



Conference Agenda

Track 1 - Do You Speak MATLAB?

Learn about the core capabilities of MATLAB for technical computing.

- **Analyzing and Visualizing Data with MATLAB**
- **Developing Algorithms with MATLAB**
- **Developing and Deploying Applications with MATLAB**

Track 2 - So, You Think You Know MATLAB?

Learn about the full breadth of the MATLAB product family.

- **Speeding Up MATLAB Applications with Parallel Computing**
- **Object-Oriented Programming in MATLAB**
- **Indexing Techniques for Image Processing in MATLAB**
- **What's New in MATLAB?**

Track 3 - How Far Can You Take MATLAB?

See innovative applications of MATLAB as part of the design and development process.

- **Cummins Utilizes Large Scale Automated Data Analysis for Automotive Diesel Engine Development**
- **Integration of a MATLAB-Based Pricing Engine with SAP®**
- **Generating Embedded C Code from MATLAB**

Track 4 - MATLAB Enabled Campus

Learn how MATLAB enabled campuses accelerate learning and discovery.

- **Teaching with MATLAB / Tips and Tricks**
- **Technical Computing on Campus: A Curriculum View**
- **Quantitative Data Analysis for Life Sciences**
- **Tools for Symbolic Computing in MATLAB**

Register online at www.mathworks.com/matlabvirtualconference.



Keynote Presentations

Experiments with MATLAB

Presenter: Cleve Moler, Chief Scientist, The MathWorks, and Creator of MATLAB

Join Cleve Moler, the creator of the original MATLAB, on a tour of *Experiments with MATLAB*, his new electronic book designed for high school and early college courses. Cleve will show a series of simple and elegant MATLAB routines for Sudoku, Mandelbrot sets, and other problems and puzzles.

The MATLAB Universe

Presenters: Tom Kush, Veteran MATLAB Watcher & Roy Lurie, VP of MATLAB Development

In this session Tom Kush will look at key technical directions and recent evolution of the MATLAB and Simulink products -- including performance, code generation, and other new features in recent releases, including R2009b -- in context of the worldwide MATLAB user community. This keynote will feature a live question-and-answer session with Roy Lurie, VP of MATLAB Development at The MathWorks.

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Track 1 - Do You Speak MATLAB?

Learn about the core capabilities of MATLAB for technical computing.

Analyzing and Visualizing Data with MATLAB

MATLAB provides interactive analysis tools that leverage thousands of pre-built engineering and analysis functions, letting you quickly and accurately analyze and visualize your data. Through product demonstrations, you'll see the entire data analysis process, from accessing your data, through preprocessing, visualization, and numerical analysis, to generating reports and integrating your work in other environments, such as Excel.

Developing Algorithms with MATLAB

The MATLAB environment combines all the tools and functionality that you need to transform your ideas into algorithms. This presentation will highlight how you can rapidly develop, test, and analyze design concepts and methods, allowing you to quickly iterate toward an optimal solution.

Developing and Deploying Applications with MATLAB

Attend this talk to see how you can use MATLAB to build applications around complex algorithms and graphics. We will build re-usable functions from our data analysis algorithm and create a graphical user interface that uses those functions, enabling others to easily perform the same analysis. Learn how these applications can be deployed as standalone executables, available to others who don't have access to MATLAB.

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Track 2 - So, You Think You Know MATLAB?

Learn about the full breadth of the MATLAB product family.

Speeding Up MATLAB Applications with Parallel Computing

Learn how you can enhance the performance of your MATLAB applications by taking advantage of computing resources from multicore and multiprocessor desktops to large-scale resources such as clusters, grids, and clouds. You will see how minimal programming efforts can enable your applications to take advantage of the available hardware.

Object-Oriented Programming in MATLAB

R2008a included major enhancements to the object-oriented programming capabilities in MATLAB, enabling easier development and maintenance of large applications and data structures. Attend this talk to learn how to define classes and work with objects in MATLAB. No knowledge of object-oriented programming is required.

