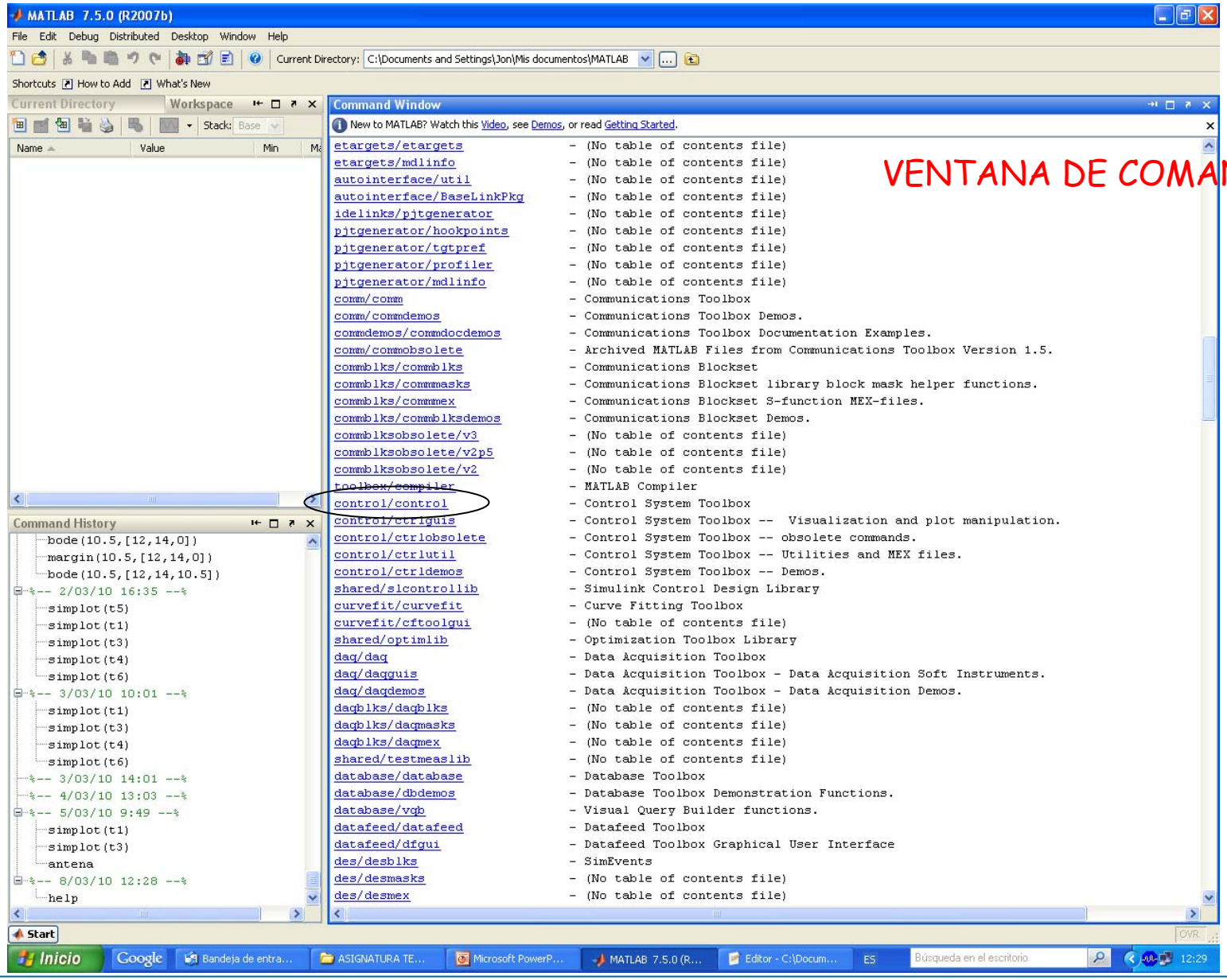
1. Entorno de Matlab
2. Control system toolbox de Matlab
3. Simulink

Tema 7. Análisis y diseño asistido por ordenador de sistemas de orientación utilizando Matlab. Entorno del Matlab

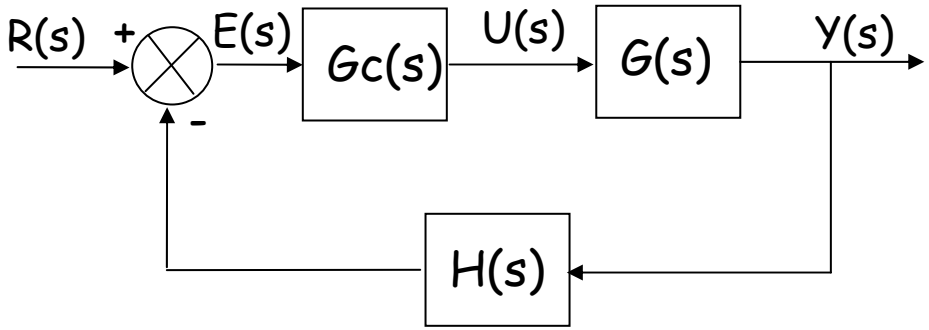
MATLAB



VENTANA DE COMANDOS

CONTROL SYSTEM TOOLBOX DE MATLAB

El Control System Toolbox de Matlab ofrece la posibilidad de representar la respuesta dinámica de los sistemas lineales invariantes en el tiempo (LTI). Para ello, dispone de distintas instrucciones que facilitan y simplifican el estudio dinámico tanto en el dominio del tiempo como en el de la frecuencia.
Consideremos el siguiente sistema:



