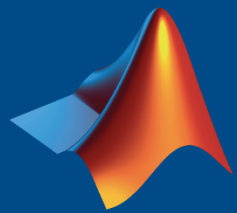
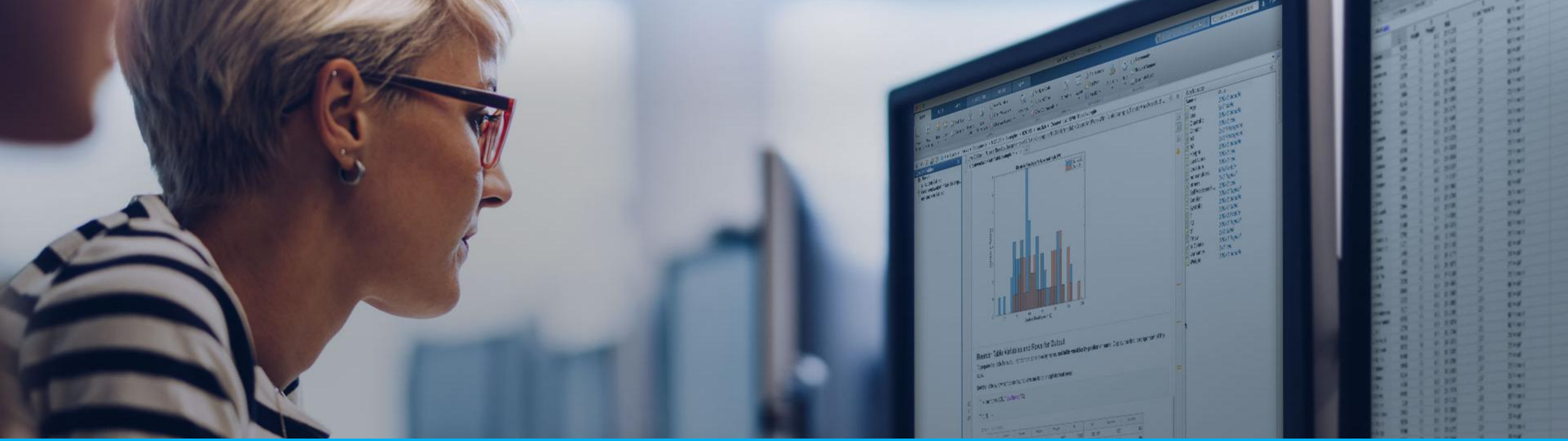


Hands-On Workshop: Introduction to MATLAB

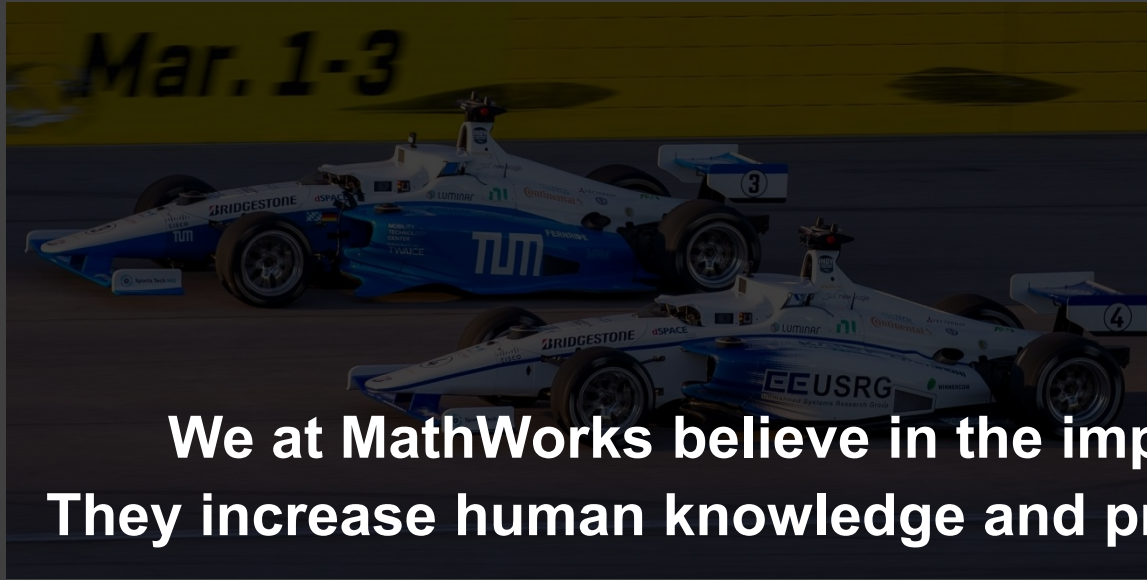
Yueyi Xu
Education Customer Success Engineer
yueyixu@mathworks.com



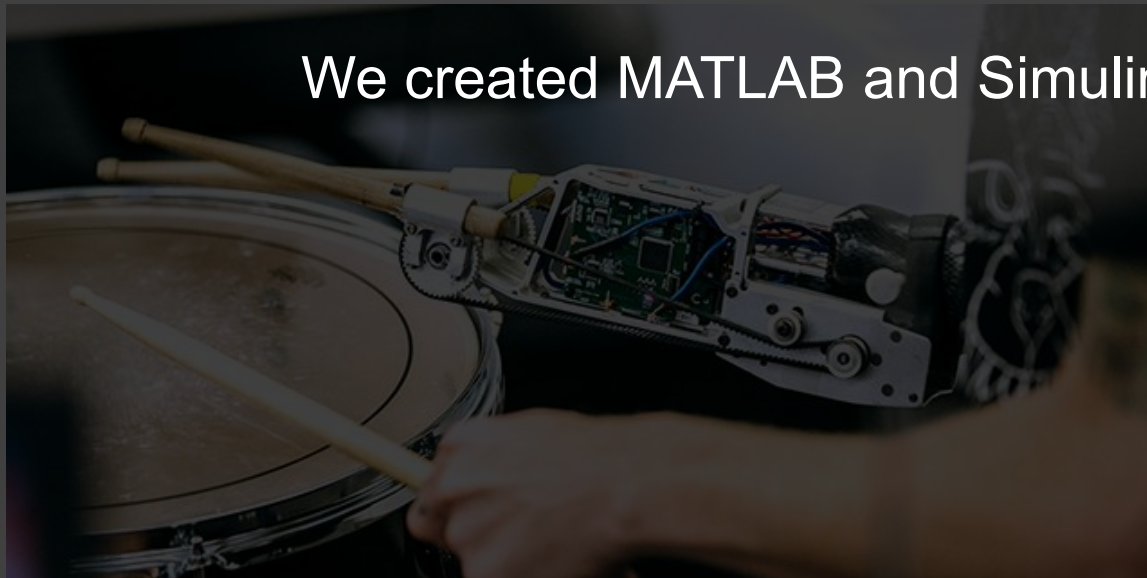
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Accelerating the pace of engineering and science

The leading developer of mathematical computing software
for engineers and scientists.