Indexing Techniques for Image Processing in MATLAB

Steve shows several MATLAB array indexing techniques that are especially useful for implementing your own image processing operations or algorithms. He explains logical indexing first and illustrates how it interacts very nicely with binary images. Then he shows how linear indexing can be used to access arbitrary sets of image pixels. Finally he introduces an advanced concept called “neighbor indexing” that can be used to implement recursive neighborhood processes such as flood filling.

What’s New in MATLAB?

The MathWorks follows a twice-yearly general release schedule, with each release delivering an abundance of new features. Through overview slides and product demonstrations, this session will highlight many of the major new capabilities that have been introduced in the MATLAB product family over the last few years.

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Track 3 - How Far Can You Take MATLAB?

See innovative applications of MATLAB as part of the design and development process.

Cummins Utilizes Large Scale Automated Data Analysis for Automotive Diesel Engine Development

Presenters:

Tom Grana, Director, Aftertreatment Integration, Cummins

Ameya Oke, Cummins, Sr. System Integration Engineer, Cummins

Dan Denison, Cummins, Software Engineer, Cummins

In our work developing diesel engines for heavy duty trucks the primary calibration work is done in simulation space or based on characterization data from various sources. In the end, the engine and after-treatment calibration must be robust to variation in vehicle type, ambient conditions, duty cycle, and driving style. To better understand this variation and its effects, we have installed dataloggers in all our test vehicles, and in all our customer field test vehicles. We will discuss how we manage this data and methods we use to automate the preliminary data reduction.

RWE Integrates a MATLAB Based Pricing Engine with SAP®

RWE AG, the second largest energy supplier in Germany, has implemented a new energy pricing and risk management system in SAP®. After an extensive evaluation, RWE chose MATLAB for the development and deployment of the pricing models. The trusted numeric engine of MATLAB, combined with the ability to use MATLAB Compiler and MATLAB Builder JA to implement a client/server connection with SAP (using the Java Connector®), allowed them to develop a robust system that met their requirements. This presentation will highlight the approach taken on this project, and the results achieved.

Generating Embedded C Code from MATLAB

Embedded software engineers have long relied on MATLAB for algorithm design and prototyping while C code is the standard for implementation on embedded processors and DSPs. The challenge is transitioning a design from the flexible development environment of MATLAB to the constrained programming style of C. A subset of the MATLAB language, Embedded MATLAB®, eases this transition by automatically generating C code from MATLAB® and Simulink®. Learn how to create and/or modify your MATLAB algorithms to utilize the Embedded MATLAB subset, and automatically generate embeddable C code.

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Track 4 - MATLAB Enabled Campus

Learn how MATLAB enabled campuses accelerate learning and discovery.

Teaching with MATLAB / Tips and Tricks

MATLAB offers many features and functions that facilitate presentation of engineering concepts in the classroom.

Technical Computing on Campus: A Curriculum View

We will discuss the significance and broad application of Technical Computing in engineering education.

Technical Computing is defined as the union of math and programming, and by having these skills engineering students are better prepared for upper level courses, research, and industry. We will present best practices that highlight introducing these skills in a fashion that promotes mastery over the full curriculum track.

Quantitative Data Analysis for Life Sciences

Life Scientists often need to perform data analysis and visualization of experimental data. One common task is fitting an equation or a surface to data. This task can be difficult since many tools require the user to have advanced mathematical or programming experience. Also, it's common for researchers to perform repeat fittings with multiple data sets, which can be time consuming. This session will show how to perform curve fitting and surface fitting with MATLAB in a manner suitable for those with little to no programming experience.

Tools for Symbolic Computing in MATLAB

A general introduction to Symbolic Math Toolbox, including the MuPAD language and notebook. The demo portion shows how to use symbolic math to model a mass-spring-damper system.

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