Simulink Support for VEX Cortex

BEST Robotics 2012

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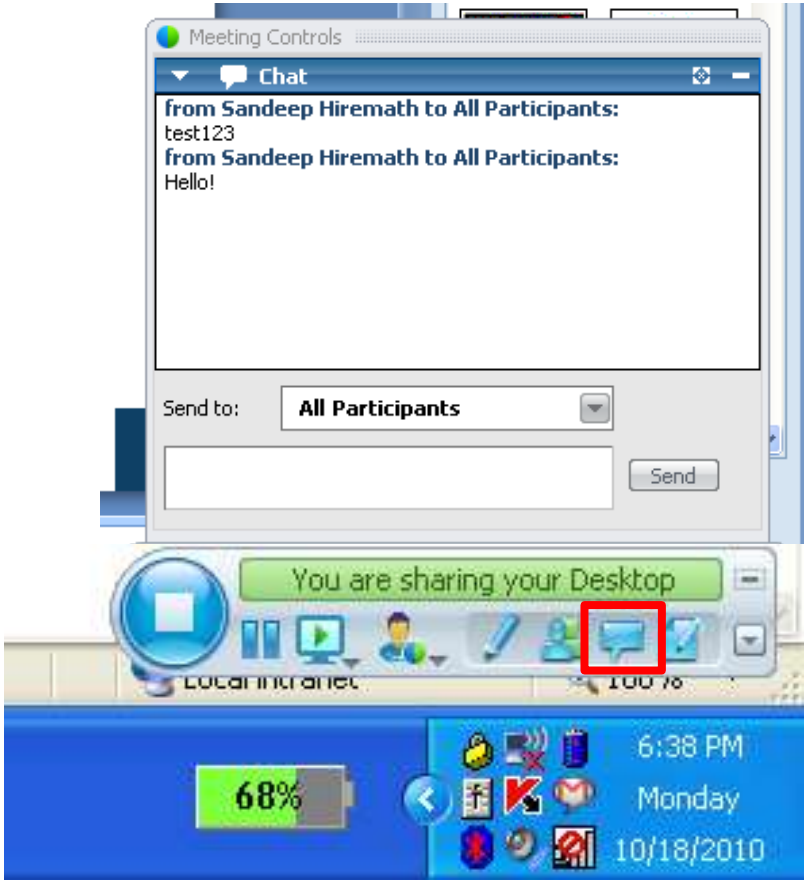
NATIONAL CORPORATE PARTNER

MathWorks®

Boosting Engineering, Science & Technology. BEST

WebEx

- Chat

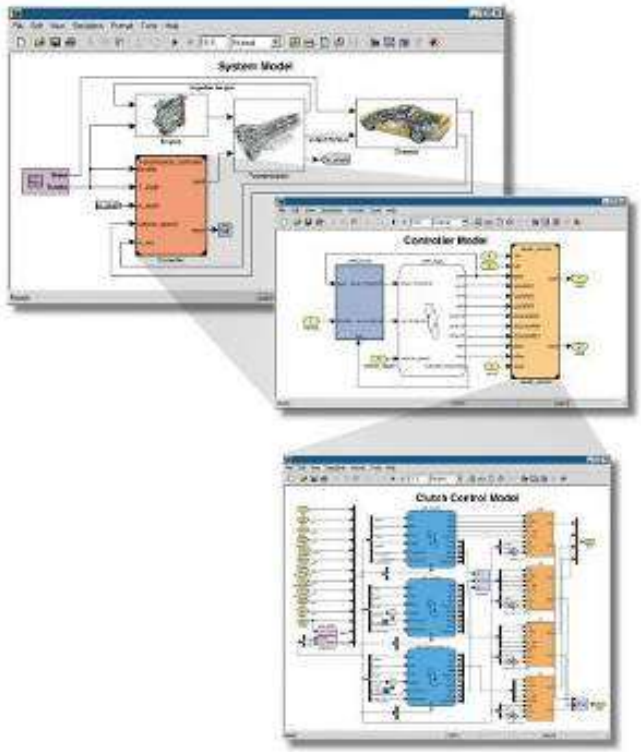

Meeting Controls
Chat
from Sandeep Hiremath to All Participants:
test123
from Sandeep Hiremath to All Participants:
Hello!
Send to:
All Participants
Send
You are sharing your Desktop
68%
6:38 PM
Monday
10/18/2010