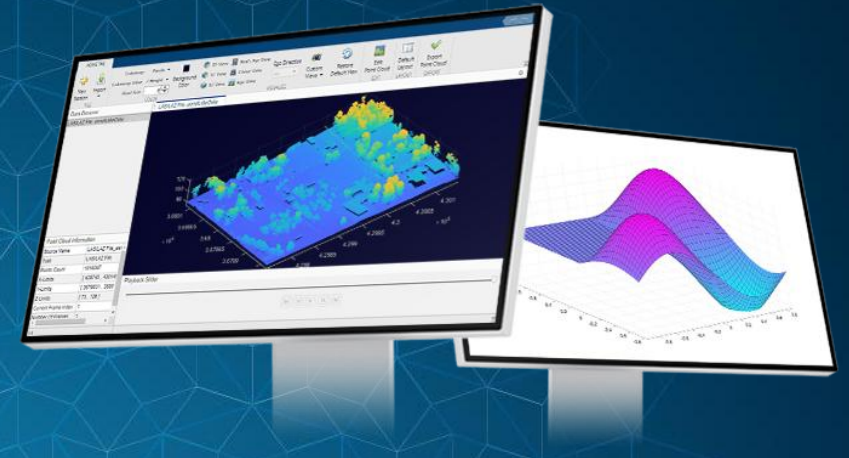
**We at MathWorks believe in the importance of engineers and scientists.
They increase human knowledge and profoundly improve our standard of living.**



We created MATLAB and Simulink to help them do their best work.

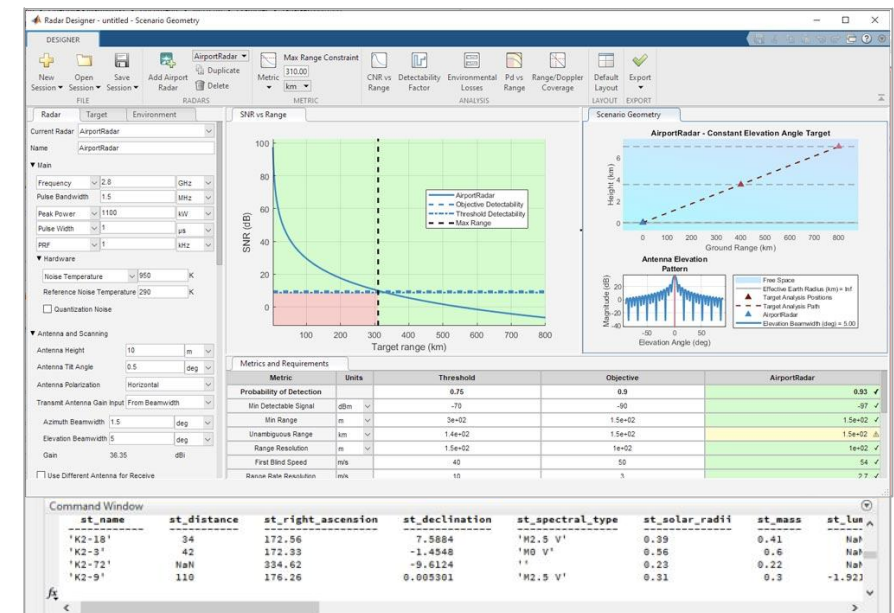


MATLAB® & SIMULINK®



- **MATLAB** – Programming environment for algorithm development, data analysis, visualization, and numeric computation.
- **Simulink** – Block diagram environment for simulation and Model-Based Design of multidomain and embedded engineering systems.
- **130+ add-on products** for specialized tasks.

Radar Toolbox



Our Customers / Key Industries



Aerospace and Defense



Automotive



Biological Sciences



Biotech and Pharmaceutical



Communications



Electronics



Energy Production



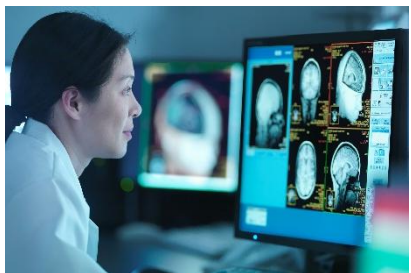
Financial Services



Industrial Machinery



Medical Devices



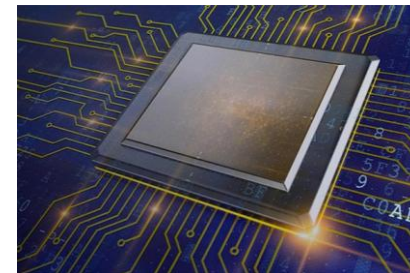
Neuroscience



Process Industries



Railway Systems



Semiconductors



Software and Internet

Our Customers / Engineered Systems



Autonomous and Connected Vehicles



Electric Cars and Aircraft



Marine Vehicles



Manufacturing Machinery



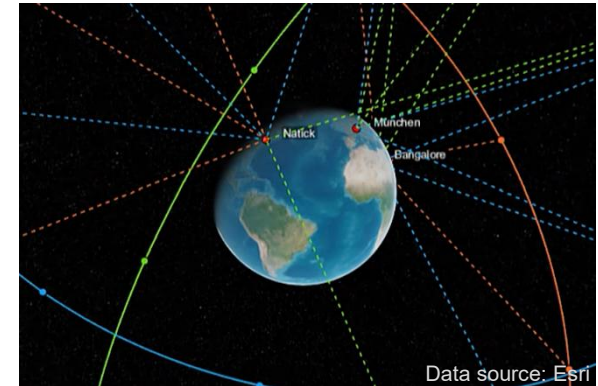
Renewable Power Generation Machines



Smart Medical Devices



Spacecraft

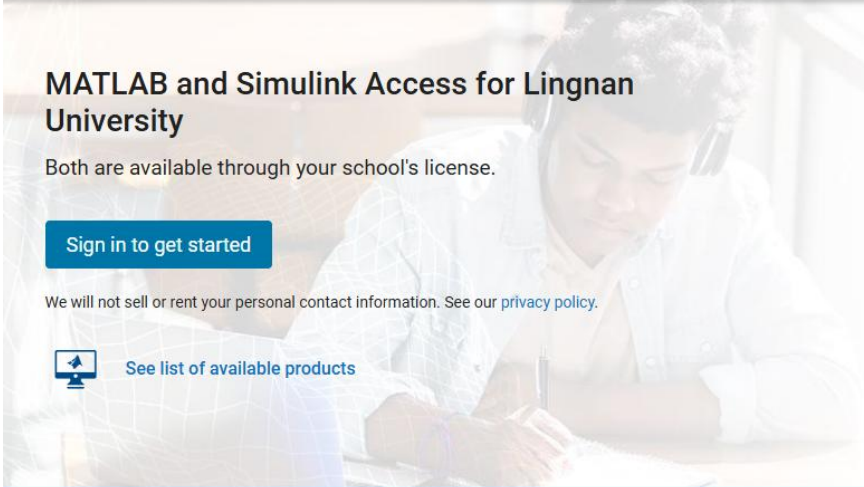


Wireless Networks

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Lingnan University



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100,000+
companies, from market leaders to startups, use MATLAB and Simulink



