching Computation with MATLAB:Past Workshops:MATLAB Workshop 2024:Activities
Eugene Mahmoud, Mt San Antonio College

This project-based activity allows students to use MATLAB to analyze voting district boundaries and their relationship to social and environmental justice. Students recreate geographic borders, calculate centroids, ...

[MATLAB Exemplary Collection](#)

[Numerical Simulation Basics: Accuracy and Model Validation for a Finite-difference Equation](#) part of Teaching Computation with MATLAB:Past Workshops:MATLAB Workshop 2023:Activities
Jim Boyle, Western Connecticut State University

This activity teaches students a few of the basic concepts for numerical simulation of physical systems by modeling the simple and well-known problem of free-fall. The recursion relation for the finite-difference ...

[MATLAB Exemplary Collection](#)

[Wordle GUI Application](#) part of Teaching Computation with MATLAB:Past Workshops:MATLAB Workshop 2023:Activities
Sarah Patterson, Virginia Military Institute; Blain Patterson, Virginia Military Institute; Katherine Ritchey, Mount Union University

We will introduce a project in which students will use Matlab to create a Wordle game GUI application. In this project, students will need to complete a series of tasks in MATLAB such as data management, GUI ...

[Stress Map](#) part of Teaching Computation with MATLAB:Past Workshops:MATLAB Workshop 2024:Activities
James Conder, Southern Illinois University-Carbondale

Use earthquakes from the global CMT catalog to look at crustal stresses in a given region of the Earth. Students will download earthquake data from an online catalog and make tectonic maps. One map is of the ...

[MATLAB Exemplary Collection](#)

Refine the Results ↓

Subject

- Biology [35 matches](#)
- Chemistry [20 matches](#)
- Computer Science [31 matches](#)
- Engineering [185 matches](#)
- Environmental Science [35 matches](#)
- Geography [8 matches](#)
- Geoscience [94 matches](#)
- Health Sciences [18 matches](#)
- Mathematics [100 matches](#)
- Physics [38 matches](#)

Resource Type: Activities

- [88 matches](#) General/Other
- Problem Set [77 matches](#)
- Classroom Activity [172 matches](#)
- Lab Activity [156 matches](#)
- Project [198 matches](#)
- Field Activity [2 matches](#)
- Virtual Field Trip [2 matches](#)
- Writing Assignment [17 matches](#)

Location

- Cutting Edge [12 matches](#)
- GETIS [6 matches](#)
- Integrate [4 matches](#)
- MARGINS Data in the Classroom [2 matches](#)
- Quantitative Skills [2 matches](#)
- Starting Point-Teaching Entry Level Geoscience [3 matches](#)
- Starting Point: Teaching and Learning Economics [1 match](#)
- Teach the Earth [2 matches](#)
- Teaching Computation with MATLAB [277 matches](#)

Keynote Starting Soon

9/2026: *Maybe students don't need to learn math anymore* – Jensen

The study that triggered the question: The conversation referenced data showing that AI tools helped students raise homework scores, with lower exam scores and retention later.



*Hyperbole or
Our Future?*

Original Source:

9/23: *The Ezra Klein Show* podcast

Jensen Huang Thinks A.I. Alarmism Has Gone Too Far

Related:

9/29: *The Ezra Klein Show* podcast

Bill Gates's Blunt Warning on A.I.

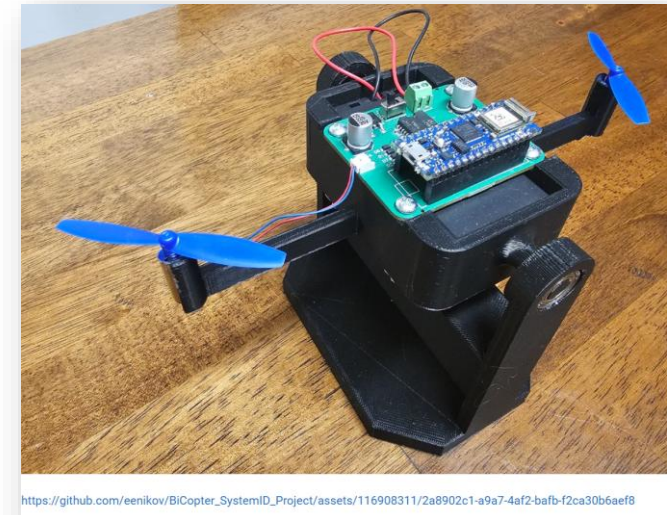
Action: 3 Things

Keynote

Teaching for the Future:
What will I do next?

- Trends in Education (and you!)
- GenAI and Agentic AI
- MATLAB Teaching Tools

Lisa Kempler, Lead Convener
MathWorks
October 25, 2026
lisak@mathworks.com



Question: *What Does Industry Want?*

Answer: Employees who know how to think and learn.
And use AI thoughtfully.

(Sorry, Jensen)

Project-Based Courses: Instruments, Robots, IoT and Data



MATLAB Help Center Community Learning

MATLAB Answers File Exchange Cody AI Chat Playground Discussions Contests Blogs Post More

Files Authors My File Exchange Publish About

Circuits

Electrical Circuits Virtual Lab
<https://github.com/zaliyazici/Circuits>

Zekeriya-Aliyazicioglu Dennis-Dahlquist Version 1.1.2 (12.1 MB) 1.1K Downloads
 ☆ 0.00/5 (0) 27 Oct 2021

Download Open in MATLAB Online Share Follow

Overview Files Version History Reviews (0) Discussions (0)

Electrical Circuits Virtual Lab

Goal is to design/implementation, testing, and verification Electric Circuit problems using MATLAB Simulink Simscape and Live Scripts to understand the concept better.

Module 1: Node Analysis

Use the node-voltage method to solve a circuit that containing resistors and independent and dependent current sources and voltage sources is connected between non-reference nodes. Providing background information, instructions, interactive tasks, examples, and exercises in Live Scripts and verifications in Simulink Simscape

Module 2: Mesh Analysis

Use the mesh-current method to solve a circuit for an arbitrary network containing resistors and independent and dependent voltage and current sources. Providing background information, instructions, interactive tasks, examples, and exercises in Live Scripts and verifications in Simulink Simscape

Module 3: Operational Amplifier circuits

Analyze inverting, non-inverting, summing, and differencing operational amplifier circuits in the time domain. Providing background information, instructions, interactive tasks, examples, and exercises in Live Scripts and verifications in Simulink Simscape

General Information
 Version 1.1.2 (12.1 MB)
[View License on GitHub](#)

MATLAB Release Compatibility
 Compatible with any release

Platform Compatibility
☒ Windows ☒ macOS ☒ Linux

ANNOUNCEMENT
Weekly Quizzes Have Arrived in Discussions!
 Looking for a quick way to test your MATLAB knowledge and learn...

MATLAB Answers File Exchange Cody AI Chat Playground Discussions Contests Blogs Post More

Files Authors My File Exchange Publish About

Arduino-based-bi-copter-experiments

This repository contains all documents (Simulink, Solid Works, Printed Circuit Board, and bill of materials) for constructing the Bi-Copter.
<https://github.com/eenikov/Arduino-based-bi-copter-experiments>

Enikov Version 1.0.0 (35.8 MB) 76 Downloads ☆ 0.00/5 (0) 16 Jul 2024

Overview Files Version History Reviews (0) Discussions (0)

System Identification and Control Design Experiments with the Arduino-Based Bi-Copter Hardware

Eniko T Enikov, University of Arizona

This project aims to demonstrate the use of MATLAB's system identification toolbox in developing dynamic models of an Arduino-Based aero-mechatronic system. The system is comprised of two propellers mounted on a pivoting arm, along with Arduino Nano 33 IoT and a battery pack. It is operated wirelessly via local WiFi network using MATLAB's Simulink Arduino support package. Except for the 3D printed arm and stand, all other components are commercially available, allowing easy replication of the experiment. Additionally, a Simscape model replicates the hardware-based experience for users who prefer virtual experimentation.

https://github.com/eenikov/BiCopter_SystemID_Project/assets/116908311/2a8902c1-a9a7-4af2-bafb-f2ca30b6aef8

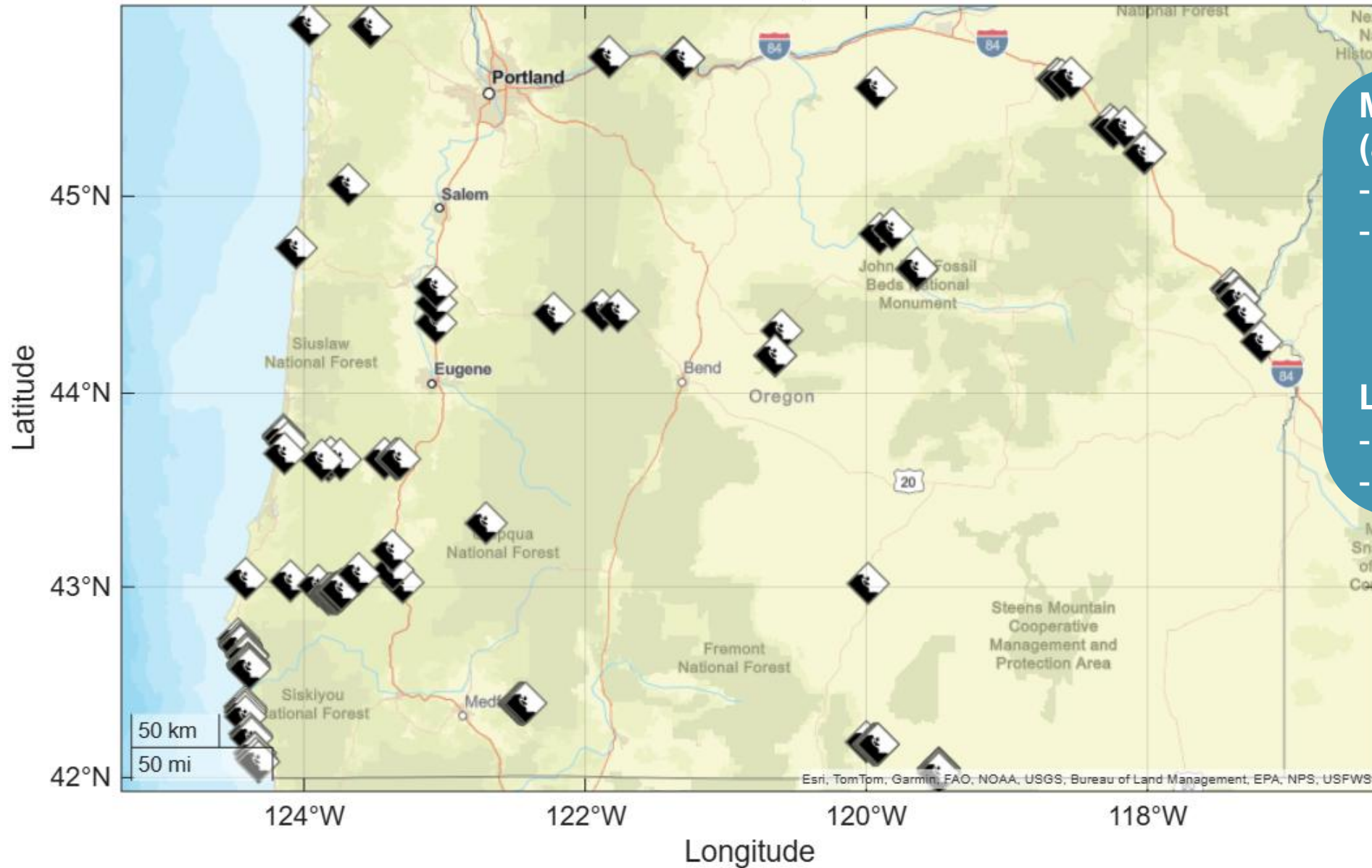
Educator: Glenn Thompson, USF
Artemis II launch reveals unique seismic activity captured by USF scientists

Activity: Students record seismic activity at NASA Kennedy Space Center



Oregon Landslides with Annual Cost > 1000 USD

Data: USGS/DOGAMI, Icon: NAPSG



Maps are cool
(and underutilized)

- New! Maps in R2026a
- Relevance: Auto, Aero, Geoscience, Government, etc.