Instrucciones en Matlab

Función de Transferencia (tf)

G= tf (num, den)

num= numerador de la función de transferencia

den= denominador de la función de transferencia

Polinomio: num=a sn+b sn-1+...+ c

p=[a,b,...,c]

Numero Complejo: 1+2i, 1+2j, 1+2*I,1+2*j

Raíces de un polinomio

roots(num)

Multiplicación de dos Funciones de Transferencia (*)

G1=Gpid*G

Realimentación: feedback

Glc=feedback(G1,H) Realimentación negativa

Glc=feedback(G1,H,+) Realimentación positiva

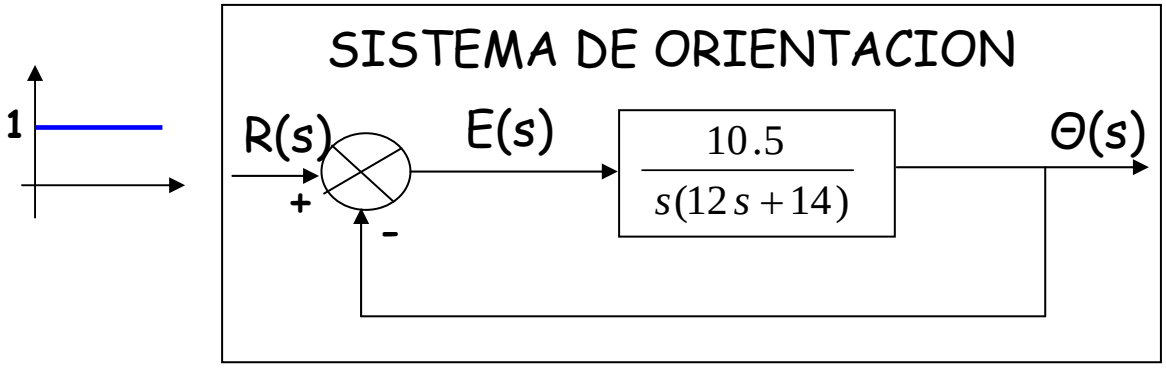
Siendo H= función de transferencia de la realimentación

Entrada escalón (step)

step (Glc) ---------- entrada escalón para la función Glc(s)

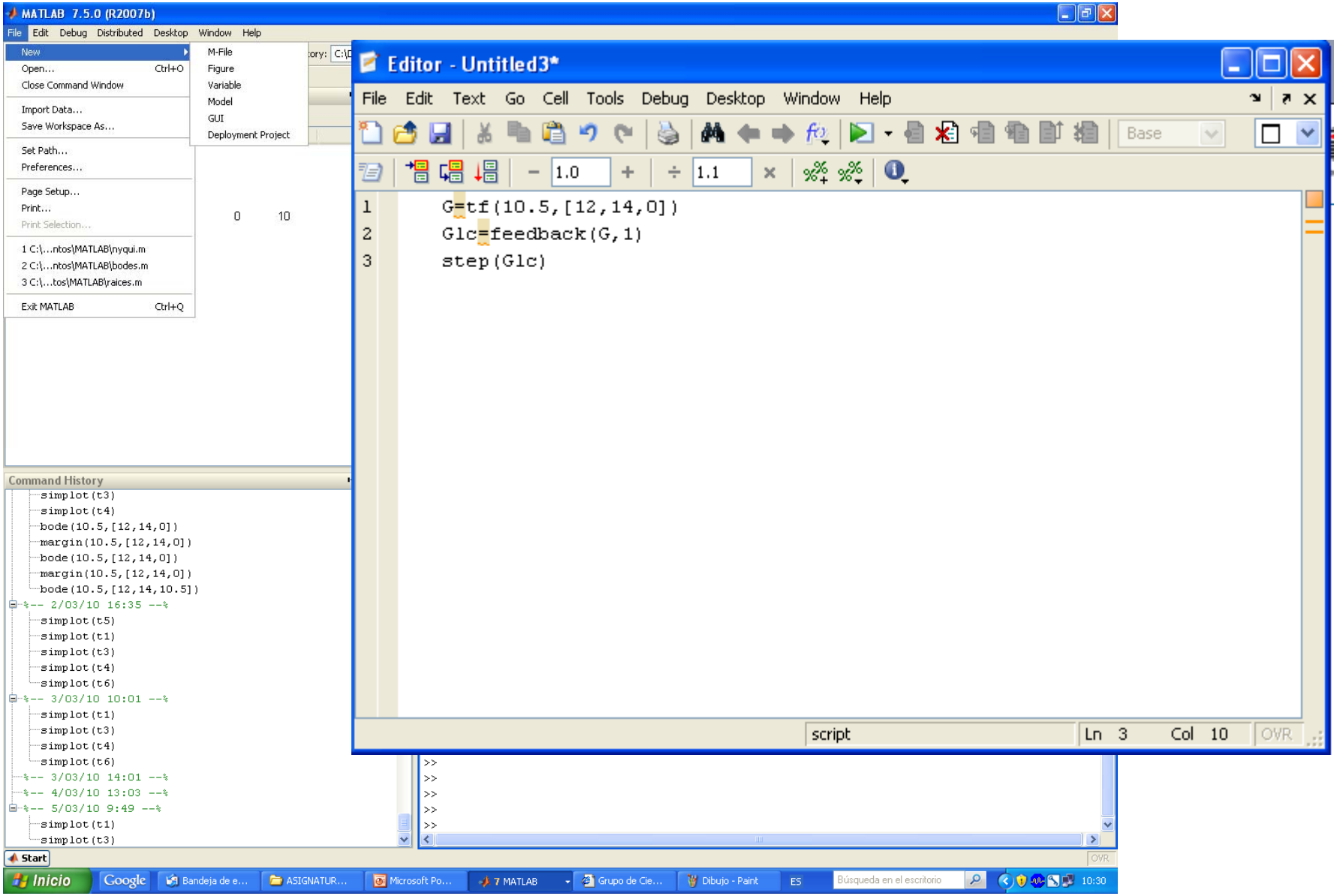
step (G1,G2,G3,..)--- entrada escalón para la función G1(s), G2(s), G3(s),....