4 million+
MATLAB and Simulink references in research citations



82%
of Fortune 500 companies use MATLAB and Simulink



5 million+
MATLAB and Simulink users worldwide

<https://ww2.mathworks.cn/en/academia/tah-portal/lingnan-university-31715373.html>

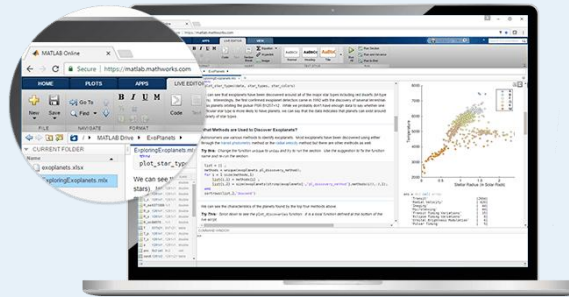
Campus Wide License

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



MATLAB for Desktops

Access MATLAB on personal and university-owned machines



MATLAB Online

Access MATLAB with a web browser



MATLAB Mobile

Access MATLAB on iOS/Android devices

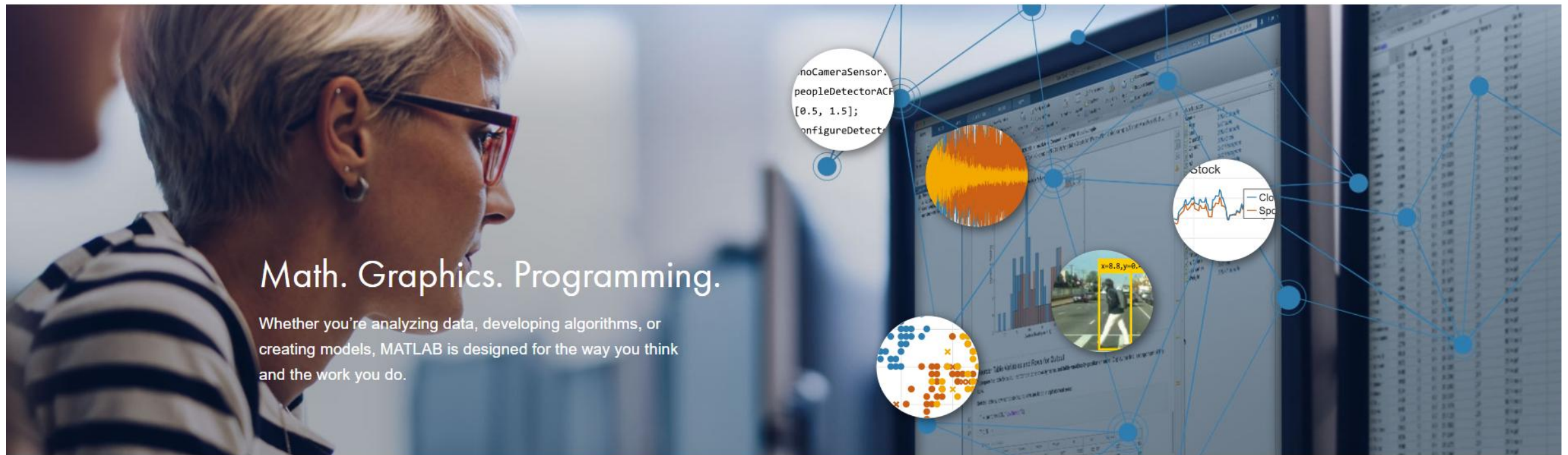
Visit your university MATLAB portal

Visit matlab.mathworks.com



What is MATLAB?

Why MATLAB?



Math. Graphics. Programming.

Whether you're analyzing data, developing algorithms, or creating models, MATLAB is designed for the way you think and the work you do.

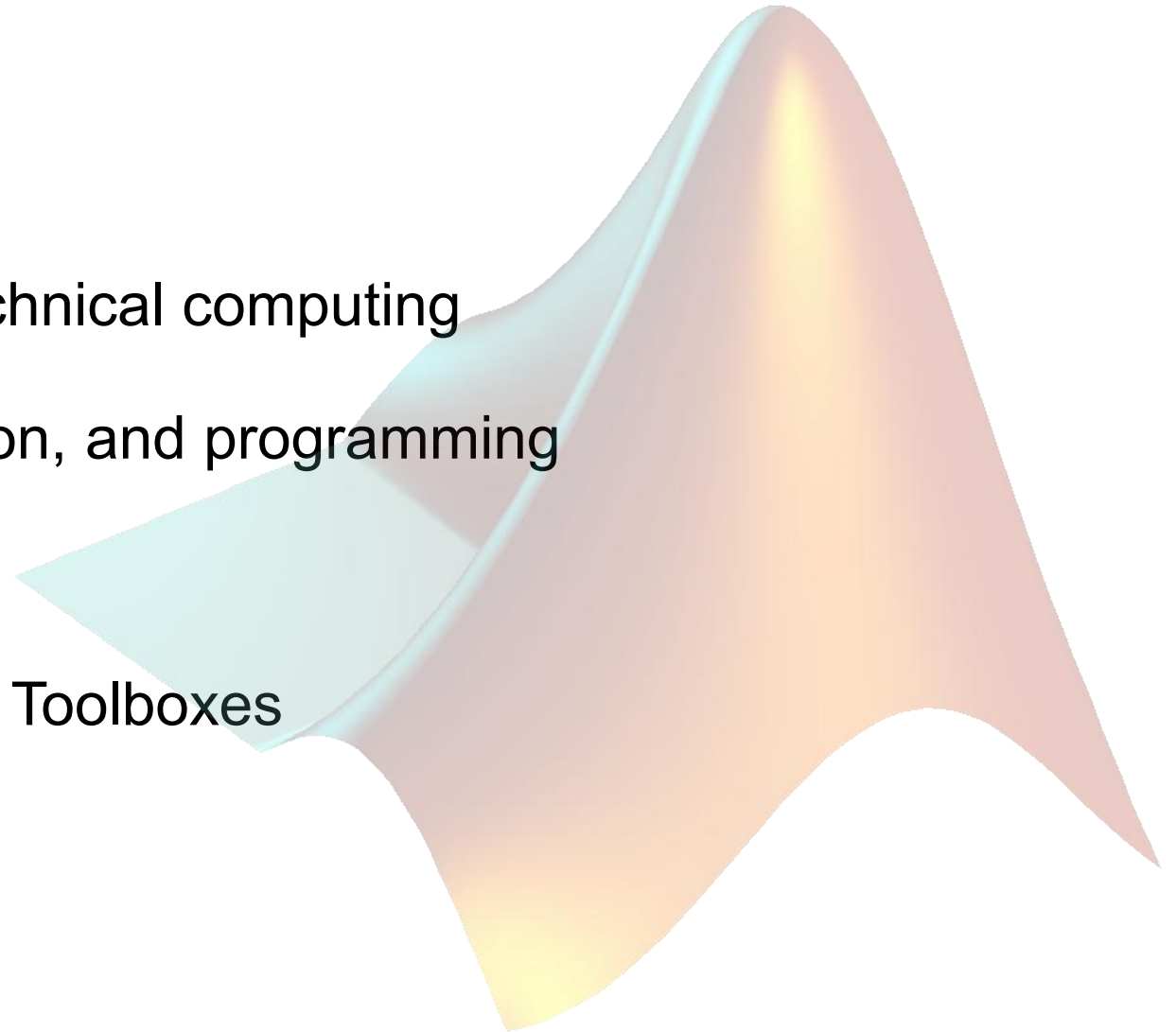
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configureDetect