Learning goals

- Real data experience
- Effective visualization

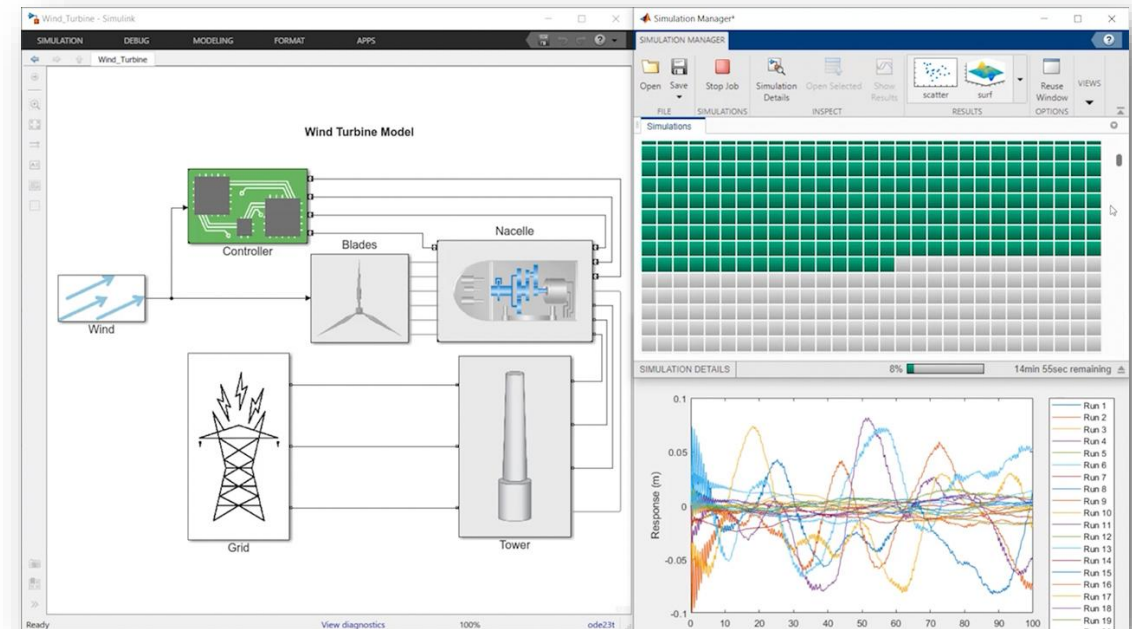
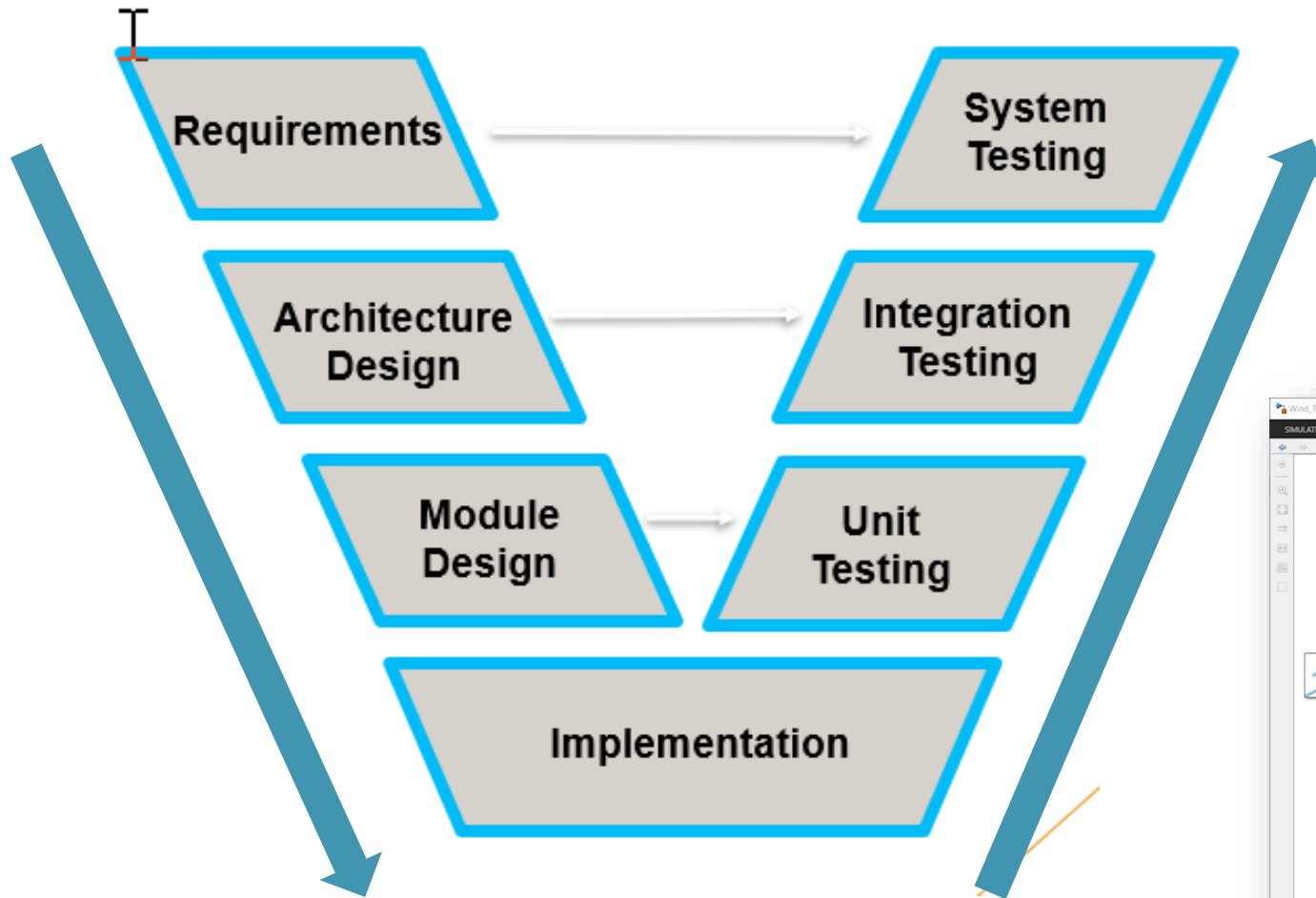
Interactive Textbook (Zybooks)

```
1 ConvertToKilo([100, 190, 163, 211])
```

Dan Burleson's 2019 Workshop Talk

Teaching to **The Design V** — Learning that Transfers to Industry

“Model-Based Design” (for Engineering and Science)

Trend # 4

Map Learning Objectives to Engineering Workflow:

Which Development Best Practices to Teach?

Category	Tools
Code Analysis	
	Code Analyzer / Profiler
	Coding Standards/Agentic Skills
Source Control/Git	
	MATLAB Projects, Dependency Analysis
Validation and Test	
	MATLAB Test/Simulink Test
	Simulink Requirements
	Hardware/Code Validation
Managed Projects and Releases	
	MATLAB Package Manager
	MATLAB Projects
Continuous Integration and Delivery	
	MATLAB Package Manager
	Integrations: Gitlab CI-CD/Jenkins/Azure Pipelines/GitHub Actions
	MATLAB Build Tool, MATLAB Test, Simulink Check, Docker Containers
Language Interfaces and Code Generation	
	Call Python, C, Excel from MATLAB
	Call MATLAB from Python, C, Excel
	MATLAB codegen: MATLAB apps, graphics
	C/C++ Code Gen: MATLAB Coder
	App Creation: MATLAB Compiler, Agentic AI

Power User

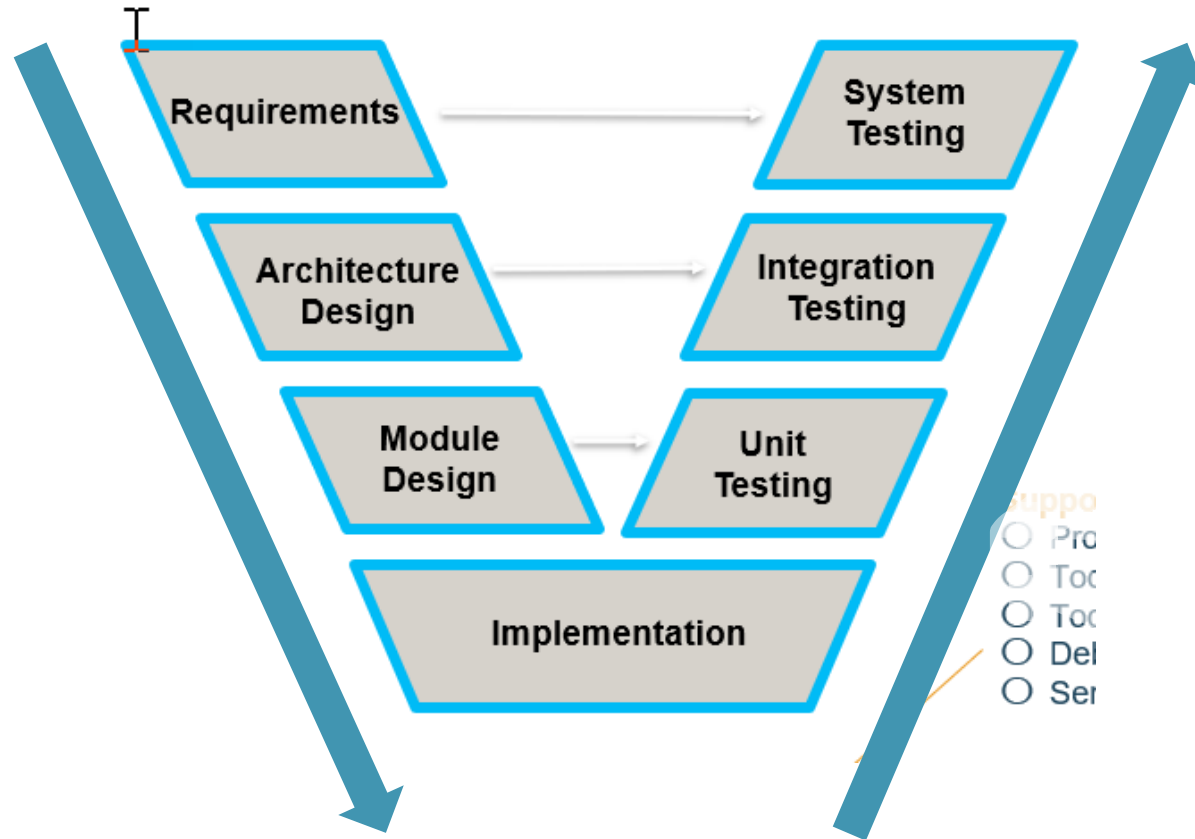
“Reluctant” Developer

Software Development Skills

Can Course and Capstone Projects Teach Design and Development Best Practices?