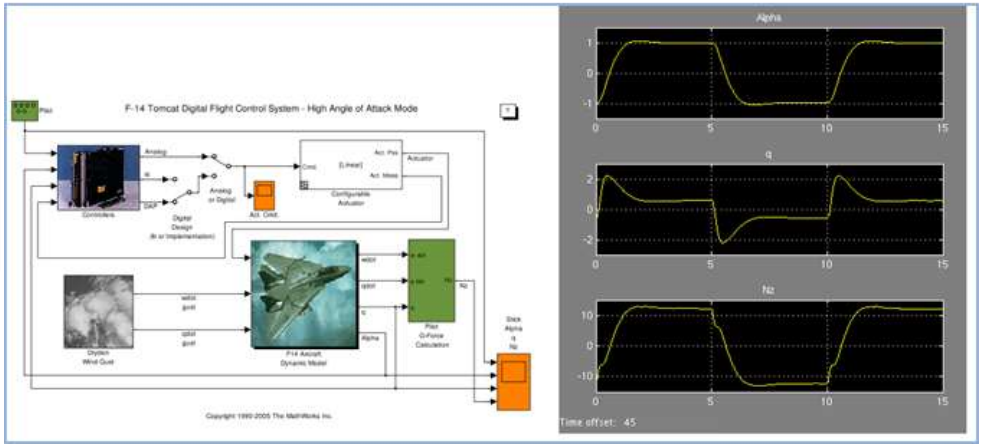
Outline

- Intro to Simulink
- Simulink software support for VEX
  - Launching and Navigating through the software
  - Creating a simple robot program
  - Simulating and Debugging robot programs
  - Advanced Programming
- Access to the software
- Software Installation
- More Training Resources

What is Simulink?

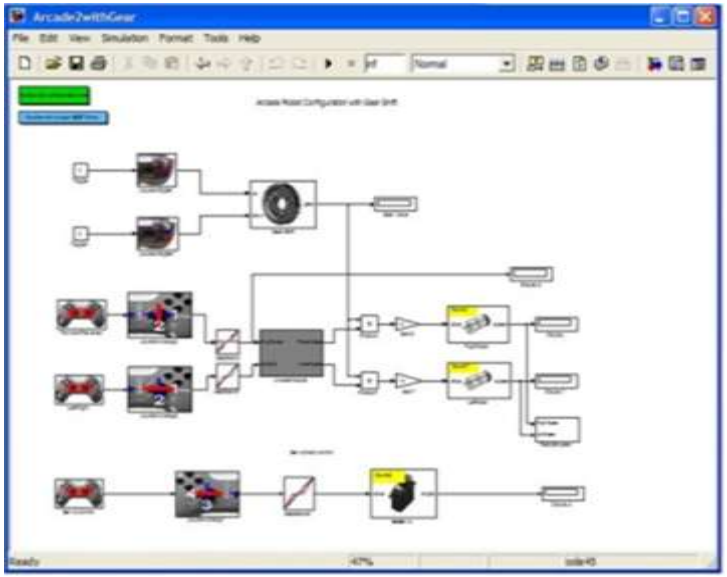
Simulink is a software package for modeling, simulating, and testing the BEST robot program.





Why Simulink?

- Simple Programming Interface
  - Easy to use interface
  - Graphical drag and drop
- More Efficient Design Flow
  - Parallel development
  - No waiting for robot to be built
- Simulation and Debug
  - Test your program without hardware
  - What-if scenarios are easy
- Advanced Programming also
  - Stateflow
  - Embedded MATLAB code

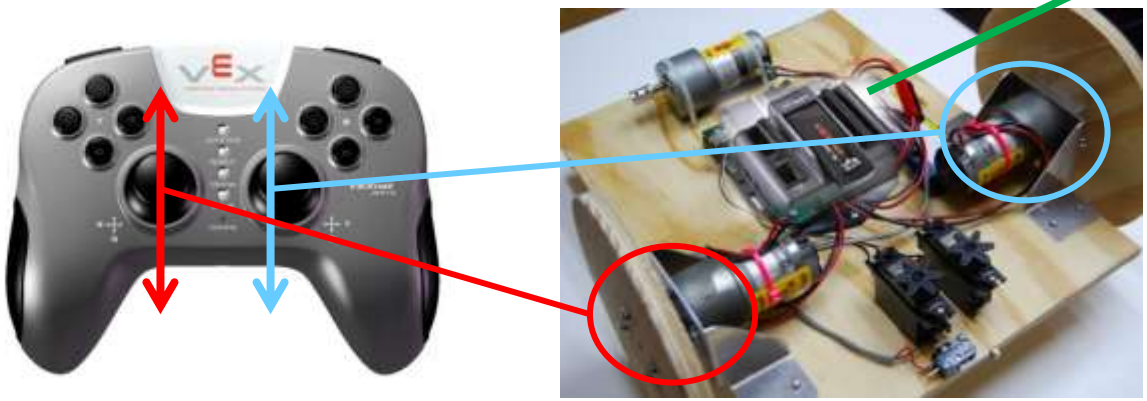


Lets Build!