Stock

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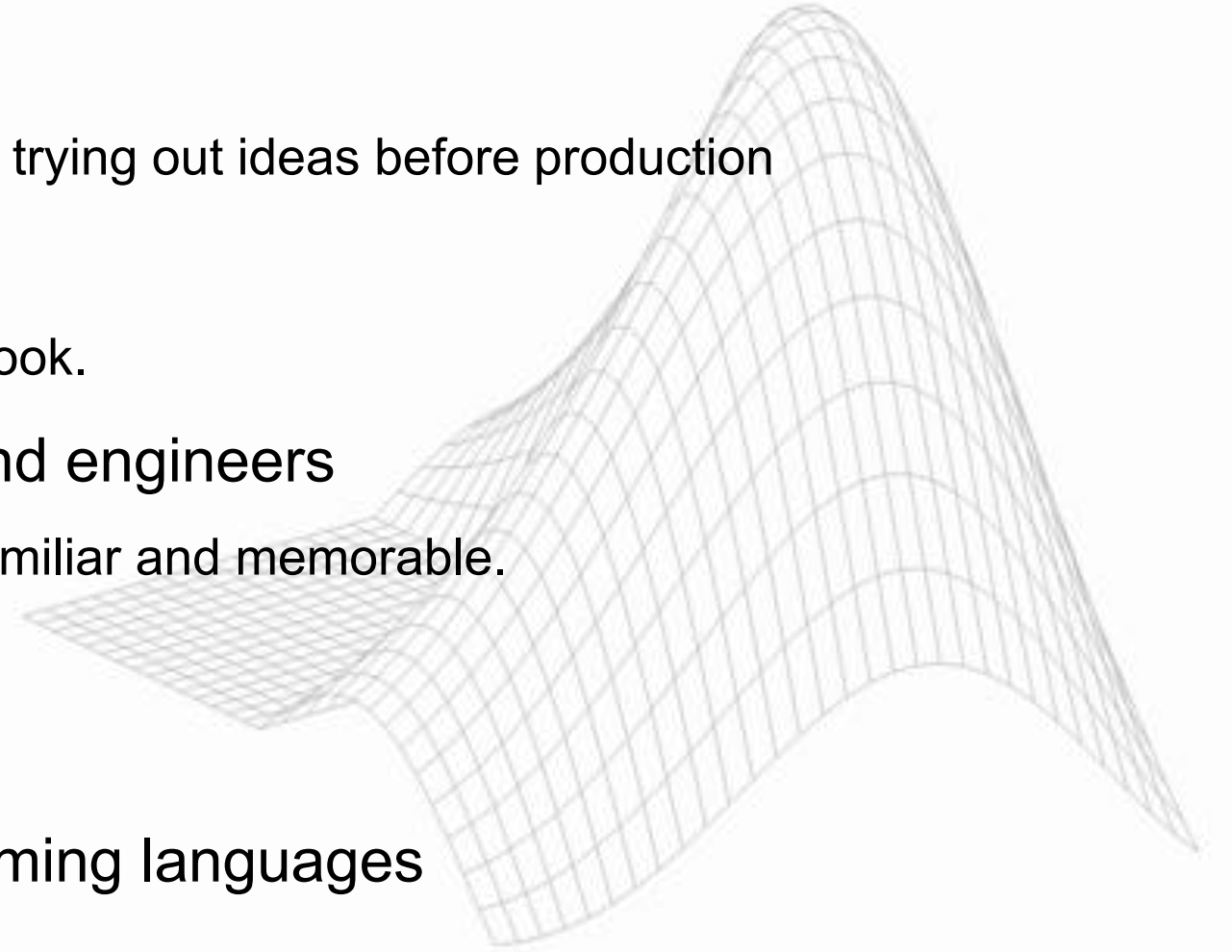
What is MATLAB?

- MATLAB – *MAT*rix *LAB*oratory
- High-performance language for technical computing
- Integrates computation, visualization, and programming
- Easy-to-use environment
- Application specific add ons called Toolboxes
- Can debug code easily