Industry expects graduates to integrate AI into the Design V

Trend # 5

- **Develop and Enforce requirements** in AI-supported development
- **Perform simulations** of AI-developed models before deployment
- **Test, Verify, and Validate (VV&T)** AI-supported system components
- **Integrate AI with physical systems** and real-time H/W (HIL)

Your Interests

- “modeling” – 34
- “simulation” – 18
- “Simulink” – 10
- “Simscape” – 10
- “robot” – 2
- “Arduino” – 2

Cool Attracts Students!

Educators Must Balance Cool with Desired Outcomes and Reality



Learning
goals



Measurable
Outcomes



ABET
Accreditation



Industry –
Job prospects



Viability
(cost, time, fit)



What else?

#1 Guiding Principle in Backwards Curriculum Design

And, thus, in this Educator Workshop

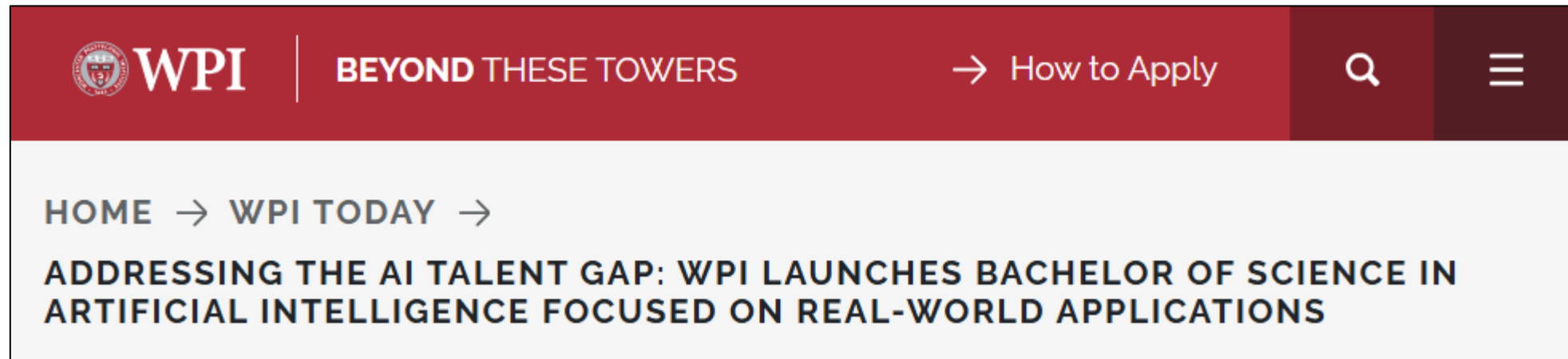
Biggest Trend:

AI – GenAI and Agentic AI

Trends

- 1) Industry skills fit
- 2) Project-Based Learning
- 3) Interactive, Cloud-based Learning
- 4) Model-Based Development/Design V
- 5) AI

News: Worcester Polytech Introduces Bachelor of Science in AI – Focus on Real-World Applications



■ Educators



Dr. Xiao
RBE Head

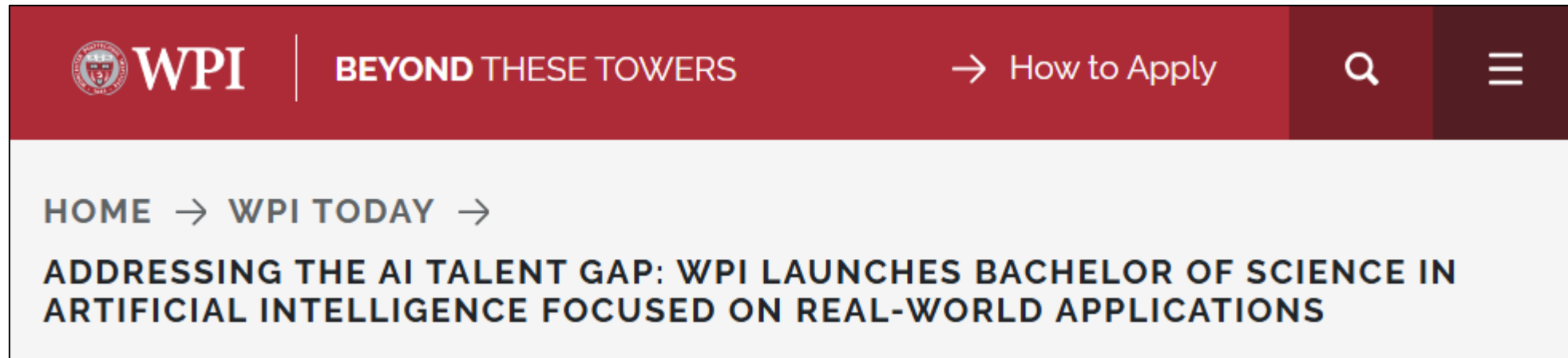


Dr. Agehli
PBL Fellow and faculty lead



WPI

Problem: New WPI Robotics Lab Must Support Many More Students

**WPI**

- **Educator pain**



Dr.Xiao, RBE Head



Dr.Agehli, PBL Fellow
and faculty lead

Limited lab space and hardware to go around as we anticipate significant influx of undergrads taking the robotics concentration from the AI program. **How do we efficiently manage student time?**

Solution: WPI Robotics Labs + **Agentic AI** Built Digital Twin Robot (with MATLAB, Simulink and Simscape)

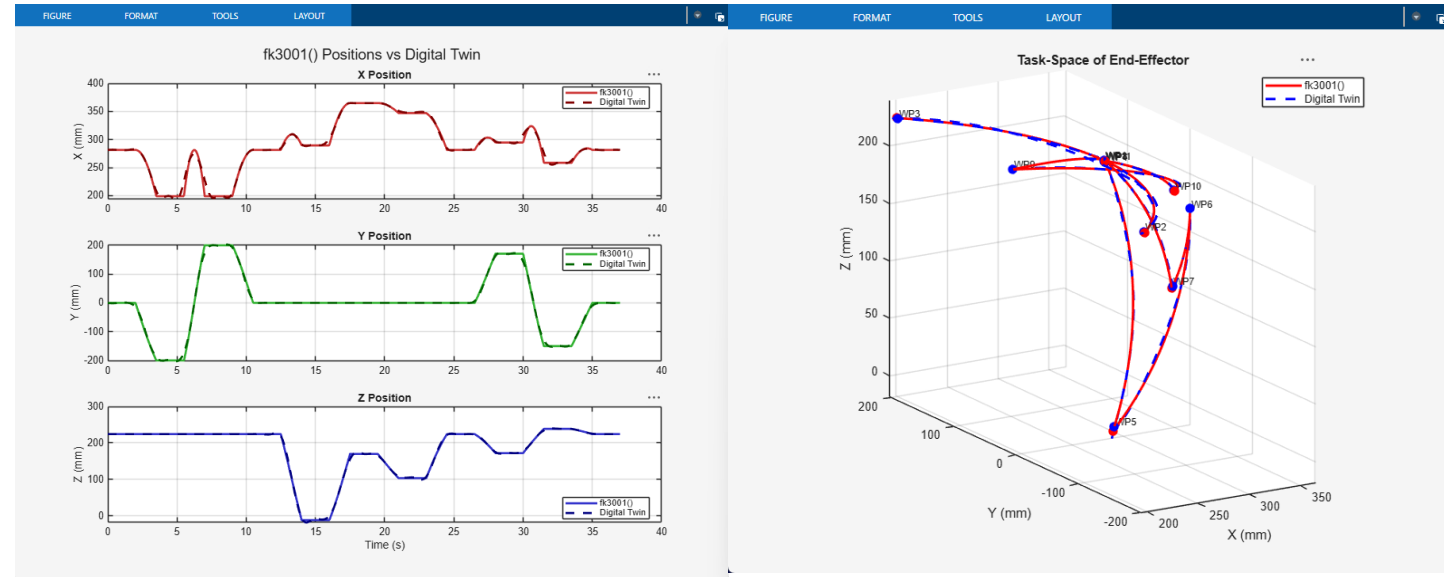
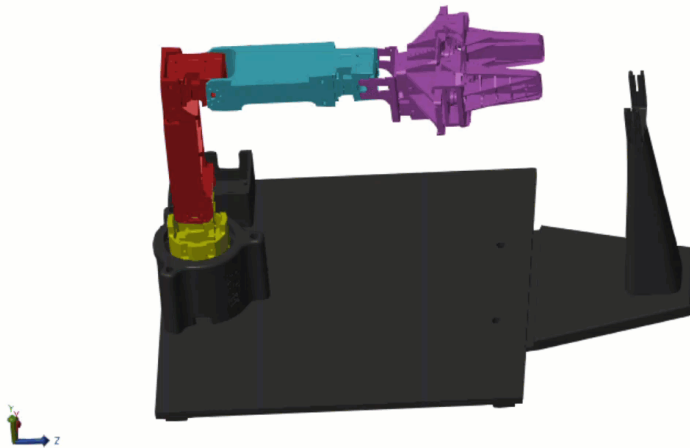


WPI

Next:
Virtual Robotic Arm for
remote students

■ Solution

- Students use new **digital twin of robot** to design and iterate on labs and final project
 - No waiting their turn to debug in the lab



