

Matlab @ INAF Del Vecchio

Background ntroduction Statistics Summary

Matlab @ INAF: a first report

Some Statistics about Matlab campus license available at INAF

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Outline

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Using Commercial Software

Do INAF Researchers Purchase S/W?

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- Introduction
- Statistic
- Summary

- Background
 - Many people use commercial s/w
 - They use *local* funds
 - Many purchased codes are available globally
 - The MS Office Case
- Actions
 - A survey to quantify the shared packages (2014)
- Output (Matlab)
 - 124 users answered



The Survey Output How many INAF Researchers Work with Matlab?

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124 answers		
use		
yes	60	
no	64	
future use		
yes	83	
no	29	



Rationale: A numerical computing environment What is Matlab

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- MATLAB (matrix laboratory) is a multi-paradigm numerical computing environment and fourth-generation programming language. A proprietary programming language developed by MathWorks, MATLAB allows:
 - matrix manipulations
 - plotting of functions and data
 - implementation of algorithms
 - creation of user interfaces
 - interfacing with programs written in other languages, including
 - C
 - C++
 - C#
 - Java
 - Fortran
 - Python



Rationale: A numerical computing environment Expanding Matlab

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- Although MATLAB is intended primarily for numerical computing
 - an optional toolbox uses the MuPAD symbolic engine, allowing access to symbolic computing abilities
 - an additional package, Simulink, adds graphical multi-domain simulation and model-based design for dynamic and embedded systems
 - $\bullet \approx$ 100 additional toolboxes are available



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Introduction

The Main Data The System Features

Developer(s) **MathWorks** Initial release 1984 Written in C, C++, Java Windows, Linux, and macOS Operating system Platform IA-32, x86-64 Proprietary commercial software License Website mathworks.com



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Introduction

The Product Overview How the Software is Structured





The Overall Input The Log File

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- The floating network license Mathworks policy
 - The license server runs @ OATs
 - The code runs locally
- The logging Mathworks policy
 - The logfile provided by M. Sponza @ OATs
 - > 100,000 lines from Jan 6 to Nov 11 2016
 - Allocation times and users computed with Matlab



The Overall Output The Linear Overview

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The Overall Output The Logarithmic Overview

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The Overall Output The First 12 Top Time Allocation

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allocated time [hrs]	user	toolbox
4132	massimiliano	MATLAB
2710	massimiliano	Curve_Fitting_Toolbox
2078	massimiliano	Optimization_Toolbox
1565	ROBERTO	MATLAB
1541	shark	MATLAB
1263	marco	MATLAB
1258	VSHARK	MATLAB
1196	ciro	Symbolic_Toolbox
1050	shark	Statistics_Toolbox
945	ciro	MATLAB
934	massimiliano	Image_Toolbox
772	mesposito	MATLAB



The Overall Output The First 12 Top Users

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user	allocated time [hrs]
massimiliano	11457
shark	4340
marco	2272
ciro	2164
mesposito	2144
ROBERTO	2080
VSHARK	2027
holography	1394
oper	1367
covino	1155
Emanuele	750
simchi	583



The Overall Output The First 12 Top Toolboxes

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toolbox	allocated time [hrs]
MATLAB	17454
Curve_Fitting_Toolbox	4116
Optimization_Toolbox	3277
Statistics_Toolbox	2730
Image_Toolbox	2729
Signal_Toolbox	1938
Symbolic_Toolbox	1713
Instr_Control_Toolbox	910
Econometrics_Toolbox	447
Signal_Blocks	419
SIMULINK	320
MATLAB_Report_Gen	301



The Overall Output Accumulating the daily License Allocations

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The Statistics Output

Many Toolboxes, Many Users, and Many Times

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- 116 users (93.5% of the survey participants)
 - 39 toolboxes (60% of the availability*)
- Almost all toolboxes have been *called* by at least one user at least once
 - except
 - Aerospace_Blockset
 - Bioinformatics_Toolbox
 - Fuzzy_Toolbox
 - including, e.g.
 - Econometrics_Toolbox
 - Financial_Toolbox

• \approx 4.4 years of allocated time over \approx 9 months (Jan – Nov 2016)

(*) твс



A Un-Irrelevant Consideration Do we Save Money?

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- As the mean cost of each toolbox is ≈ 2 k€, the current (nov. 2016) Matlab total computing potential would cost 2 × 116 × 39 ≈ 9 M€.
- The Jan 2016 MEA agreement with Mathworks Italy gives us such a potential at \approx 50 k€