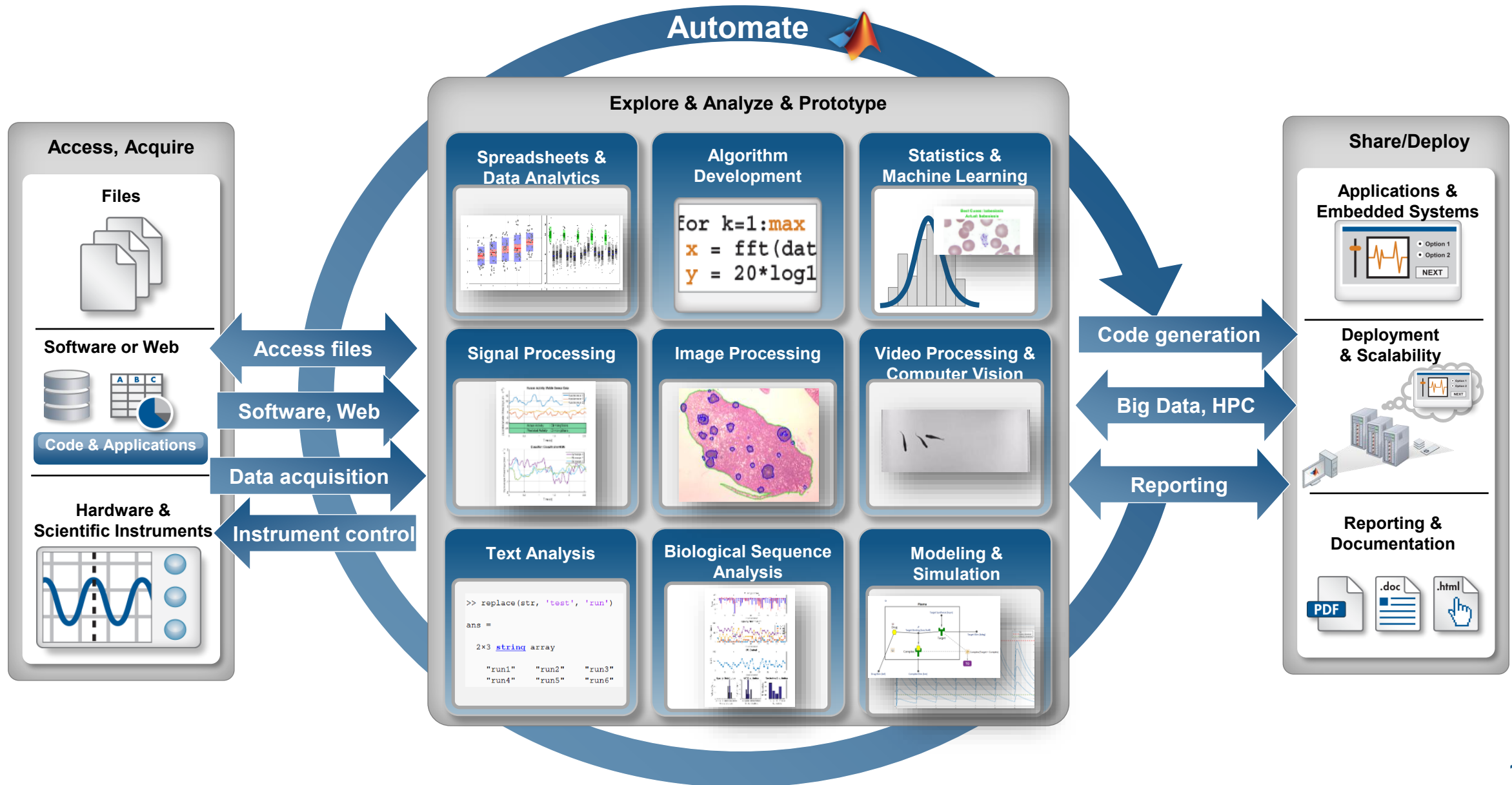


Why MATLAB?

- Extremely easy to code
 - Can be used for rapid prototyping and trying out ideas before production
- MATLAB speaks Math
 - Solve equations like you do on your book.
- Specially designed for scientists and engineers
 - Function names and signatures are familiar and memorable.
- Inbuilt apps
 - Filter designer, Signal analysis
- Interoperability with other programming languages
 - Python, C++ and many others



Technical Computing Workflow



MATLAB Desktop



Data Analysis

Explore, model, and analyze data



Graphics

Visualize and explore data



Algorithm Development

Design algorithms for desktop and embedded applications



App Building

Create desktop and web apps



Using MATLAB with Other Languages

Use MATLAB with Python, C/C++, Fortran, Java, and other languages



Hardware

Connect MATLAB to hardware



Parallel Computing

Perform large-scale computations and parallelize simulations using multicore desktops, GPUs, clusters, and clouds



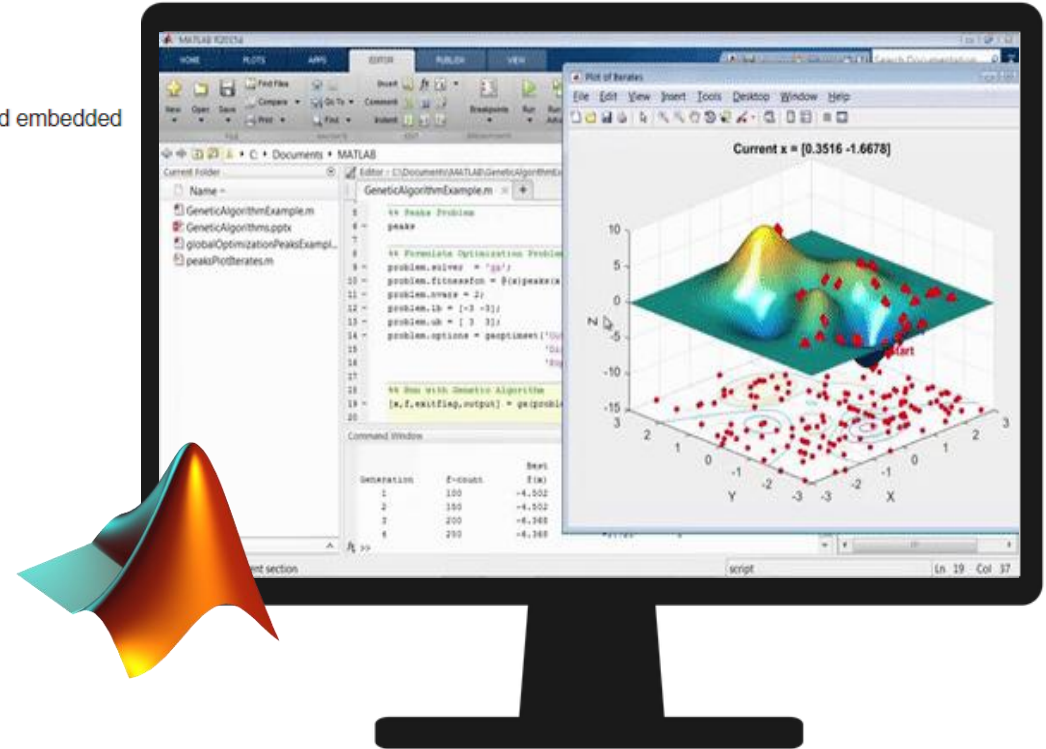
Web and Desktop Deployment

Share your MATLAB programs



MATLAB in the Cloud

Run in cloud environments from MathWorks Cloud to public clouds including AWS and Azure

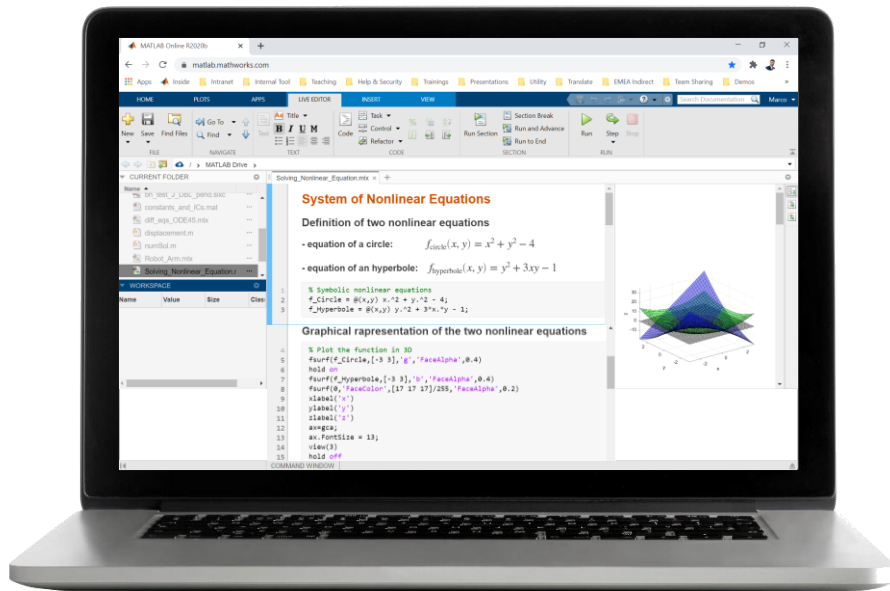


Math. Graphics. Programming.