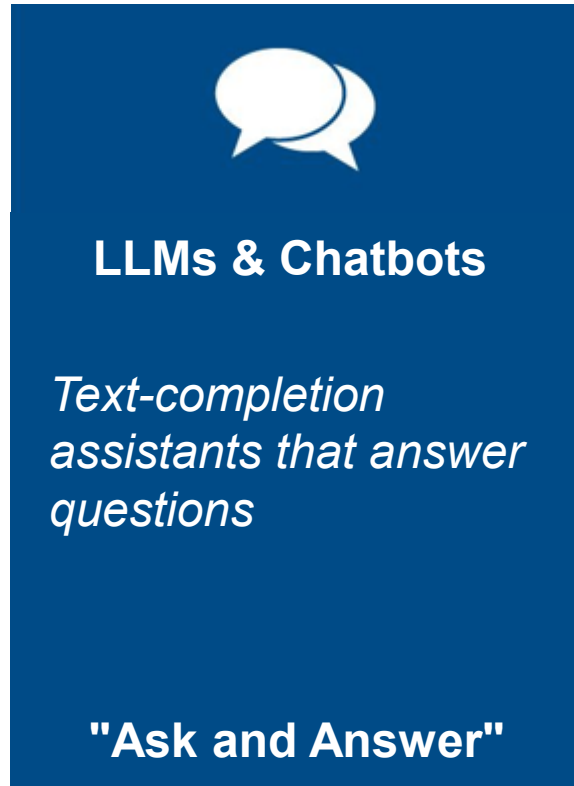
■ Tools

- **Simulink Agentic Toolkit** created the Simscape digital twin and lab assessments
 - From current course materials

• Impact

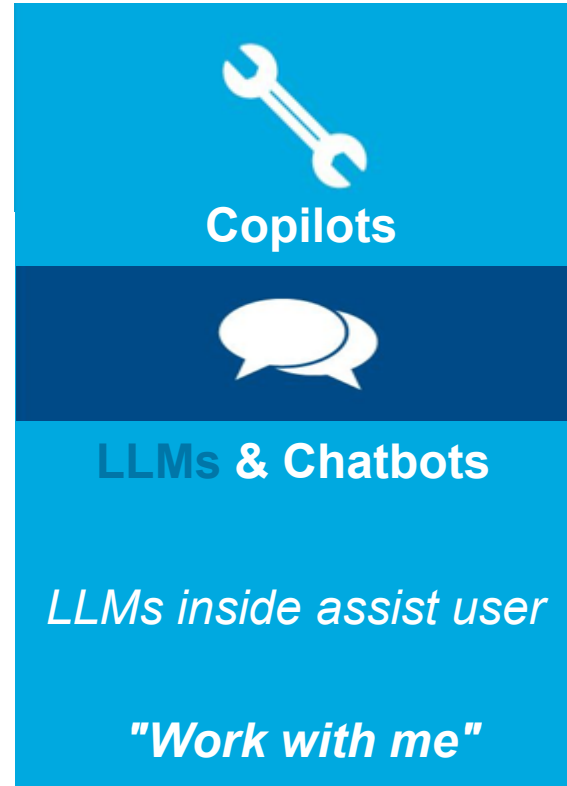
- Time to develop curriculum reduced from 1 year to 3 months → 85 students all set

Tools Framework: Power Progression of GenAI/Agentic AI Systems



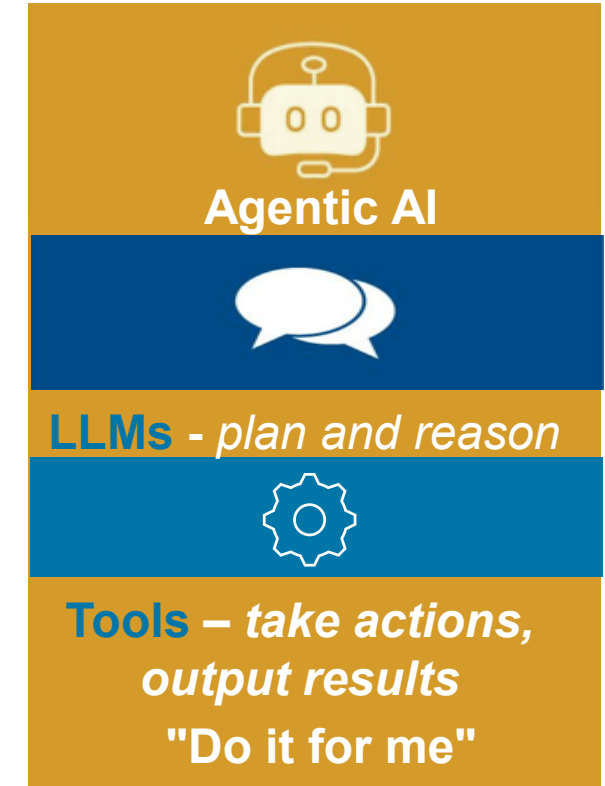
 ChatGPT


 Claude


 Google Gemini


 MATLAB Copilot


 Simulink Copilot


 GitHub Copilot


 Gemini CLI


 Open AI Codex


 Claude Code

Poll Break:

How are you using GenAI in your classroom?

(serial show of hands)

- 0) I don't allow GenAI use in my course.
- 1) I don't explicitly use GenAI in my course, but students can opt to use it.
- 2) Course incorporates GenAI explicitly (when+how to use, or not)

Prof. Warren du Plessis, University of Pretoria

2 Courses: He wanted to fix the assignments.

▪ Initially, GenAI made it worse

- Students used GenAI for their homework project, with 0 guidance → Frustration, Time

Unintended outcomes

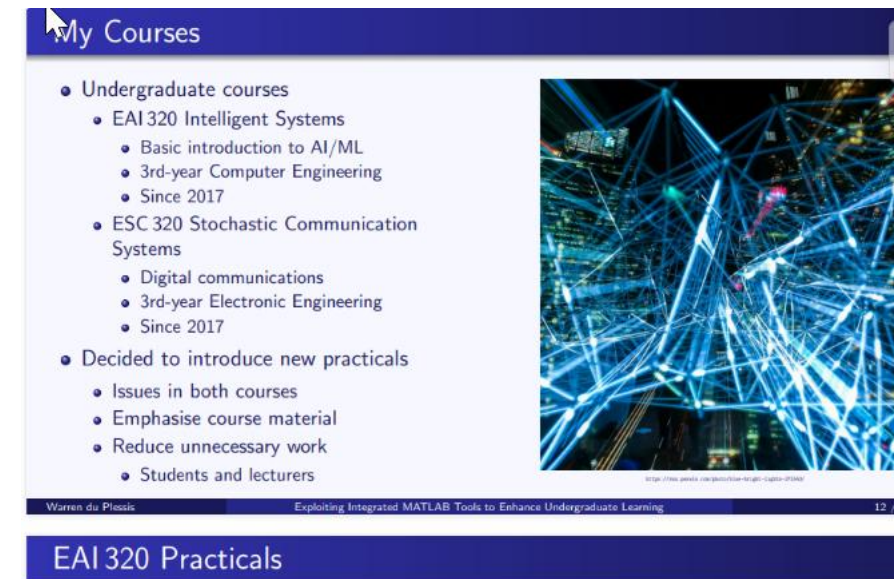
- *Brute forces solutions: Hack until it works*
- *Solution too trivial – simplest acceptable answer*
- *Too elaborate*
- *Increases student workload:*
 - *Actual code and coding task must match*

▪ Next: Professor provides clear GenAI guidance

- Outcome: Faster, learn more, code → homework # 2

▪ Make guidance clear!

- When to use it, for what, output
- Include what **not** to do, describe pitfalls

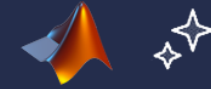


Cheatsheet + Guidance: [APMA – Programming with MATLAB, UVA](#)

MATLAB Copilot

AI-Powered Assistance for Faster MATLAB Development

"MATLAB Copilot provides generative AI-powered capabilities specifically for the MATLAB desktop environment. It assists with MATLAB workflows and provides responses based on MATLAB specific information." - MathWorks



1. Chat with Copilot

PROS

- ✓ Documentation-grounded responses
- ✓ Reduces hallucinations vs. LLMs
- ✓ Supports iterative refinement

CONS

- ✗ May give surface-level answers
- ✗ MATLAB ecosystem only
- ✗ All responses need manual validation

BEST FOR: Exploring MATLAB concepts & getting quick answers

4. Get Error Explanations

PROS

- ✓ Translates cryptic error messages
- ✓ Reduces external doc searching
- ✓ Integrated directly into workflow

CONS

- ✗ May misdiagnose complex errors
- ✗ Reactive, not preventative
- ✗ Misses logical/algorithmic flaws

BEST FOR: Debugging & understanding error messages

2. Generate / Modify Code

PROS

- ✓ Natural language → MATLAB code
- ✓ Accelerates prototyping
- ✓ Works in Editor & Live Editor

CONS

- ✗ Code must be reviewed & tested
- ✗ Limited project-level context

BEST FOR: Speeding up repetitive coding tasks

3. Get Code Explanations

PROS

- ✓ Generates high-level file summaries
- ✓ Faster onboarding to projects
- ✓ Links explanations to docs context