- Tank Robot Configuration
  - `tank2.mdl` (Example model)

2 vertical axes control the 2 wheels

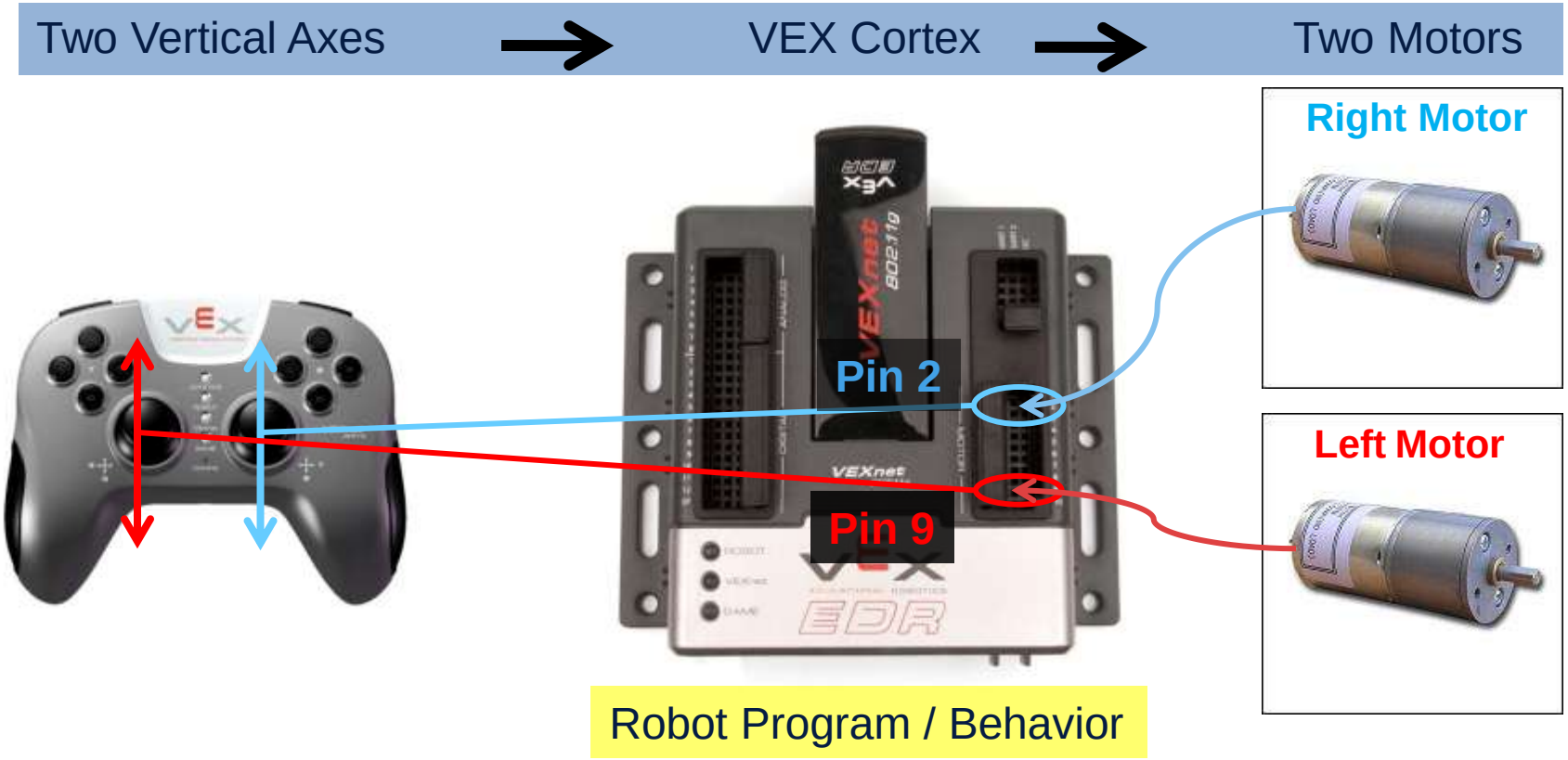
Joystick Control → Your Robot



Robot Program / Behavior

Lets Build!