Ejemplo:



Programa:

```
G=tf(10.5,[12,14,0])
Glc=feedback(G,1)
step(Glc)
```


MATLAB 7.5.0 (R2007b)
File Edit Debug Distributed Desktop Window Help
New
Open... Ctrl+O
Close Command Window
Import Data...
Save Workspace As...
Set Path...
Preferences...
Page Setup...
Print...
Print Selection...
1 C:\...ntos\MATLAB\nyqui.m
2 C:\...ntos\MATLAB\bodes.m
3 C:\...tos\MATLAB\raices.m
Exit MATLAB Ctrl+Q
M-File
Figure
Variable
Model
GUI
Deployment Project
Editor - Untitled3*
File Edit Text Go Cell Tools Debug Desktop Window Help
1 G=tf(10.5,[12,14,0])
2 Glc=feedback(G,1)
3 step(Glc)
script Ln 3 Col 10 OVR
Command History
simplot(t3)
simplot(t4)
bode(10.5,[12,14,0])
margin(10.5,[12,14,0])
bode(10.5,[12,14,0])
margin(10.5,[12,14,0])
bode(10.5,[12,14,10.5])
%-- 2/03/10 16:35 --%
simplot(t5)
simplot(t1)
simplot(t3)
simplot(t4)
simplot(t6)
%-- 3/03/10 10:01 --%
simplot(t1)
simplot(t3)
simplot(t4)
simplot(t6)
%-- 3/03/10 14:01 --%
%-- 4/03/10 13:03 --%
%-- 5/03/10 9:49 --%
simplot(t1)
simplot(t3)
Start
Inicio
Google
Bandeja de e...
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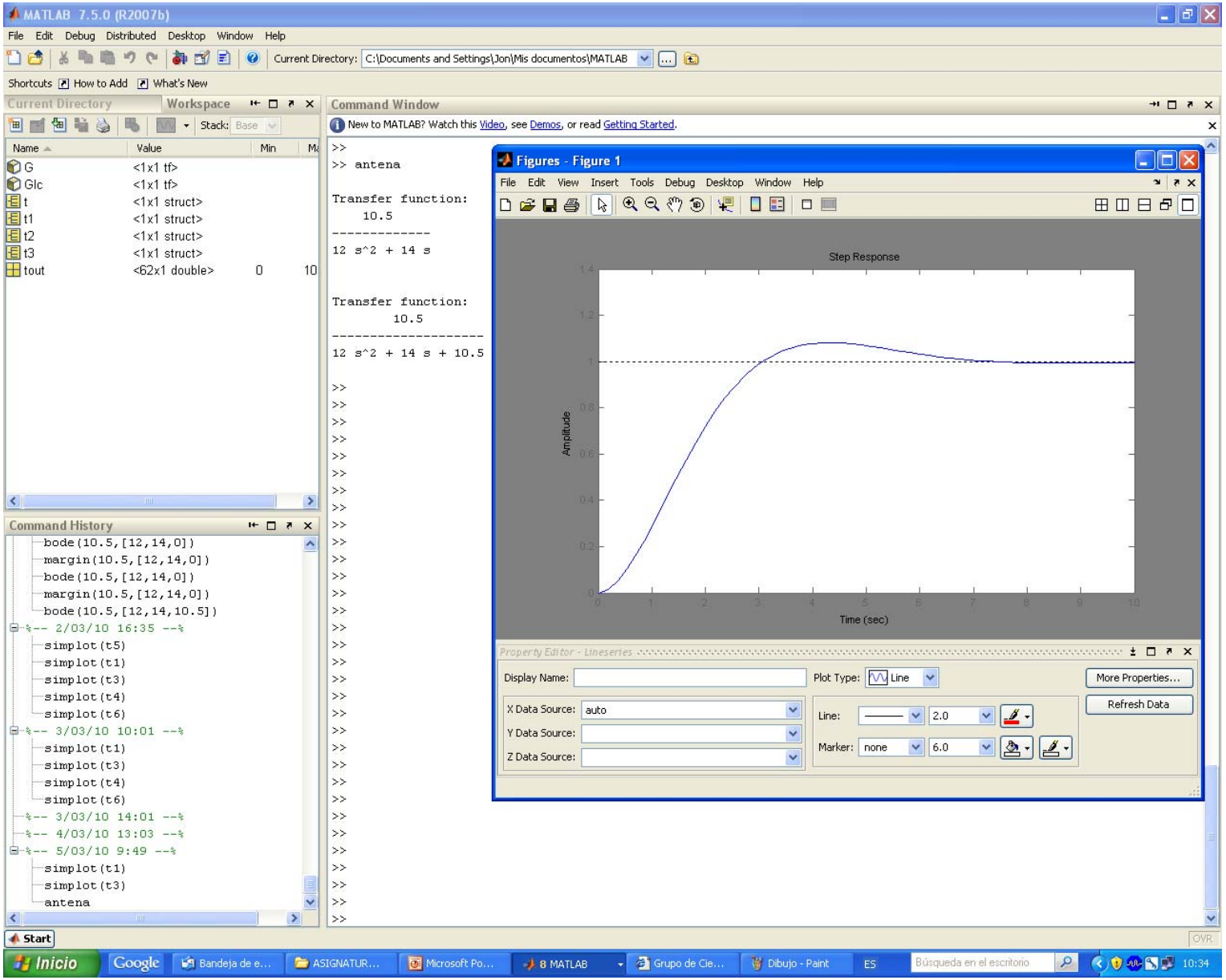
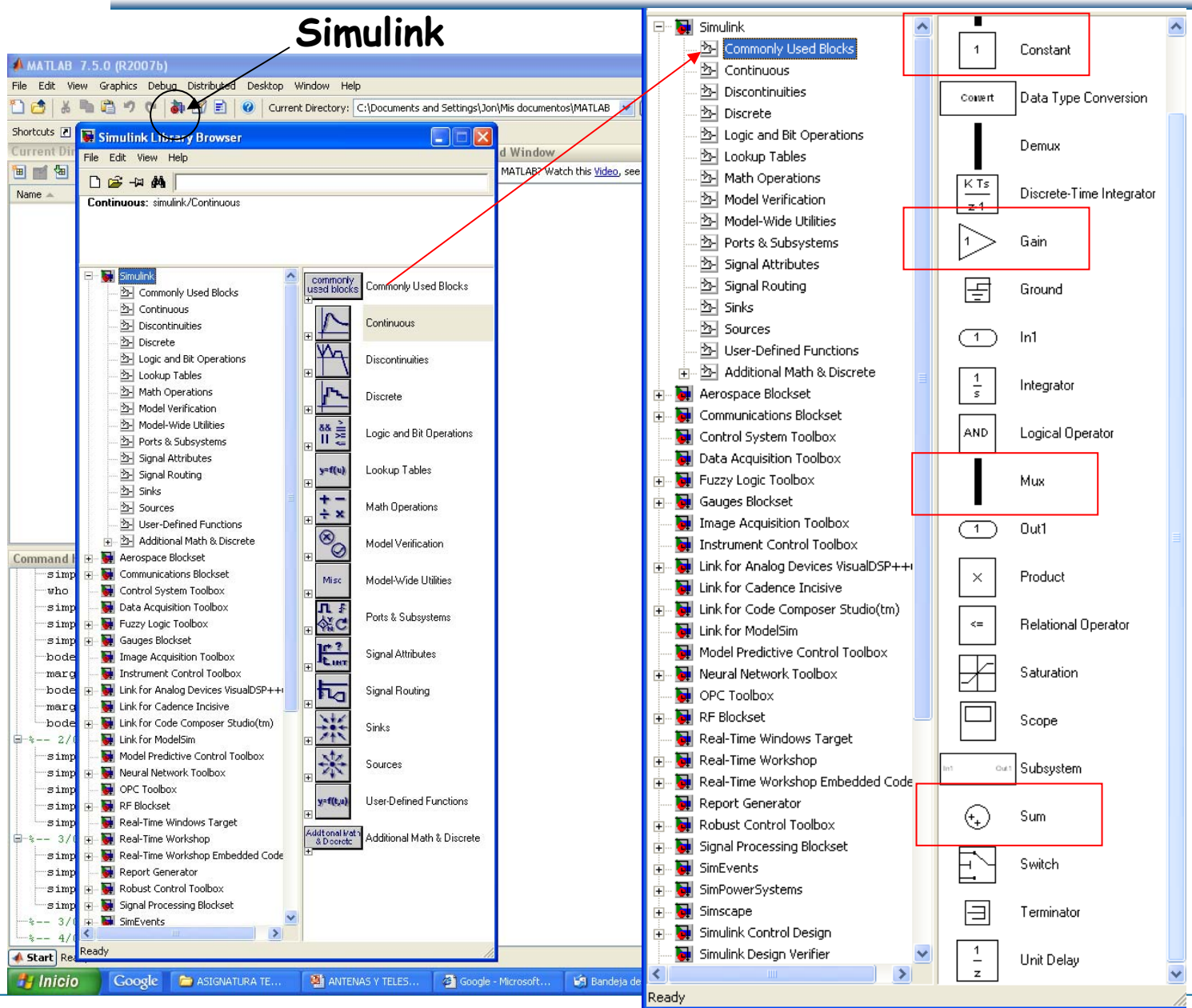
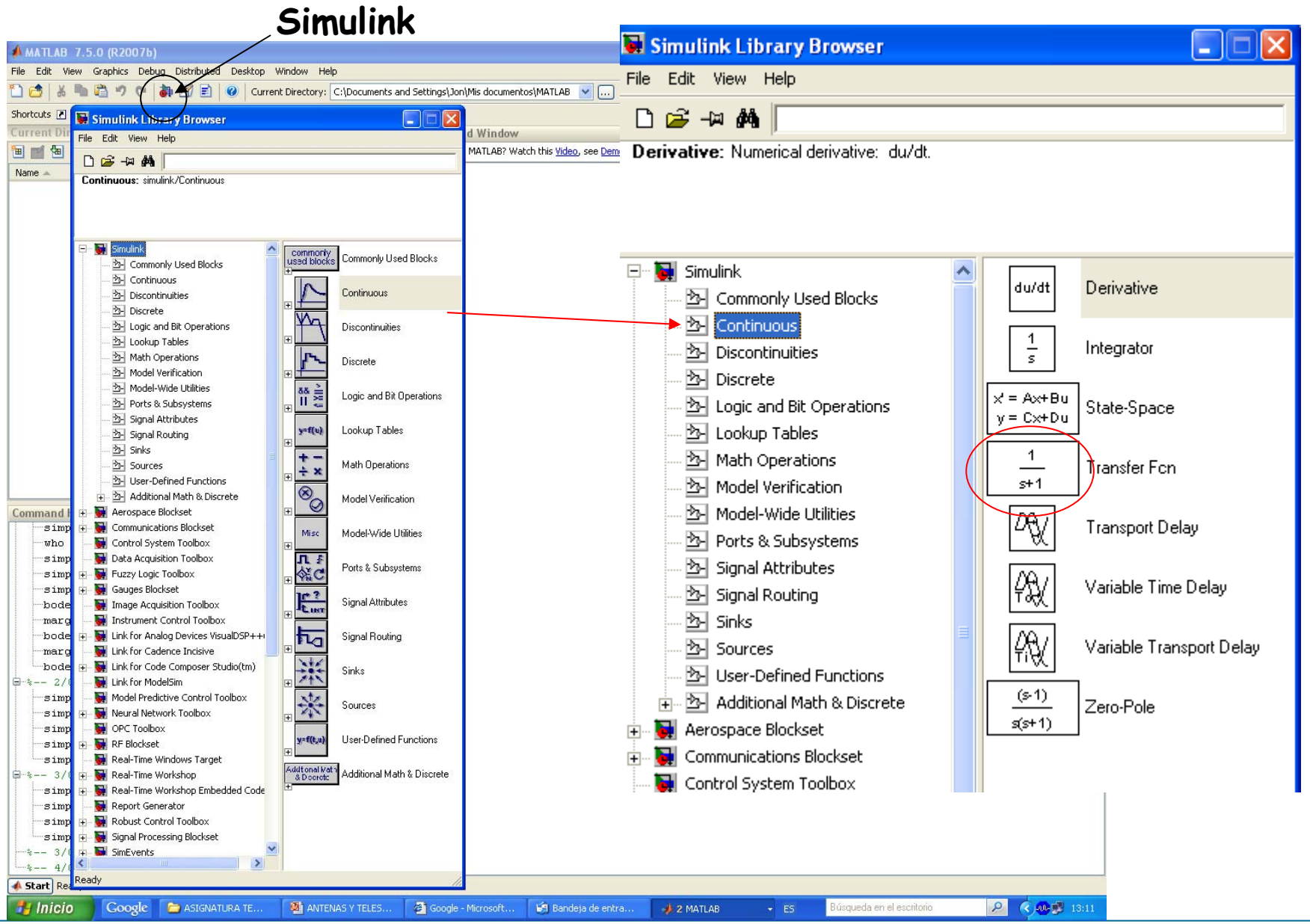
Microsoft Po...
7 MATLAB
Grupo de Cie...
Dibujo - Paint
ES
Búsqueda en el escritorio
10:30