CONS

- ✗ No static code analysis
- ✗ May misread programmer intent

BEST FOR: Building a structured testing workflow

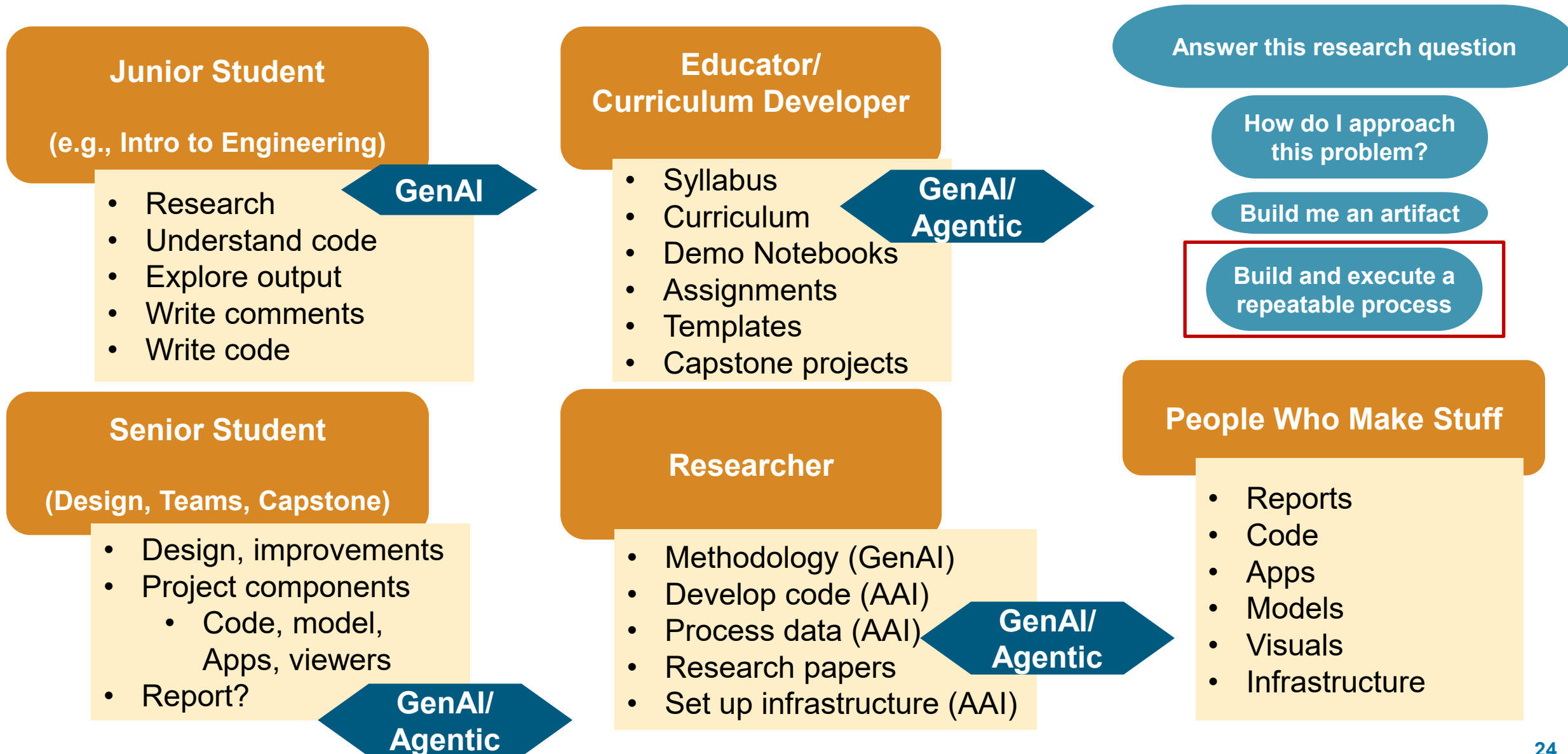
From Final Project

Extra Credit #2 (optional): submit a 150-200 word reflection on how your group used MATLAB Copilot while developing your solar system simulation. Briefly discuss:

- What things Copilot helped with (code structure, debugging, fns, viz, tests)
- 1 useful Copilot suggestion and how you check that it is correct.
- One incomplete, incorrect, or unclear suggestion and how you revised

Be specific. Explain how you evaluate Copilot's output (not full Copilot history) Submit this reflection as a separate PDF document inside your final project.

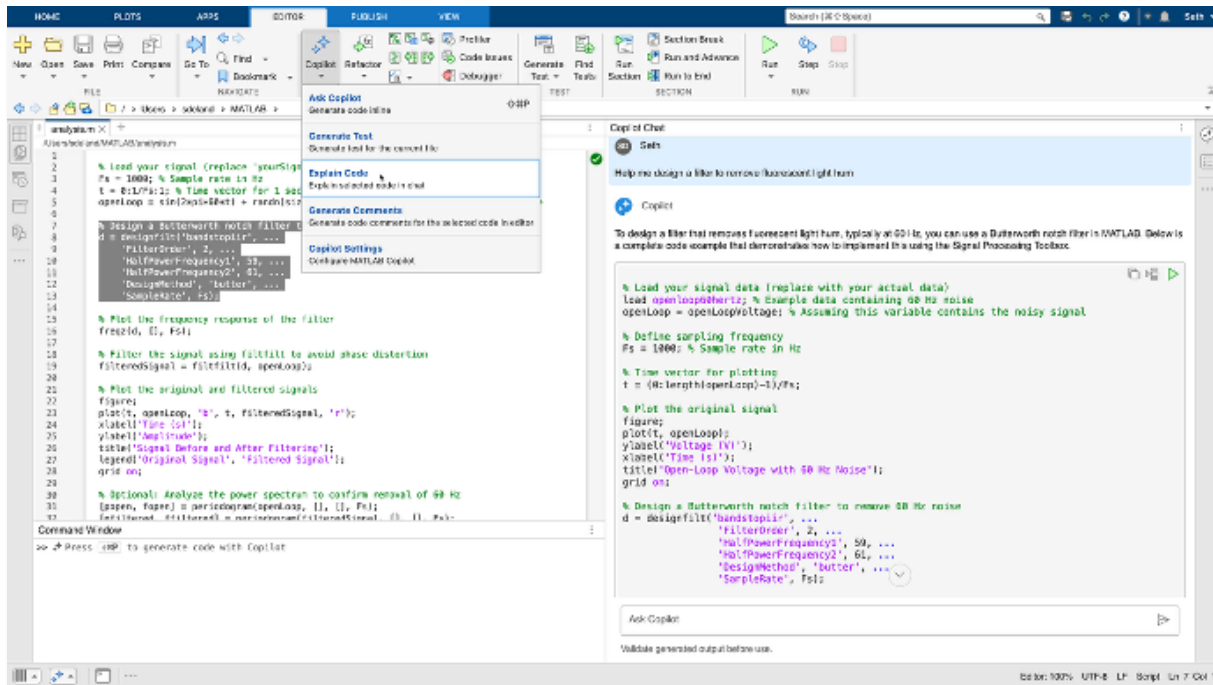
GenAI and Agentic AI Uses and Roles – *By Whom and For What?*



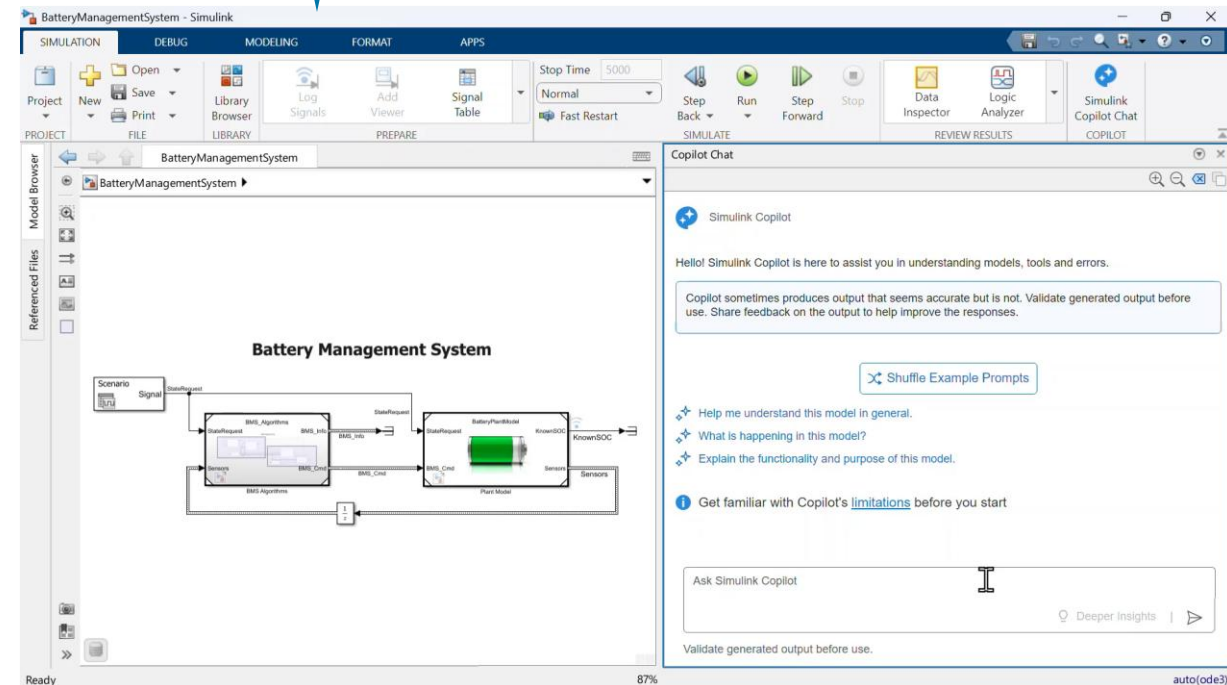
Part of Core MATLAB: MATLAB Copilot, Simulink Copilot



MATLAB Copilot



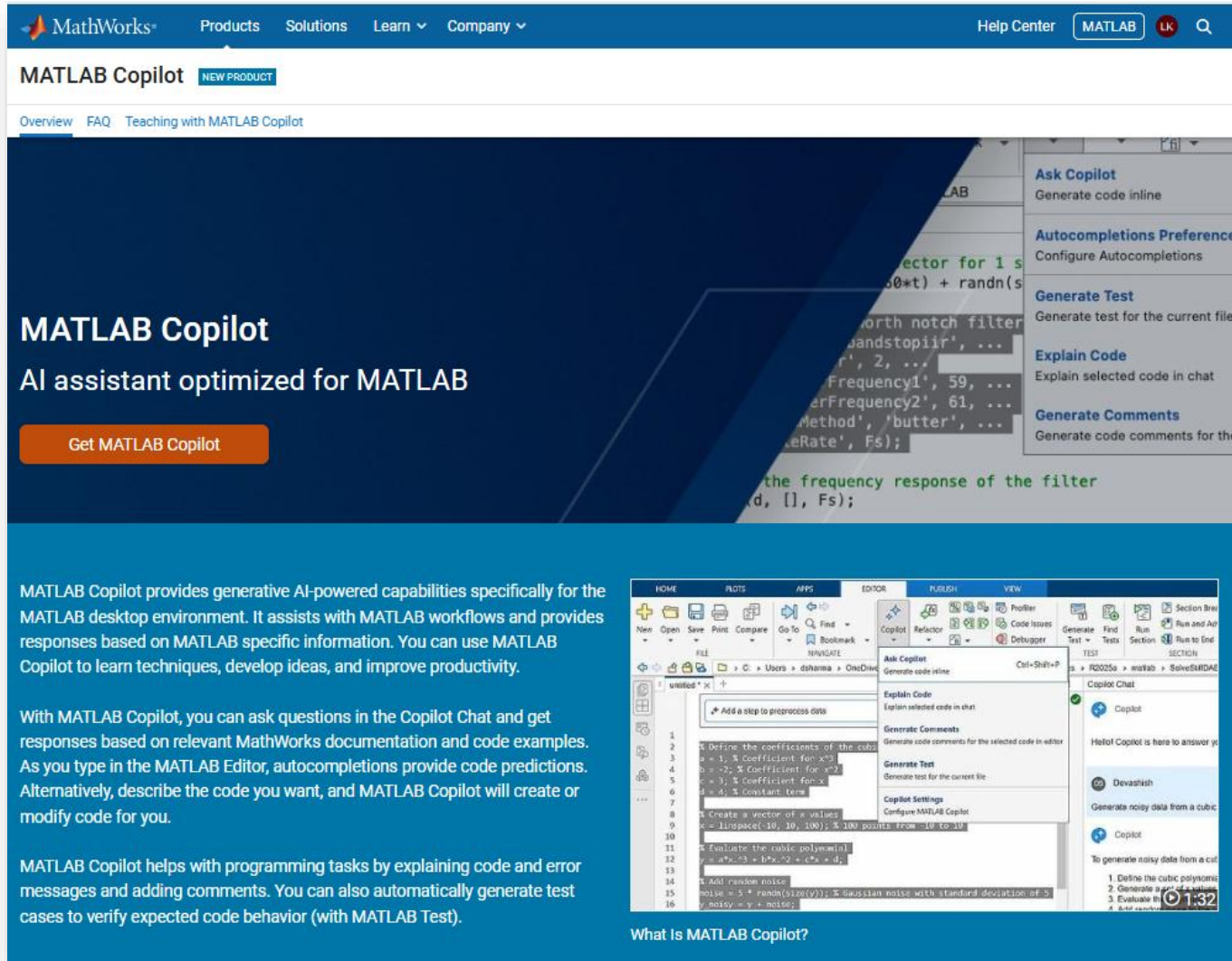
Simulink Copilot



Released
R2025a,
R2026a

MATLAB Copilot and Simulink Copilot are included in Campus-Wide access to MATLAB and Simulink