- Tank Robot Configuration
  - `tank2.mdl` (Example model)

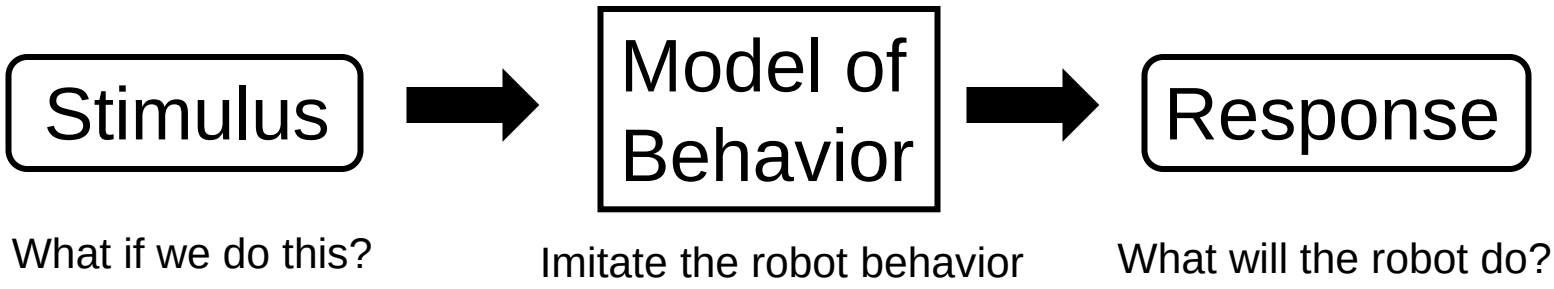


New terms

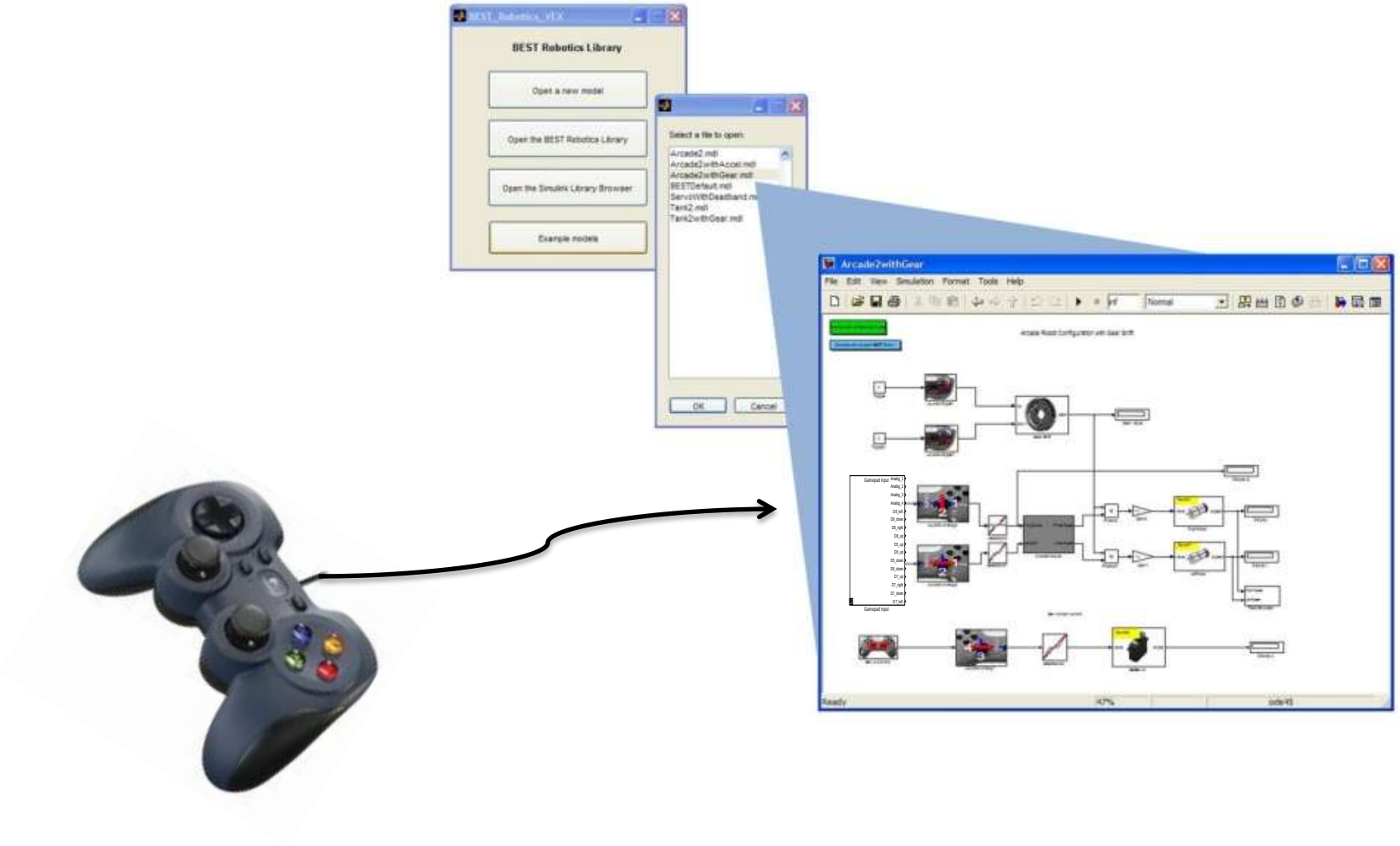
- Simulink model – robot program
- Block – command or function
- Library – group of blocks or commands
- Generate code - Auto generate C code from the Simulink model
- Run a Simulink model – ‘Simulate’ a program on PC