Tema 7. Análisis y diseño asistido por ordenador de sistemas de orientación utilizando Matlab. Control System Toolbox



Tema 7. Análisis y diseño asistido por ordenador de sistemas de orientación utilizando Matlab. Simulink




Simulink
MATLAB 7.5.0 (R2007b)
File Edit View Graphics Debug Distributed Desktop Window Help
Current Directory: C:\Documents and Settings\Jon\Mis documentos\MATLAB
Simulink Library Browser
File Edit View Help
Continuous: simulink/Continuous
Simulink
Commonly Used Blocks
Continuous
Discontinuities
Discrete
Logic and Bit Operations
Lookup Tables
Math Operations
Model Verification
Model-Wide Utilities
Ports & Subsystems
Signal Attributes
Signal Routing
Sinks
Sources
User-Defined Functions
Additional Math & Discrete
Aerospace Blockset
Communications Blockset
Control System Toolbox
Simulink Library Browser
File Edit View Help
Derivative: Numerical derivative: du/dt.
Simulink
Commonly Used Blocks
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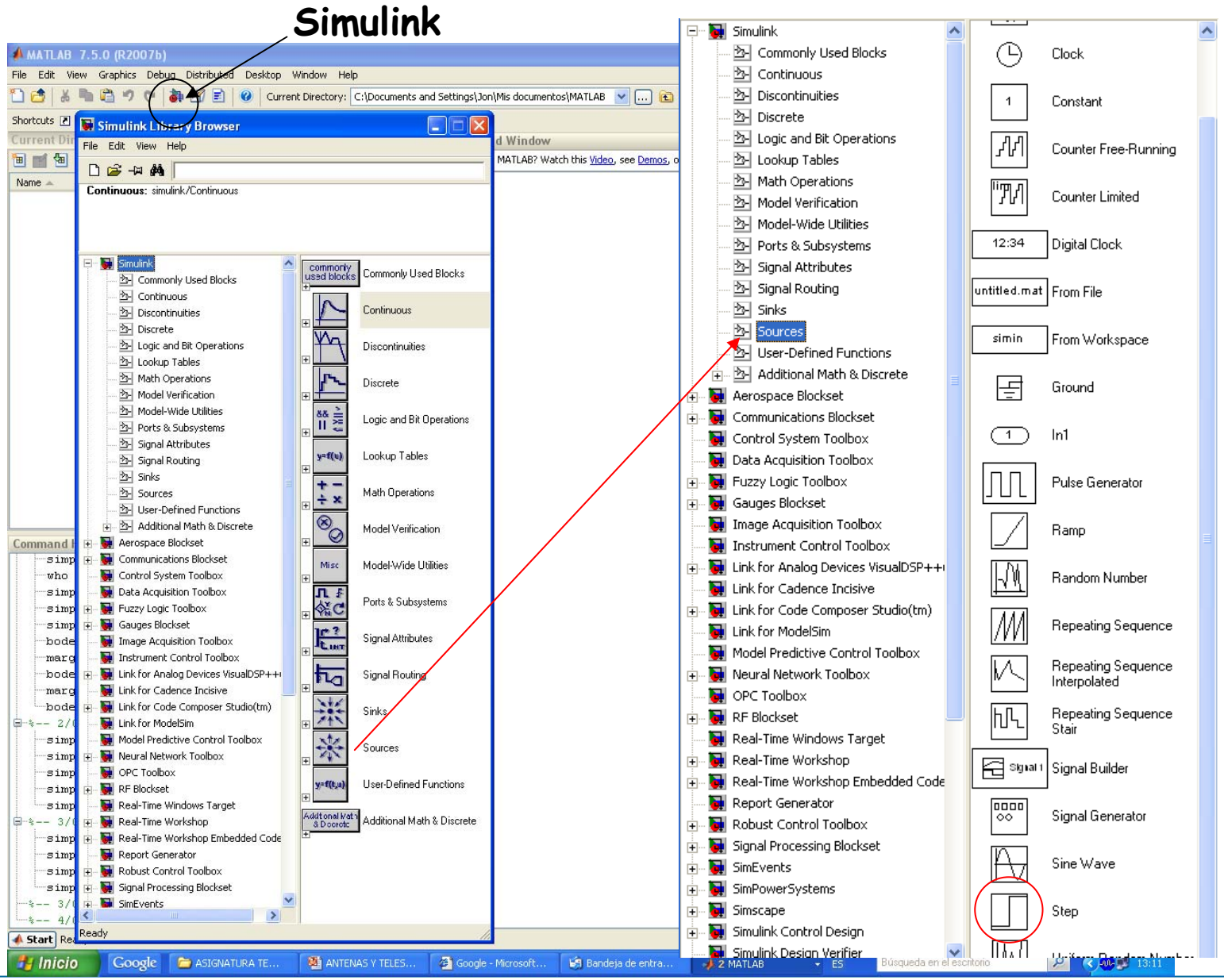
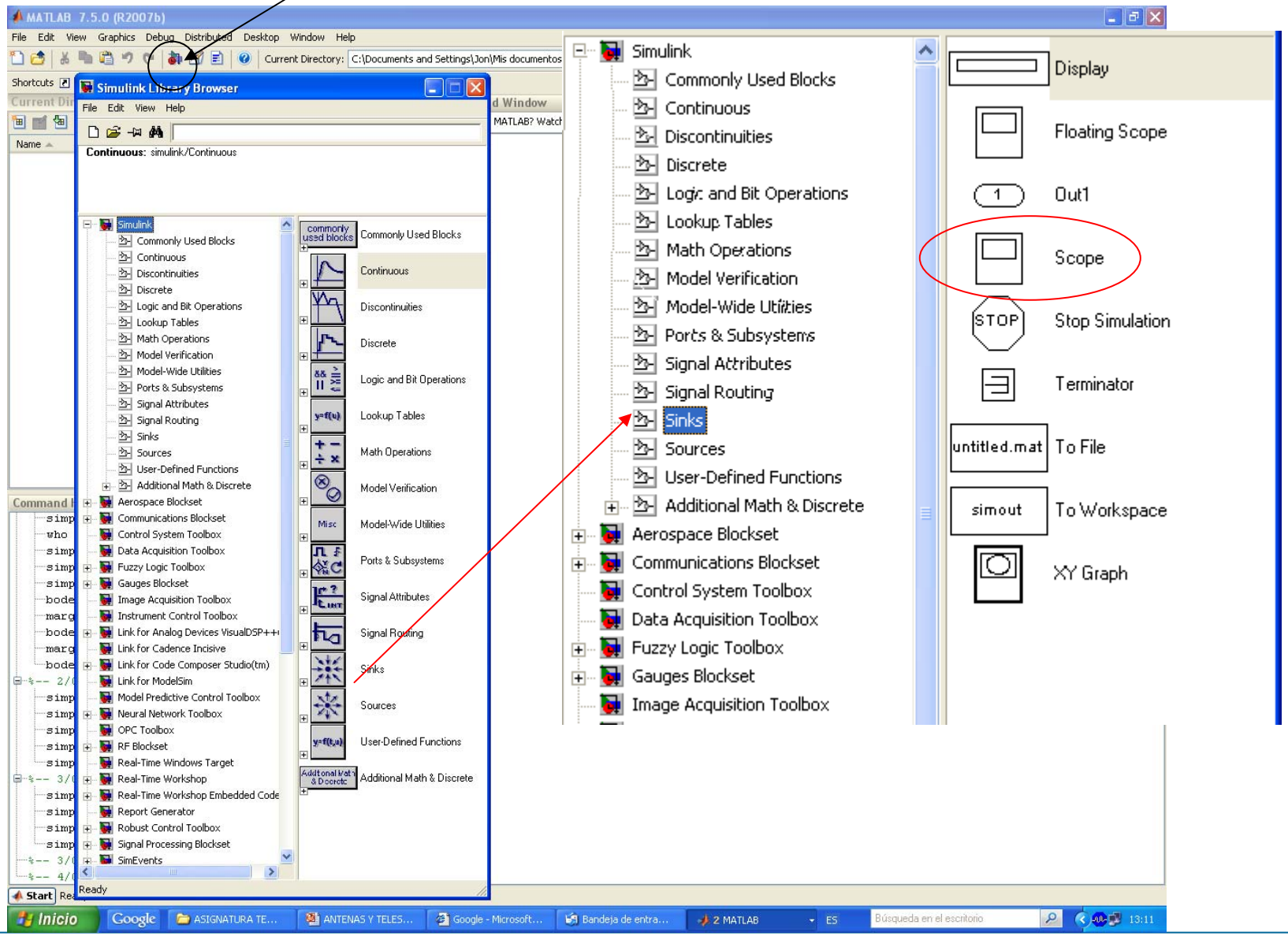
Signal Attributes
Signal Routing
Sinks
Sources
User-Defined Functions
Additional Math & Discrete
Aerospace Blockset
Communications Blockset
Control System Toolbox
Derivative
Integrator
State-Space
Transfer Fcn
Transport Delay
Variable Time Delay
Variable Transport Delay
Zero-Pole