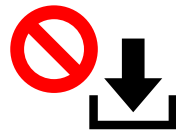
MATLAB Online

- Use MATLAB through your web browser
- Always latest release
- MATLAB Drive for cloud storage sync with your Desktop
- Collaboration with others: share and publish
- Anytime, anywhere

<https://matlab.mathworks.com>



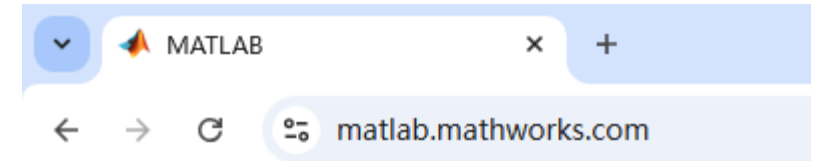
everywhere



no download



cloud



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Use **MATLAB Drive™** to synchronize your MATLAB files between your computers and MATLAB Online.

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



MATLAB Mobile

- Use MATLAB through your mobile
- Sync with MATLAB Drive for cloud storage
- Connect to the Cloud
- Connect to your computer
- Acquire Data Sensors for iOS and Android
- Anytime, anywhere



everywhere



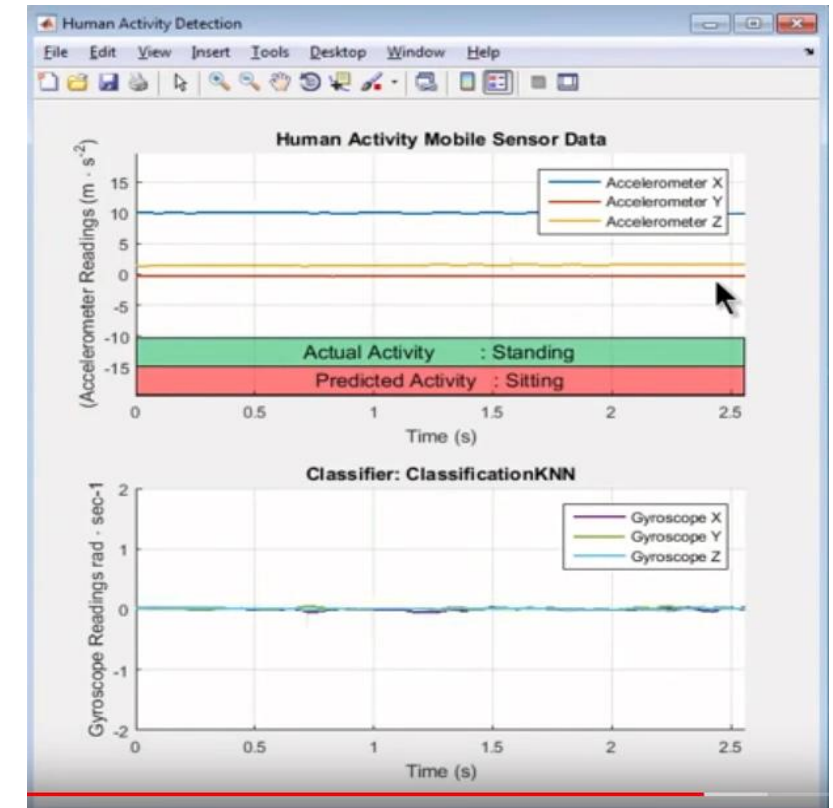
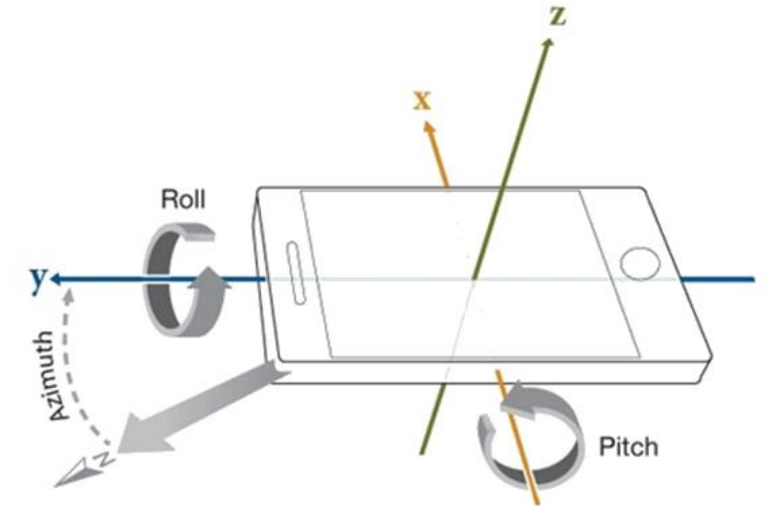
cloud



plug and play

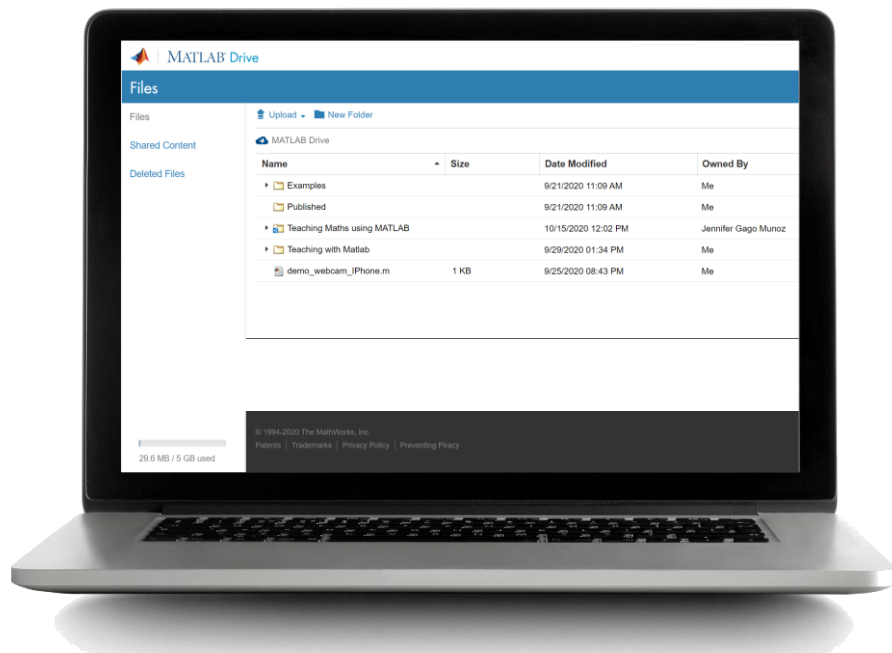
For more info on **MATLAB Mobile**

have look [here](#)