What is Simulation?

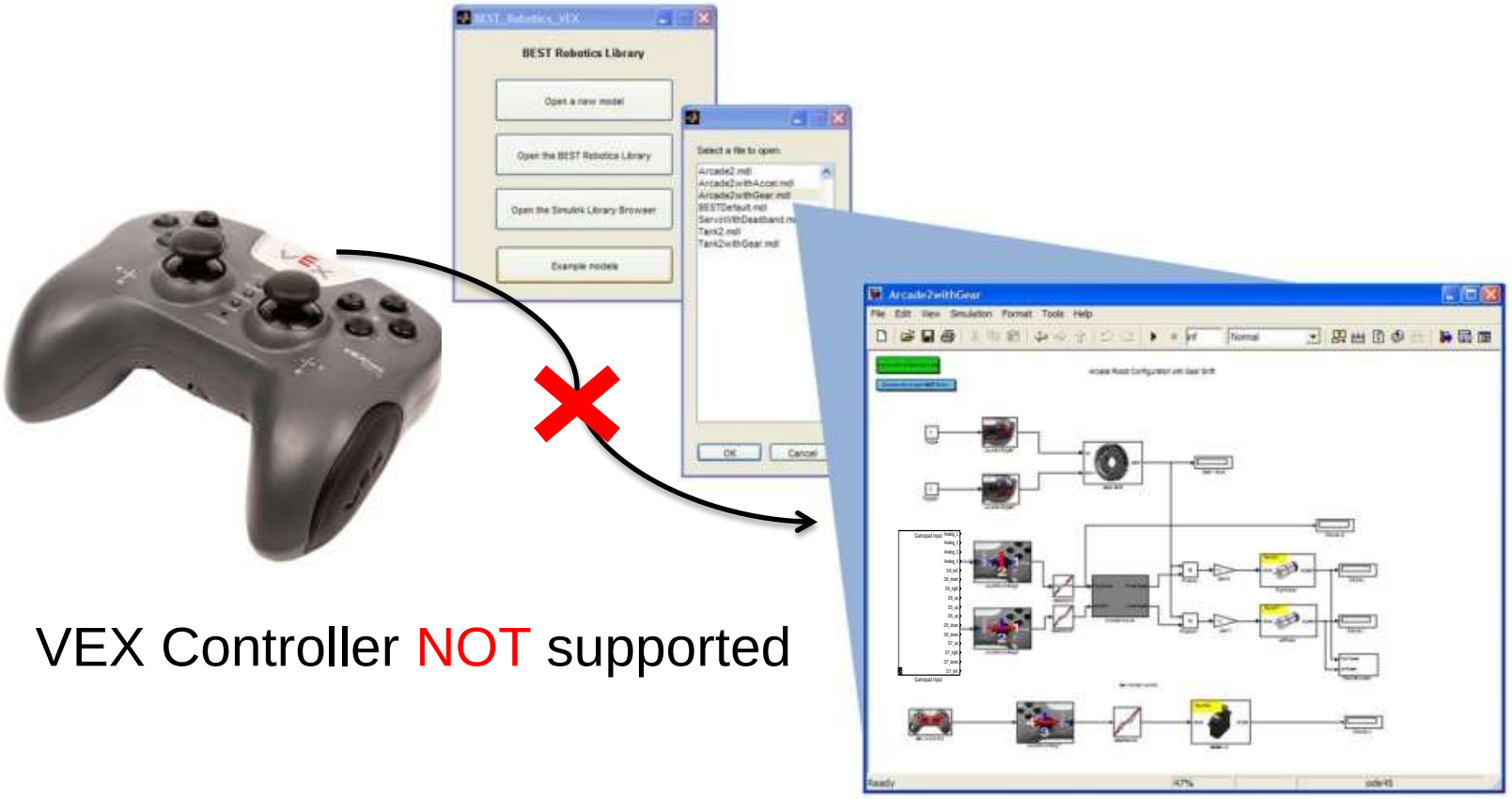
Simulation is the imitation of some real thing, state of affairs, or process.