GenAI in MATLAB: MATLAB Copilot



The image shows a screenshot of the MATLAB Copilot website and a MATLAB editor interface. The website header includes the MathWorks logo, navigation links (Products, Solutions, Learn, Company), a Help Center link, and a MATLAB button. The main heading is "MATLAB Copilot" with a "NEW PRODUCT" tag. Below it are links for "Overview", "FAQ", and "Teaching with MATLAB Copilot". The main content area features the text "MATLAB Copilot" and "AI assistant optimized for MATLAB", followed by a "Get MATLAB Copilot" button. To the right, a sidebar lists features: "Ask Copilot" (Generate code inline), "Autocompletions Preferences" (Configure Autocompletions), "Generate Test" (Generate test for the current file), "Explain Code" (Explain selected code in chat), and "Generate Comments" (Generate code comments for the selected code). The bottom section of the website describes MATLAB Copilot's capabilities: "MATLAB Copilot provides generative AI-powered capabilities specifically for the MATLAB desktop environment. It assists with MATLAB workflows and provides responses based on MATLAB specific information. You can use MATLAB Copilot to learn techniques, develop ideas, and improve productivity. With MATLAB Copilot, you can ask questions in the Copilot Chat and get responses based on relevant MathWorks documentation and code examples. As you type in the MATLAB Editor, autocompletions provide code predictions. Alternatively, describe the code you want, and MATLAB Copilot will create or modify code for you. MATLAB Copilot helps with programming tasks by explaining code and error messages and adding comments. You can also automatically generate test cases to verify expected code behavior (with MATLAB Test)." Below this text is a screenshot of the MATLAB editor interface showing a code file with MATLAB Copilot suggestions and a sidebar with the same feature list as the website. The code in the editor includes comments and MATLAB code for generating a vector, evaluating a cubic polynomial, and adding random noise.

MATLAB Copilot provides generative AI-powered capabilities specifically for the MATLAB desktop environment. It assists with MATLAB workflows and provides responses based on MATLAB specific information. You can use MATLAB Copilot to learn techniques, develop ideas, and improve productivity.

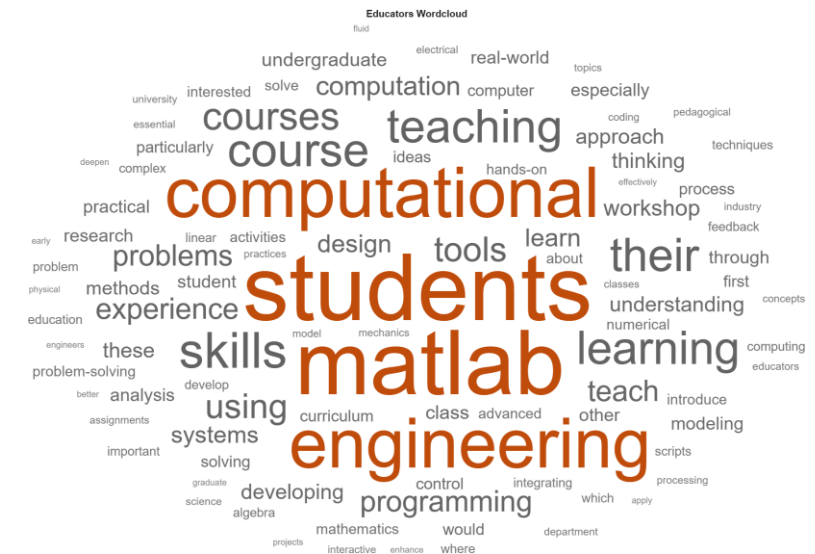
With MATLAB Copilot, you can ask questions in the Copilot Chat and get responses based on relevant MathWorks documentation and code examples. As you type in the MATLAB Editor, autocompletions provide code predictions. Alternatively, describe the code you want, and MATLAB Copilot will create or modify code for you.

MATLAB Copilot helps with programming tasks by explaining code and error messages and adding comments. You can also automatically generate test cases to verify expected code behavior (with MATLAB Test).

What is MATLAB Copilot?

Poll Break - ???

DEMO?



Summary: MATLAB Copilot integrates GenAI into MATLAB

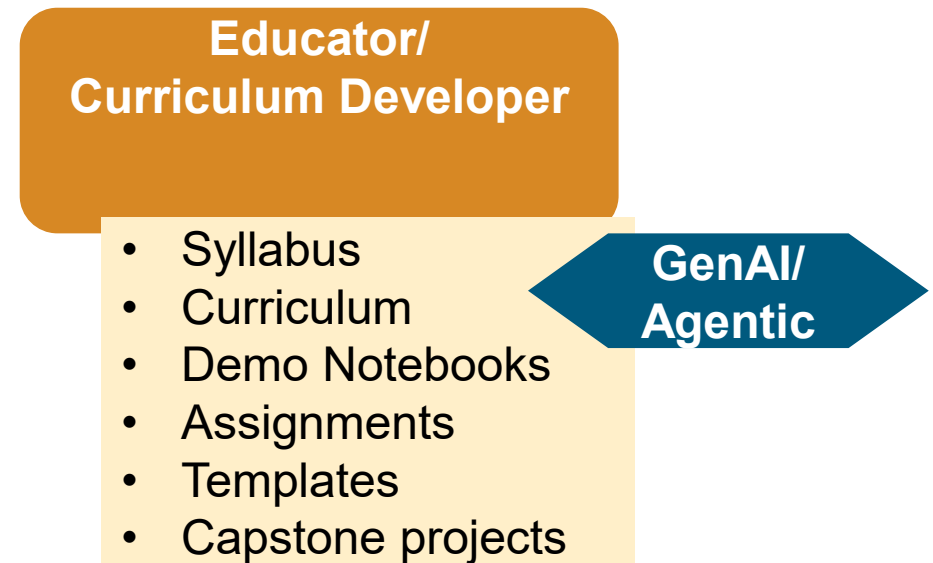
The screenshot displays the MATLAB Copilot interface, which integrates GenAI into the MATLAB environment. The interface is divided into several key components:

- Editor:** The main workspace for writing MATLAB code. It shows a file named `analysis.m` with the following code:

```
1 % Load your signal (replace 'yourSignal' with actual data)
2 Fs = 1000; % Sample rate in Hz
3 t = 0:1/Fs:1; % Time vector for 1 second
4 openLoop = sin(2*pi*60*t) + rand(size(t));
5
6 % Design a Butterworth notch filter to remove 60 Hz noise
7 d = designfilt('bandstopiir', 'FilterOrder', 2, 'HalfPowerFrequency1', 59, 'HalfPowerFrequency2', 61, 'DesignMethod', 'butter', 'SampleRate', Fs);
8
9 % Plot the frequency response of the filter
10 freqz(d, [], Fs);
11
12 % Filter the signal using filtfilt to avoid phase distortion
13 filteredSignal = filtfilt(d, openLoop);
14
15 % Plot the original and filtered signals
16 figure;
17 plot(t, openLoop, 'b', t, filteredSignal, 'r');
18 xlabel('Time (s)');
19 ylabel('Amplitude');
20 title('Signal Before and After Filtering');
21 legend('Original Signal', 'Filtered Signal');
22 grid on;
23
24 % Optional: Analyze the power spectrum to confirm removal of 60 Hz
25 [popen, fopen] = periodogram(openLoop, [], [], Fs);
26 [pfiltered, ffiltered] = periodogram(filteredSignal, [], [], Fs);
```
- Copilot Actions:** A menu in the Editor that provides various actions for the selected code. The actions include:
 - Ask Copilot:** Generate code inline.
 - Generate Test:** Generate test for the current file.
 - Explain Code:** Explain selected code in chat.
 - Generate Comments:** Generate code comments for the selected code in editor.
 - Copilot Settings:** Configure MATLAB Copilot.
- Copilot Chat:** A chat window where users can interact with the Copilot. It shows a conversation with a user named Seth asking for help designing a filter to remove fluorescent light hum. The Copilot responds with a detailed explanation and a complete code example that demonstrates how to implement this using the Signal Processing Toolbox.
- Copilot in the Editor:** A prompt in the Command Window that encourages users to generate code with Copilot.

The interface also includes a search bar at the top right, a toolbar with various icons, and a status bar at the bottom showing the editor's settings (100% zoom, UTF-8 encoding, LF line endings, Script file type, Line 7, Column 1).

