



Course Title:

Accelerating and Parallelizing MATLAB Code

Course Purpose:

This course covers a variety of techniques for making your MATLAB® code run faster. You will identify and remove computational bottle-necks using techniques like preallocation and vectorization. On top of that, you will take advantage of multiple cores on your computer by parallelizing for-loops with Parallel Computing Toolbox™. If you are working with long-running simulations, you will benefit from the hands-on demonstrations and exercises in the course.

Topics include:

- Improving performance within core MATLAB
- Generating MEX-files
- Parallelizing computations
- GPU computing

Pre- requisites:

MATLAB Fundamentals or equivalent experience using MATLAB.



- ✓ 1 training day
- ✓ Hours: 09:00-17:00
- ✓ Total training hours: 8

Teaching method

The course combines lectures, demonstrations and practical exercises in MATLAB, using original training books from MathWorks. The course is in Hebrew but the training materials are in English.

עמוד מס' 1

Training Center Systematics - Contact information:

Phone number: 03-7660111 Ext: 6 **Email:** training@systematics.co.il

Website: <http://www.systematics.co.il/mathworks>



Course Outline:

Improving Performance

Objective: Analyze code performance and utilize techniques for acceleration within MATLAB.

- Identifying bottle necks
- Preallocating arrays
- Vectorizing operations in various ways
- Rewriting algorithms

Parallelizing Computations

Objective: Parallelize code execution to take advantage of multiple cores.

- Opening additional MATLAB processes
- Running parallel for-loops
- Measuring speedup
- Processing multiple files in parallel

Parallel for-Loops

Objective: Explore parallel for-loops in more detail and apply techniques for converting for-loops to parfor-loops.

- Requirements of parallel for-loops
- Parallelizing for-loops
- Retrieving intermediate results

GPU Computing

Objective: Execute MATLAB code on your computer's graphics card (GPU) as another option for speeding up calculations.

- Overview of GPU architecture and processing
- Applications suitable for GPU processing
- Invoking MATLAB functions on the GPU
- Using pre-existing CUDA code

עמוד מס' 2

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