Gamepad Input to program

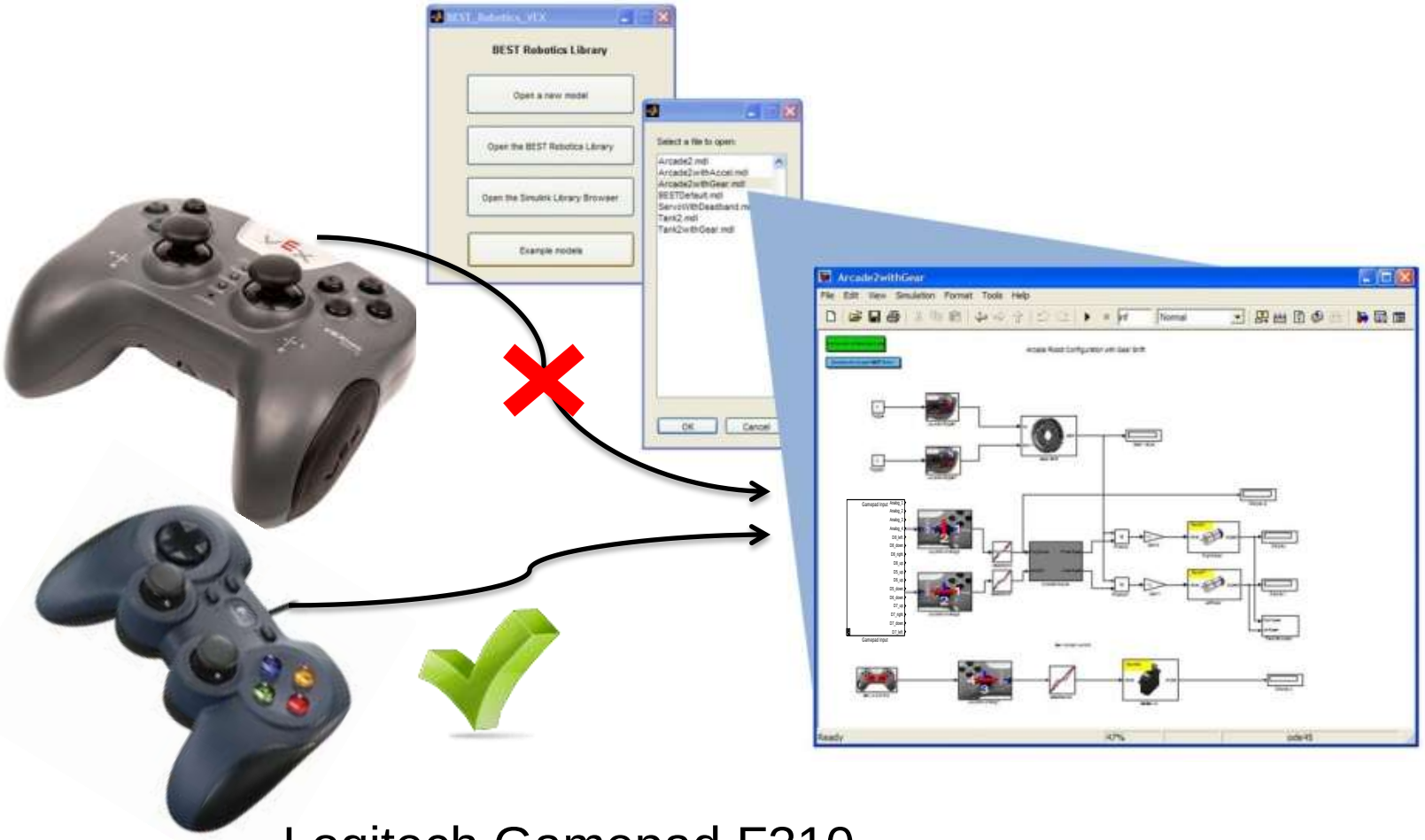


Gamepad Input to Simulink



VEX Controller NOT supported

Gamepad Input to Simulink



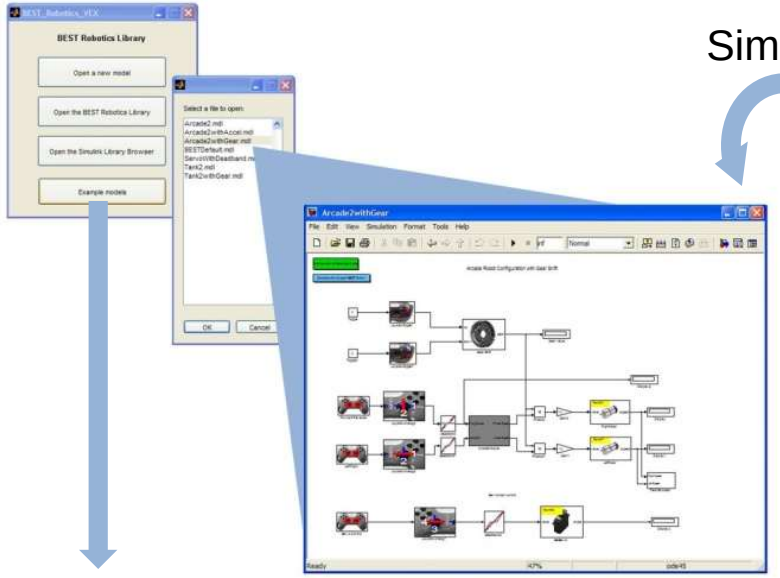
Logitech Gamepad F310

Gamepad Input to Simulink

Xbox Controller!!

(shiremat@mathworks.com)