Educator Persona and GenAI/Agentic AI



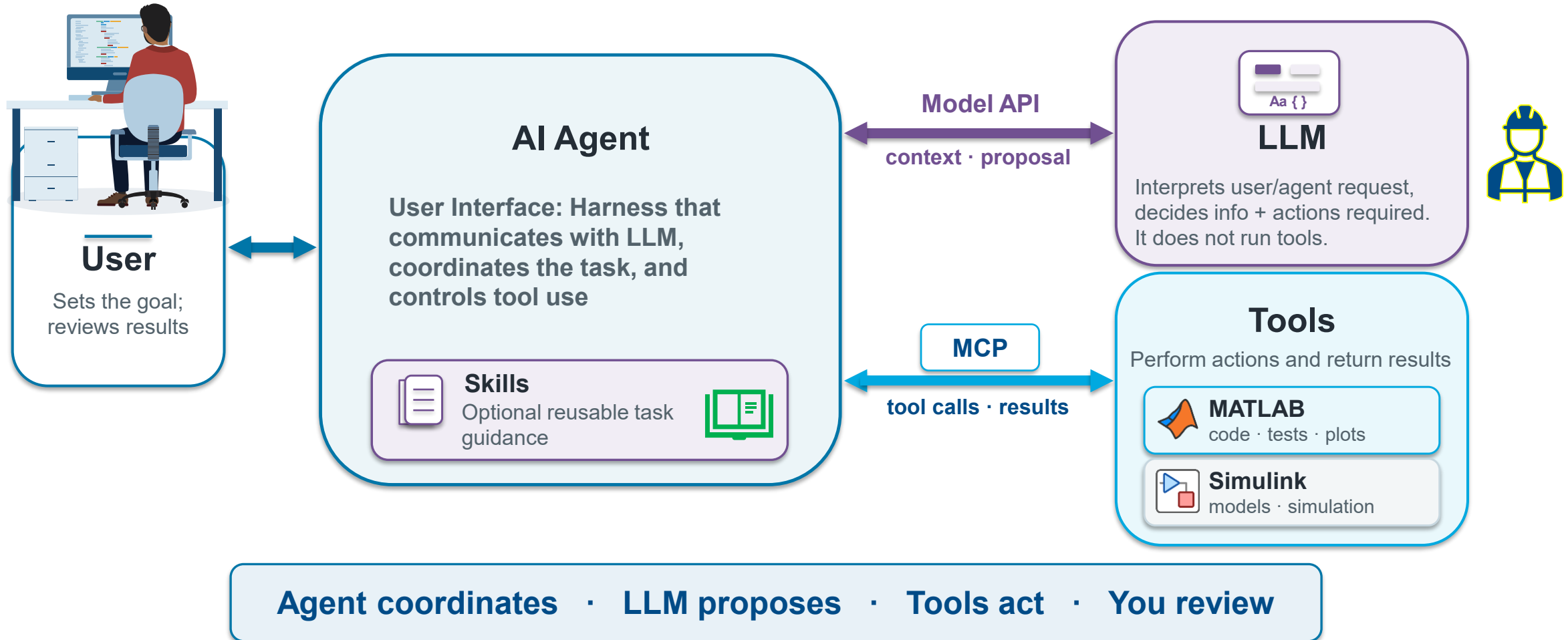
Agentic AI

Terminology:
Agent? LLM? Tool? Skill?

It's a lot.

Making the extra effort makes all the difference –
productivity, usable results – a reasonable partner.

Agentic AI: Mental Model



Agentic **Skills**: Sharable packages of instructions, scripts, and resources to give agents specialized capabilities + domain expertise

150 Skills
(Files)

in MATLAB Agentic Toolkit!

GenAI > matlab-agentic-toolkit > skills-catalog > matlab-core >

Sort

View

...

☐ Name	Status	Date modified
matlab-create-live-script		
matlab-debugging	✓	6/3/2026 6
matlab-install-products	✓	6/3/2026 6
matlab-list-products	✓	6/3/2026 6
matlab-review-code	✓	6/3/2026 6
matlab-testing	✓	6/3/2026 6
plugin.yaml	✓	6/3/2026 5

Live Scripts

Plain-text `.m` files that render as rich documents in the MATLAB Live Editor. Version-control friendly – never use binary `.mlx`.

When to Use

- Tutorials, reports, analysis notebooks, or documentation
- Interactive exploration with inline figures and equations
- Version-controlled content (plain-text `.m`, not binary `.mlx`)

When NOT to Use

- Regular scripts without rich formatting
- Function files
- MATLAB older than R2025a

Rules

- Text lines use `%[text]` – NOT bare `%`
- One paragraph = one `%[text]` line – do not hard-wrap; let the Live Editor handle line width
- No empty `%[text]` lines – they render as unwanted blank space
- Section headers: `%%` on its own line, then `%[text] ## Title` on next line
- No blank lines anywhere in the file
- No `figure` command – implicit figure creation only
- No more than one plot per section (unless using tiled layouts)
- No `close all` or `clear`
- Double all LaTeX backslashes: `\\sin`, `\\frac`, `\\sum`
- Last bulleted list item ends with `\\`
- Every file ends with the required appendix
- Avoid `fprintf` – drop the semicolon or use `disp()` for output
- Outputs should serve the reader's understanding, not verify execution – run the script via MCP to confirm correctness

Required Appendix

Agentic AI with MATLAB:

Teaching Signal Analysis via a MATLAB App (that an agent made)

Ask of Codex: Create a Signal Analysis Live Script/App Simulator

DEMO

- Option # 1: Reference the MATLAB Documentation Examples
 - [Signal Generation and Visualization](#)
 - [Label Signal Attributes ROI and Points](#) (Signal Labeler App)
 - Copy and paste code from the doc example
- Option # 2: Create a Live Script with Agentic AI (Codex)
 - 1 Prompt → Working MATLAB app (`SignalGenTeachingApp.m`)

Prompt # 1

I am an educator teaching an engineering instrumentation course. I want to model for the students how to interact with and control a device.

Create a live script that interacts with a signal generator – a software simulation – using UI controls that allow the students to control the output of the signal generator. Display an animation of the signal as it updates

Creating Course Materials

**Educator/
Curriculum Developer**

- Syllabus
- Curriculum
- Demo Notebooks
- Assignments
- Templates
- Capstone projects

**GenAI/
Agentic**

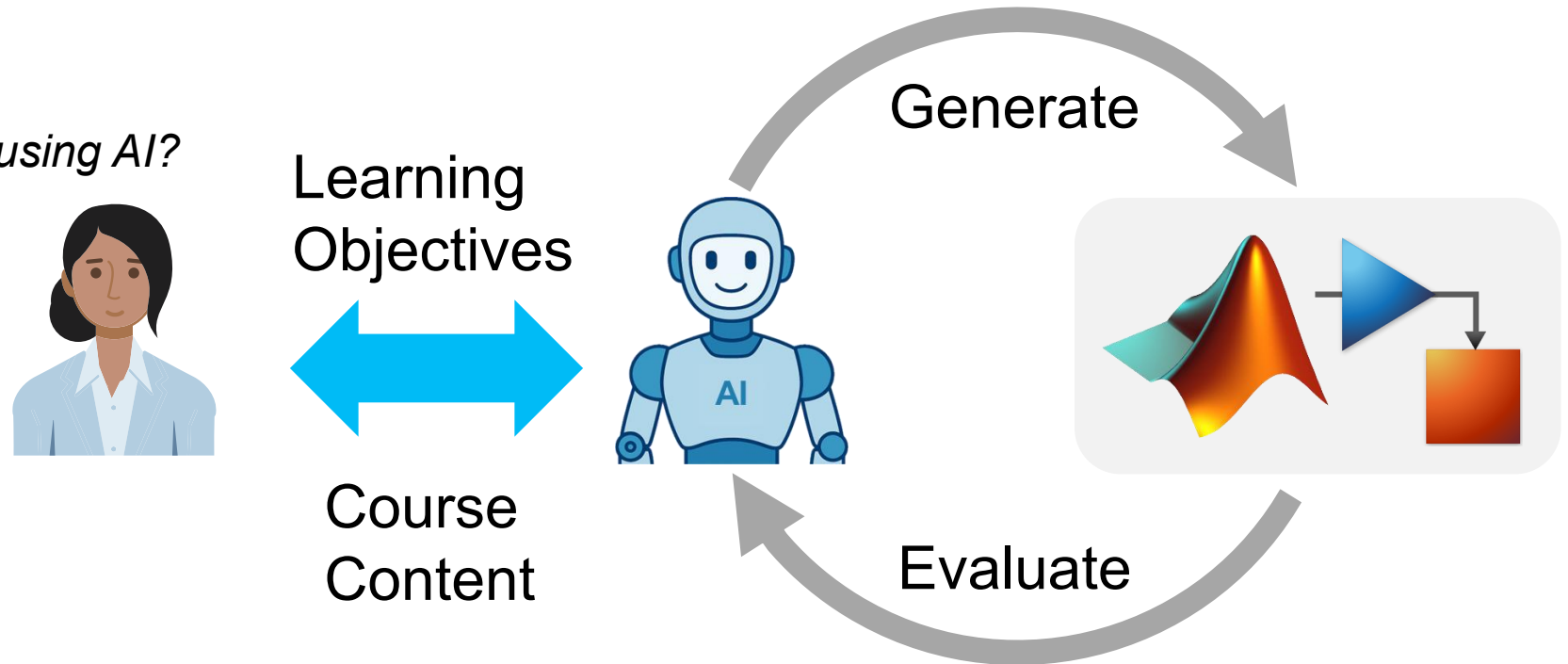
Example: Creating MATLAB Course Content with an AI Partner for input into Course Designer or MATLAB Grader

Problem

How do I align course content and assessments to learning objectives using AI?

Solution

- 1) Collect and document your current materials, ideas, and learning objectives.
- 2) Use an Agent for creation, review, execution, and test
- 3) Review, then input into Course Designer



Goal

Create one lesson or entire course with learning content and assessments, packaged for import into my LMS

Example: Creating MATLAB Course Content (Agent + Course Designer)

Agent creates a compact MATLAB-only module with reading, practice, and a MATLAB Exercise – artifacts ready to input and implement in MATLAB Course Designer (with educator review)

Vector Orientation in MATLAB

Course Purpose

This compact module introduces students to MATLAB vector operations and how they can distinguish row and column vectors.

Audience

First-year engineering students taking a MATLAB course.

Prerequisites

- Basic MATLAB commands
- Numeric arrays using MATLAB
- Awareness that semicolons separate rows in MATLAB

Required Product

- MATLAB

Module

1. Identify and Transpose MATLAB Vectors

- Reading: Vector Orientation
- Practice: Predict Shapes Based on MATLAB Vectors
- MATLAB Exercise: Vector Orientation

Persistence Note

Common Cartridge export handles the export of the module into the target LMS. The exercise instructions, and in some cases, the MATLAB code, are stored in the LMS.

Reading: Vector Orientation in MATLAB

MATLAB stores vectors as arrays. A vector has size 1-by-n, such as `[3; 5; 8]`. The number of elements in the vector changes how the vector is stored in memory.

Use `isrow(v)` to check whether `v` is a row vector. Use `iscolumn(v)` to check whether `v` is a column vector.

MATLAB has two transpose operators. The `'` operator changes rows into columns and columns into rows. The `.'` operator changes rows into columns and columns into rows, but it does not change the orientation of the vector. The conjugate transpose operator `'` changes rows into columns and columns into rows, but it does not change the orientation of the vector.

In this introductory module, we will focus on the `'` operator.

Examples:

```
rowVec = [2 4 6];
colVec = [2; 4; 6];

isrow(rowVec)
iscolumn(colVec)

colFromRow = rowVec.';
rowFromCol = colVec.';
```

After the transpose operation, `rowFromCol` is a row vector and `colFromRow` is a column vector.

Practice: Running MATLAB Code

For each line, predict the output of the code. Then run the code in MATLAB to verify your prediction.

```
a = [10 20 30 40];
b = [10; 20; 30; 40];
c = a.';
d = b.';
e = c.';
```

Record the size of each variable in the table below.