Tema 7. Análisis y diseño asistido por ordenador de sistemas de orientación utilizando Matlab. Simulink



Simulink


MATLAB 7.5.0 (R2007b)
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Additional Math & Discrete
Aerospace Blockset
Communications Blockset
Control System Toolbox
Data Acquisition Toolbox
Fuzzy Logic Toolbox
Gauges Blockset
Image Acquisition Toolbox
Display
Floating Scope
Out1
Scope
Stop Simulation
Terminator
untitled.mat
To File
simout
To Workspace
XY Graph
Ready
Start
Inicio
Google
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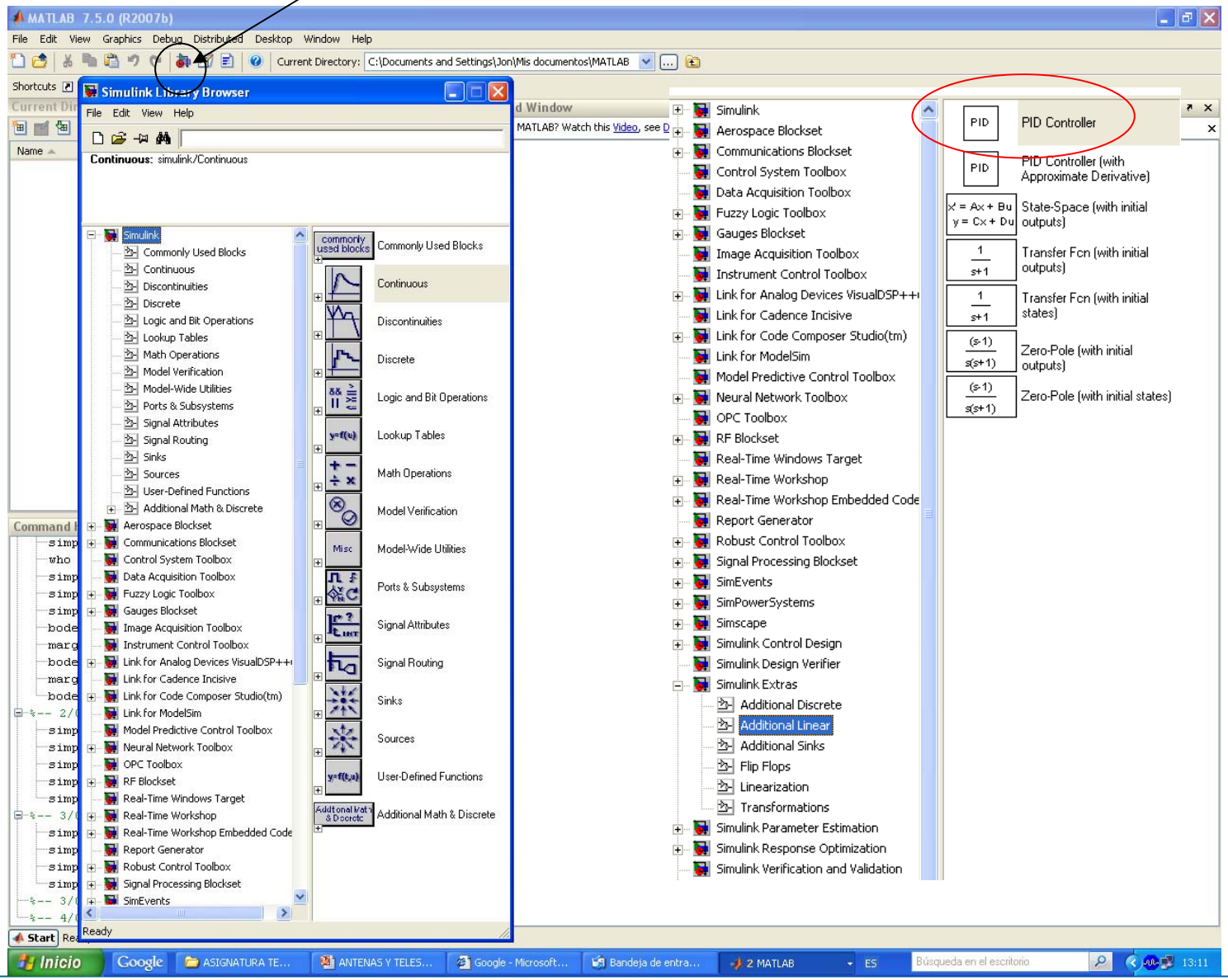
ANTENAS Y TELES...
Google - Microsoft...
Bandeja de entra...
2 MATLAB
ES
Búsqueda en el escritorio
13:11