MATLAB Drive

- MATLAB Drive for cloud storage sync with your Desktop
- Collaboration with others: share and publish
- Offline access and syncing changes with Drive Connector
- 20 GB of files with a valid MATLAB License
- Anytime, anywhere



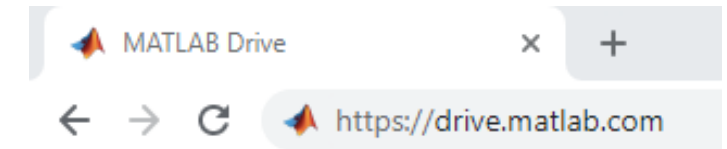

up to 20Gb


cloud


share

For more info on **MATLAB Drive**
have look [here](https://drive.matlab.com) 

<https://drive.matlab.com> 



MATLAB® Drive

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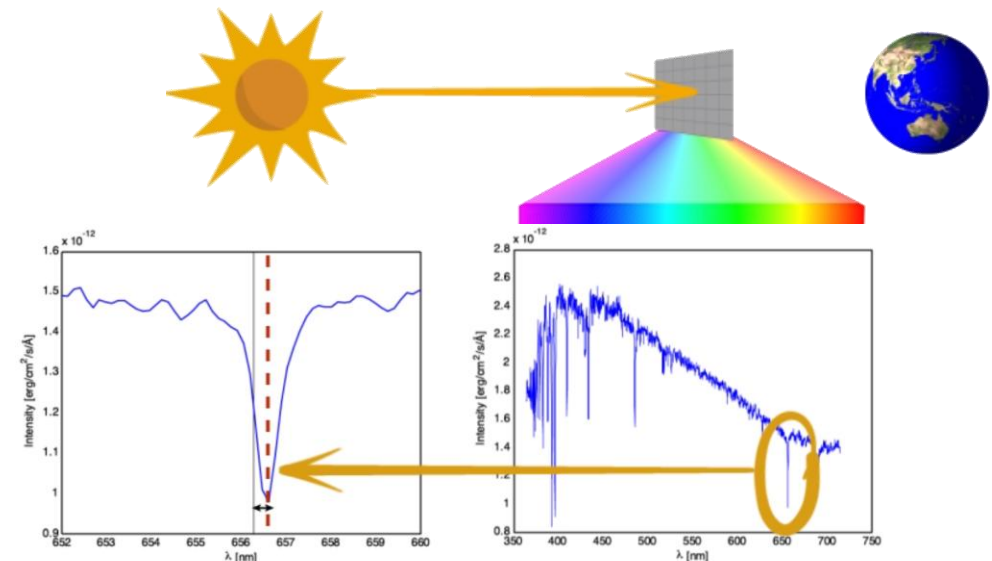
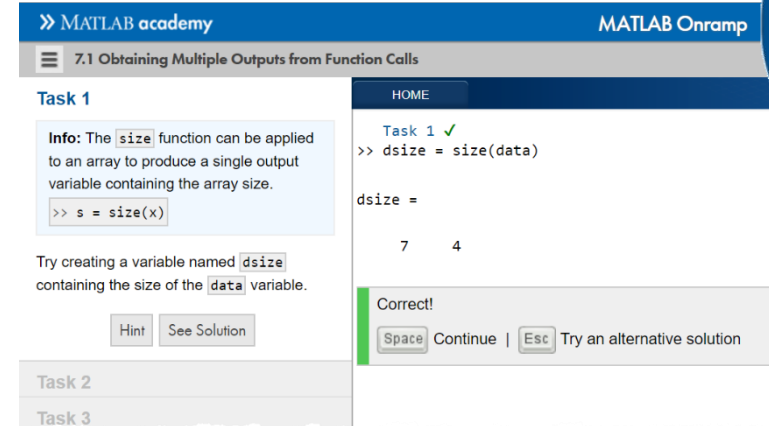
[Create Account](#)

[Learn more about MATLAB Drive.](#)

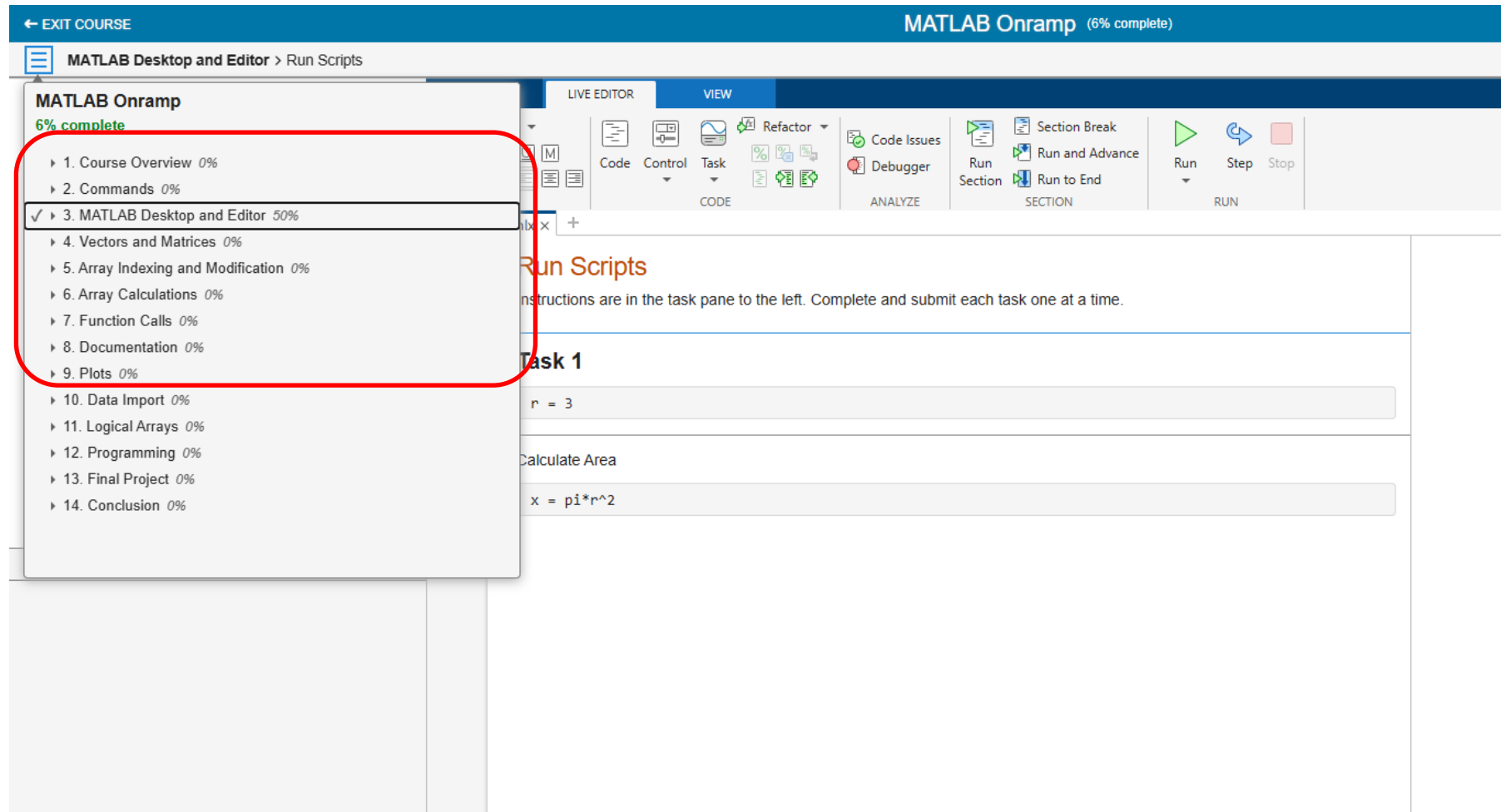
[Install MATLAB Drive Connector.](#)