Variable	Size
a	
b	
c	
d	
e	

If a prediction is wrong, click on the variable name in the table to see the MATLAB code and the output.

Module 01 Activity 03: Vector Orientation and Transpose

Course Designer Placement

- Module: Identify and Transpose MATLAB Vectors
- Learning activity order: 3
- Learning activity type: MATLAB Exercise

Objective Alignment

- Course objective: Students will be able to identify row and column vectors in MATLAB and use transpose operations to convert between them.
- Module objective: Distinguish row and column vector orientation and use `'` to convert between orientations.

Learner Task

Students complete a MATLAB script that identifies row and column vectors, creates transposed copies, and applies the same operations to a second randomized data set.

MATLAB Exercise Component Source

The shared MATLAB Grader-style component files are in `grader-items/module-01-activity-03-vector-orientation-and-transpose/`.

Course Designer Authoring Fields

- Background file: `background.m`
- Task file: `task.m`
- Estimated time: 20 minutes
- Prerequisite context: MATLAB script editing, numeric arrays, row separators, semicolons
- Learner setup notes: MATLAB only; no additional toolboxes

MATLAB Teaching Tools: Where They Fit in the Course Flow

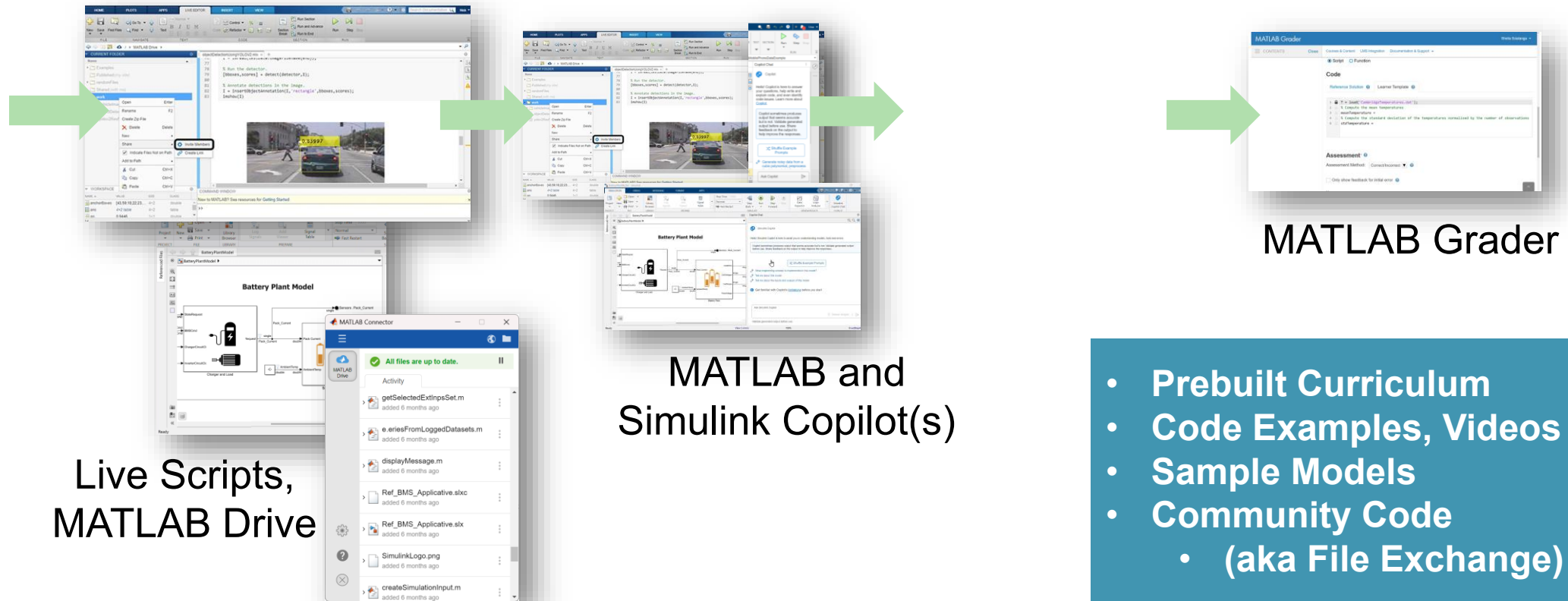
Getting Started

Application Software

In-Tool GenAI

DIY Course Guides

Auto-Grading



MATLAB Grader

- Prebuilt Curriculum
- Code Examples, Videos
- Sample Models
- Community Code
 - (aka File Exchange)

MATLAB Onramps and Training: Learn MATLAB Capabilities (FREE)



MATLAB Onramp

3% | 2 hours | [Share Certificate & Progress](#) | [Share Course](#)

[View all my courses](#)

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Course	24
✓ Onramp (Introductory Course)	24

Using MATLAB

All MATLAB	4
Get Started with MATLAB	1
Language Fundamentals	1
Programming	1
App Building	1

Using Simulink

All Simulink	9
Get Started with Simulink	4
Modeling and Simulation	1
Physical Modeling	6
Event-Based Modeling	1

Applications & Workflows

AI, Data Science, and Statistics	6
Control Systems	2
Classification	1

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[Results 1 - 10 of 24](#)

New to MATLAB? Start here:

MATLAB Onramp

3% | 2 hours | [Languages](#)

Get started quickly with the basics of MATLAB.

New to Simulink? Start here:

Simulink Onramp

2 hours | [Languages](#)

Get started quickly with the basics of Simulink.

Machine Learning Onramp

2 hours | [Languages](#)

Learn the basics of practical machine learning methods for class

Image Processing Onramp

2 hours | [Languages](#)

Learn the basics of practical image processing techniques in MATLAB.

Visualization in MATLAB

LEARNING PATH: 3 COURSES

Master creating and customizing 2D and 3D plots and gain fine control over your visualizations.

Power Systems Simulation Onramp

1.5 hours | [Languages](#)

Learn how to progressively build and validate power systems using Simscape Electrical.

NEW

Signal Classification with Deep Learning

1 hour | [Languages](#)

Learn the workflow for classifying signals with deep networks.

100+ Self-Paced Courses to Learn from

Students upload completion certificates to LMS

MATLAB Teaching Tools: Where They Fit in the Course Flow

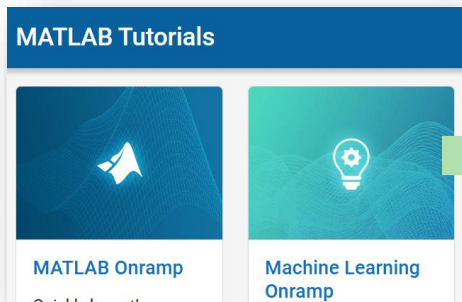
Getting Started

Application Software

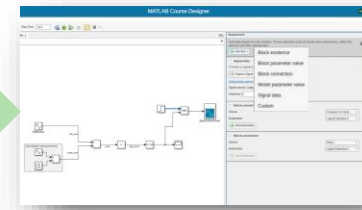
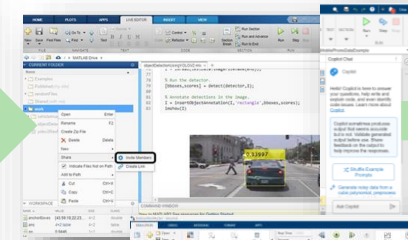
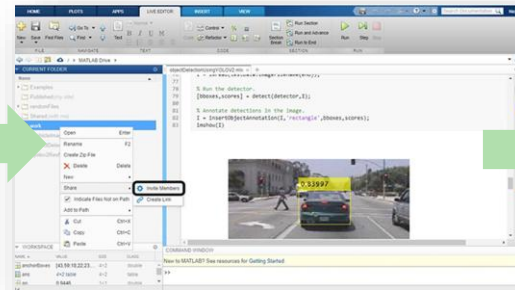
In-Tool GenAI

DIY Course Guides

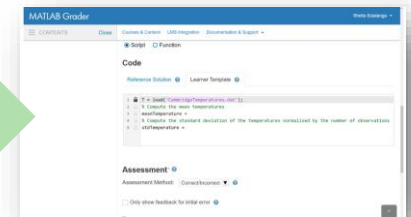
Auto-Grading



MATLAB Onramps

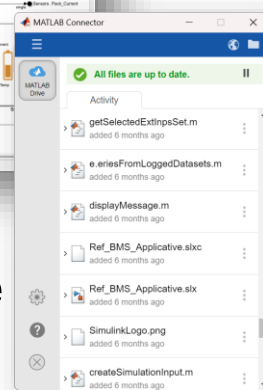


Course Designer



MATLAB Grader

Live Scripts,
MATLAB Drive



MATLAB and
Simulink Copilot(s)

- Prebuilt Curriculum
- Code Examples, Videos
- Sample Models
- Community Code
 - (aka File Exchange)

MATLAB Online + MATLAB Drive

Sunday: Settling In and Zeroing in on Goals

Teaching Activity Submission

Teaching Activity Peer Review

Prework

1-on-1 Mentoring Sessions

WORKSHOP BEGINS – Sunday 5-8 (CDT)

Intro and Ice Breakers

Talk: Teaching and Learning:
Which Experiments Will I Try?

Convener Panel

Networking

We Are Here

ACTION:

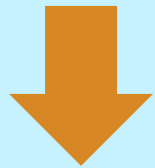
- Find the Program on the SERC site now.
- Spend a minute reviewing it.

Educator Talks + MATLAB Tools → Curriculum Work

MONDAY

(Completed)
SUNDAY

**Orientation and
Networking**



**Practical
Considerations for
Teaching
Computation**

Invited Educator Talks (Kelly Roos)
Activity: Breakouts (best practices)

Learning Outcomes (Michele McColgan)
Activity: Breakouts

MATLAB Teaching Tools Demo and Practice (Nirav, Evan)

Invited Educator Talks (Kelly Roos)
Activity: Breakouts (assessing student learning)

Assessment of Learning Outcomes (Ben Bratton)
Activity: Breakouts

Worktime: Upgrading Your Curriculum (Dan Burleson)

- Attributes of an exemplary teaching activity
- Affinity working group and feedback
- Individual work time: Teaching Activity/Module Development

Roadcheck (fill out survey)



Tuesday: Upgrade Courses → Share Course Plan → Feedback

TUESDAY

Sunday
Orientation and
Networking

....

Monday
MATLAB Tools
Deep Dive
+
Curriculum
Development

Intro

Upgrading Your Curriculum, Part 2 (Dan Burleson)
Activity: Individual Time + Groups

Teaching Activity Sharing and Feedback
Activity: Working group activity sharing and feedback

Workshop Synthesis and Next Steps

Workshop Evaluation (fill out survey)

Teaching Activity post-review updates



Convenor Panel



Help yourself to dessert and coffee
and get your questions ready