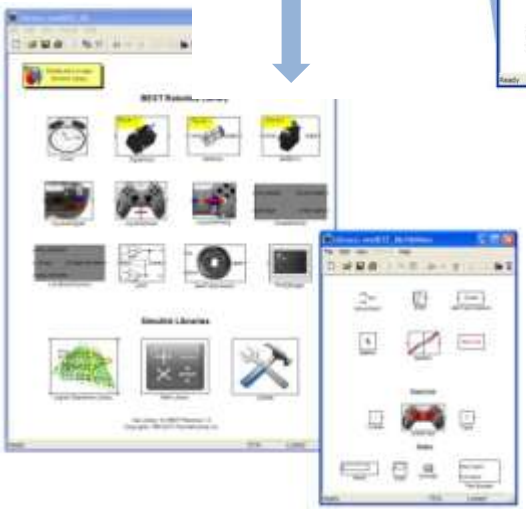
Workflow Summary



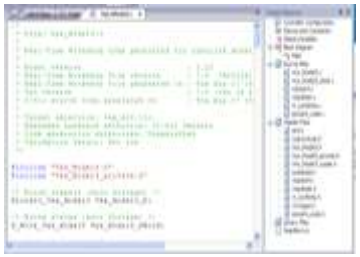
Simulation/Testing

Simulink Model

Hardware

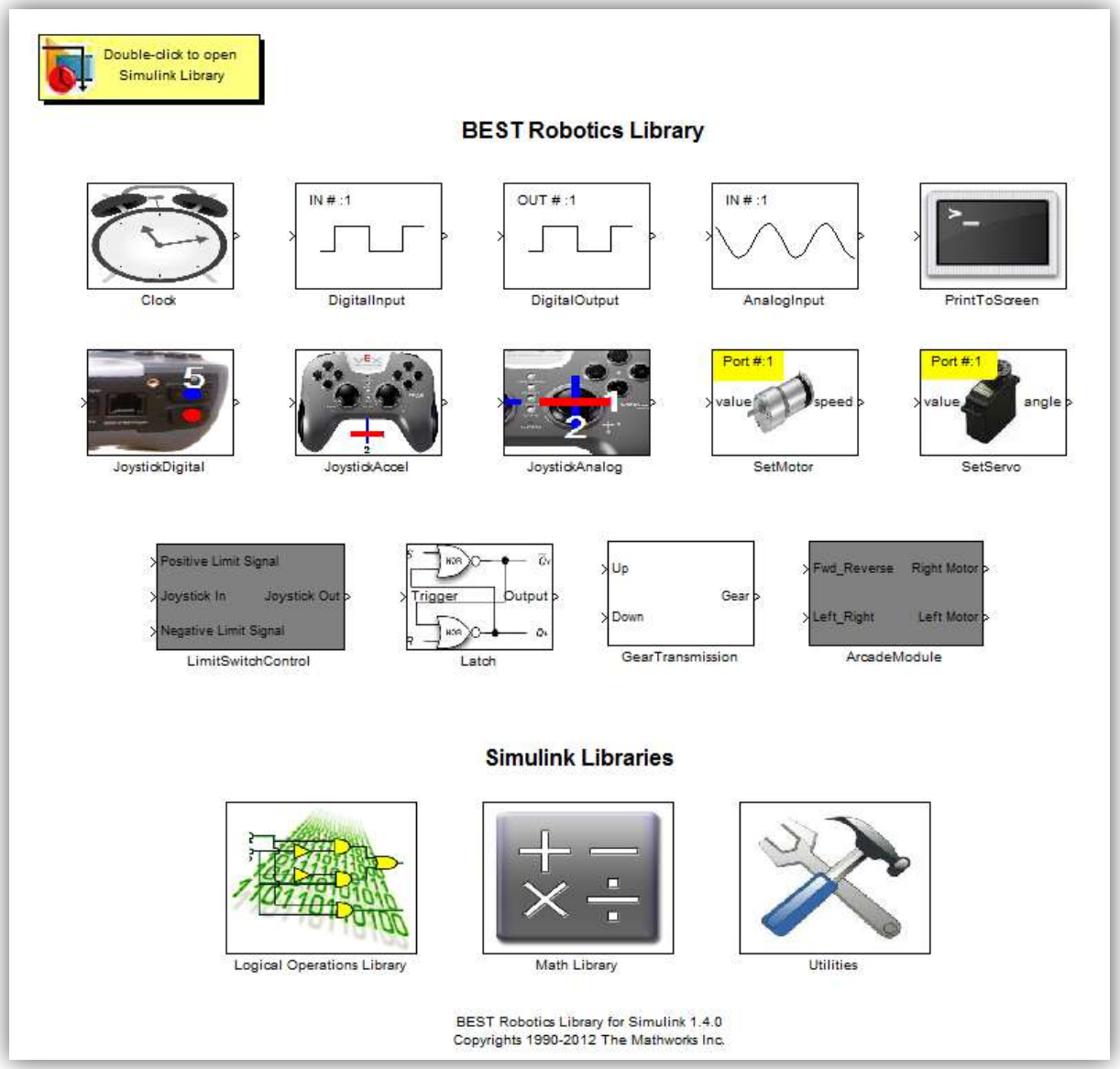


BEST VEX Library



Code Generation- easyC

Overview - BEST Library



Advanced Programming

- Stateflow
  - Demo:
    - Tank2withGear.mdl
    - Aracde2withGear.mdl
  - Blocks:
    - Latch
    - Gear Transmission
- Using Embedded MATLAB function block **New!!**
  - Demo:
    - Teank2withGear_EML.mdl
  - Blocks:
    - Utilities library -> MATLAB Function

Access to software

- **Contact your Hub Directors for DVDs**
- 2 DVDs per team
- Each team has 10 installations
- Label has a URL – Installation instructions
- No online download available
- **No Paperwork**
- **1-year access**

Installation

- Label on the DVD has a web address (URL) and installation/activation keys
- Go to the URL on your PC and **FOLLOW** the instructions there to install the software
- 2 steps = 2 installers (install both as per instructions)
- System Requirements:
  - Windows XP or later version (Vista, 7)
  - Could be 32-bit or 64-bit machines
  - Need 'easy C' to download the program to VEX hardware (easyC Cortex V4)

Training Resources

- Weekly WebEx training – Info on BRI home page
- Video Tutorials available
  - www.bestinc.org > Participants > Resources
- Custom training for teams
- Contact
  - bestrobotics@mathworks.com

Thank you!