MATLAB Onramp

- Learn the basics of MATLAB in 2 hours, at no cost
- Hands-on exercises with feedback
- Projects with real world applications
- Offered in English, Japanese, Spanish, Chinese and Korean
- Topics include:
 - MATLAB commands
 - Importing and manipulating data
 - Creating and annotating plots
 - Scripts and basic programming constructs



Today's tasks:



The screenshot displays the MATLAB Onramp interface. At the top, a blue header bar contains a back arrow and the text "EXIT COURSE" on the left, and "MATLAB Onramp (6% complete)" on the right. Below the header, a breadcrumb trail reads "MATLAB Desktop and Editor > Run Scripts".

On the left side, a panel titled "MATLAB Onramp" shows a progress list. The first three items are: "1. Course Overview 0%", "2. Commands 0%", and "3. MATLAB Desktop and Editor 50%". Item 3 is highlighted with a red rounded rectangle and has a checkmark icon to its left. Below item 3 are items 4 through 14, all with "0%" completion. Item 14 is "14. Conclusion 0%".

On the right side, the "LIVE EDITOR" is visible. It has a "VIEW" tab selected, showing a toolbar with icons for "Code", "Control", "Task", "Refactor", "Code Issues", "Debugger", "Run Section", "Run and Advance", "Section Break", "Run to End", "Run", "Step", and "Stop". Below the toolbar, the "Run Scripts" section is active, displaying instructions: "Instructions are in the task pane to the left. Complete and submit each task one at a time." Below this, "Task 1" is shown with a text input field containing "r = 3". Underneath, the instruction "Calculate Area" is followed by another text input field containing the formula "x = pi*r^2".

Navigate in MATLAB Central

<https://www.mathworks.com/matlabcentral> 

- ❑ Check this short 2 min video: What Is the MATLAB Central Community?

Check this [link](#) 

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An open exchange for the MATLAB and Simulink user community

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Simulación Horno



Ruben Antontio in File Exchange on 2025年9月9日

Actividad semana 5

Tags:

simulation

👁 4 ★ 0 ⬇ 1



Looking for collaborators/mentors with ML and MATLAB expertise



Subha in General Community on 2025年9月9日

2



Yueyi Xu

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Onramps (Introductory Courses)

Free

- Introduction to the Online Courses learning interface
- Helps learners get started with tools or applications
- Sometimes a prerequisite for longer courses
- Can trial OTS before buying



MATLAB Onramp



Simulink Onramp



Circuit Simulation Onramp



Machine Learning Onramp



Power Systems Simulation Onramp



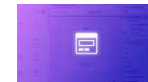
Image Processing Onramp



System Composer Onramp



Object Oriented Programming Onramp



App Building Onramp



Simscape Onramp



Stateflow Onramp



Online Training Suite (OTS)

- Annual access to *all* MATLAB and Simulink online training courses
 - 70 Short Courses
 - 16 Learning Paths
- Offers learning flexibility for:
 - upskilling/reskilling
 - exploring new topics and ideas
 - meeting prerequisites for instructor-led courses or consulting engagements
- Choose to take individual lessons, short courses, or full learning paths
- Wide range of available topics—new courses and topics added every few months

	Build MATLAB Proficiency LEARNING PATH: 8 COURSES Gain a comprehensive foundation in MATLAB to confidently tackle more complex challenges and applications.
	Simulink Fundamentals 8 hours Languages Learn how to use Simulink, a graphical simulation tool for modeling dynamic physical systems.
	Find and Extract Subsets of Data 1 hour Languages Use logical indexing to filter data and count elements.
	Machine Learning Techniques in MATLAB LEARNING PATH: 4 COURSES Build your machine learning skill set.
	MATLAB Coding Practices for Efficiency and Performance 1.5 hours Languages Optimize the efficiency of code using coding best practices in MATLAB.
	Debugging and Error Handling 1 hour Languages Identify, troubleshoot, and resolve errors to optimize your coding workflows and minimize disruptions.
	Core Signal Processing Techniques in MATLAB LEARNING PATH: 4 COURSES Use MATLAB to learn effective signal processing techniques for sampling, spectral analysis, and filtering.
	How MATLAB Graphics Work 1 hour Languages Use the graphics hierarchy to gain fine control over graphics.
	Deep Learning Techniques in MATLAB for Image Applications LEARNING PATH: 4 COURSES Build your deep learning skill set to tackle a variety of image applications.
	Software Development in MATLAB LEARNING PATH: 3 COURSES Write well-organized, user-friendly applications in MATLAB that will work correctly now and in the future.



Learning Paths – [see all](#)

Included in OTS

- Curated content for specific workflows & learning goals
- Provide a structured learning journey
- Paths show a recommended order



Advanced MATLAB Programming Skills
4 courses - 8 hours



Build MATLAB Proficiency
8 courses - 13 hours



Control System Design with MATLAB and Simulink
5 courses – 3.5 hours



Core MATLAB Skills
4 courses - 6 hours



Core Signal Processing Techniques in MATLAB
4 courses – 5.5 hours



Data Analysis in MATLAB
5 courses – 8 hours



Deep Learning Techniques in MATLAB for Image Applications 5 courses – 4 hours



Handle Inconsistent and Unstructured Data Files
5 courses – 9.5 hours



Image Segmentation and Analysis in MATLAB
5 courses – 6.5 hours



Machine Learning Techniques in MATLAB
4 courses – 6.5 hours



MATLAB for the MathWorks Certified MATLAB Associate Exam 14 courses – 23 hours



MATLAB Skills for Simulink Modeling
5 courses – 8.5 hours



Organize Tabular Data in MATLAB
4 courses – 6 hours



Programming in MATLAB
3 courses – 5 hours



Software Development in MATLAB
3 courses – 6.5 hours



Visualization in MATLAB
3 courses – 4.5 hours



Long-Form Course

Included in OTS

- Content goes beyond the basics
- Can take complete courses or shorter modules
- Good preparation for taking more advanced instructor-led training
- Equivalent in length to learning paths



Simulink Fundamentals

8 Hours

MATLAB Certification

Certification sets individuals apart in the job market and can help accelerate professional growth

Two paid levels of certification are offered:

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