Simulink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Continuous: simulink/Continuous
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Communications Blockset
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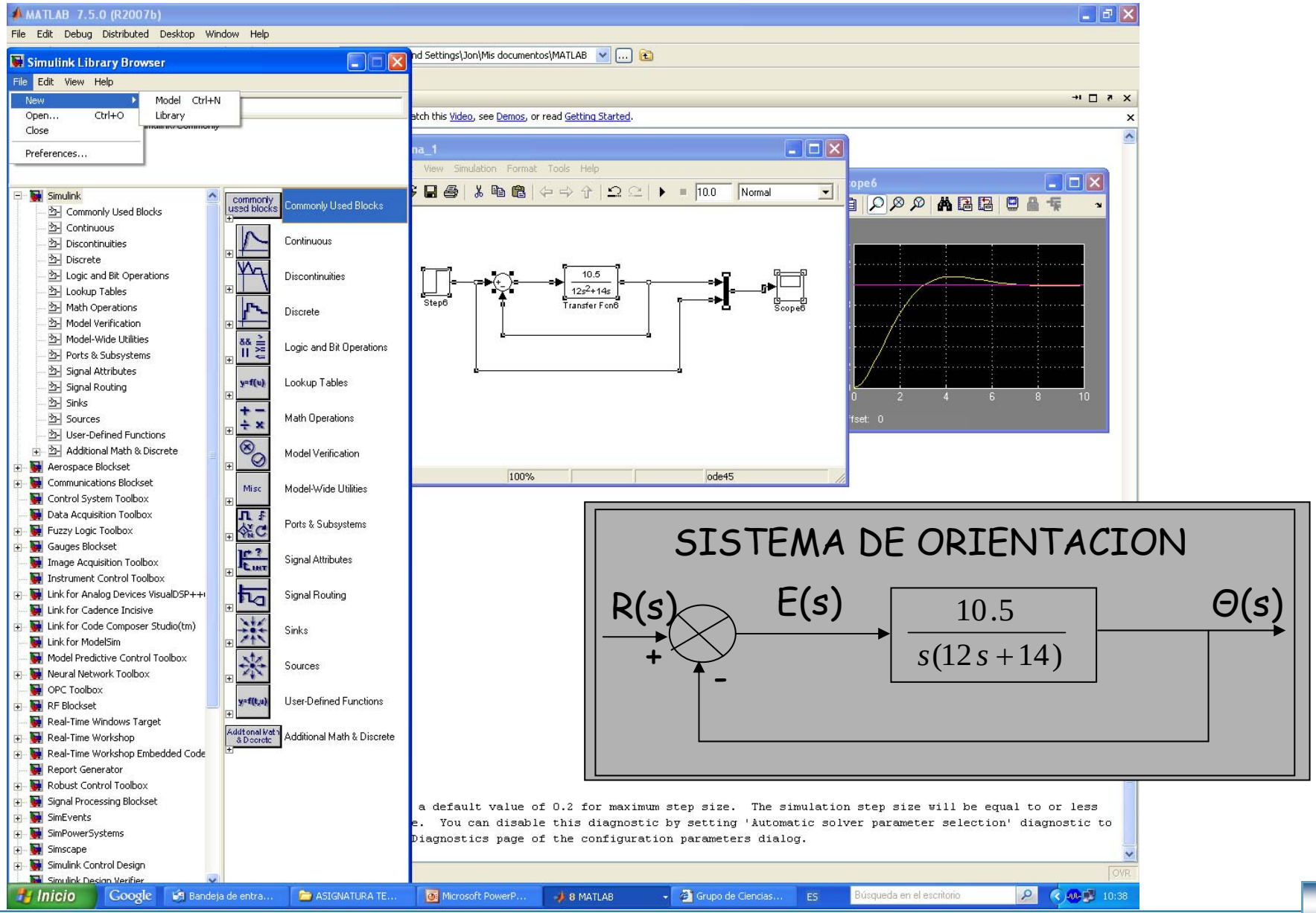
Data Acquisition Toolbox
Fuzzy Logic Toolbox
Gauges Blockset
Image Acquisition Toolbox
Instrument Control Toolbox
Link for Analog Devices VisualDSP++
Link for Cadence Incisive
Link for Code Composer Studio(tm)
Link for ModelSim
Model Predictive Control Toolbox
Neural Network Toolbox
OPC Toolbox
RF Blockset
Real-Time Windows Target
Real-Time Workshop
Real-Time Workshop Embedded Code
Report Generator
Robust Control Toolbox
Signal Processing Blockset
SimEvents
SimPowerSystems
Simscape
Simulink Control Design
Simulink Design Verifier
Simulink Extras
Additional Discrete
Additional Linear
Additional Sinks
Flip Flops
Linearization
Transformations
Simulink Parameter Estimation
Simulink Response Optimization
Simulink Verification and Validation
PID Controller
PID Controller (with Approximate Derivative)
State-Space (with initial outputs)
Transfer Fcn (with initial outputs)
Transfer Fcn (with initial states)
Zero-Pole (with initial outputs)
Zero-Pole (with initial states)
Ready
Inicio
2 MATLAB
13:11

Tema 7. Análisis y diseño asistido por ordenador de sistemas de orientación utilizando Matlab. Simulink



Tema 7. Análisis y diseño asistido por ordenador de sistemas de orientación utilizando Matlab. Simulink

SIMULINK: SCOPE

MATLAB