MATLAB EXPO 2017

Design-Optimierung eines Rennwagen-Fahrwerks

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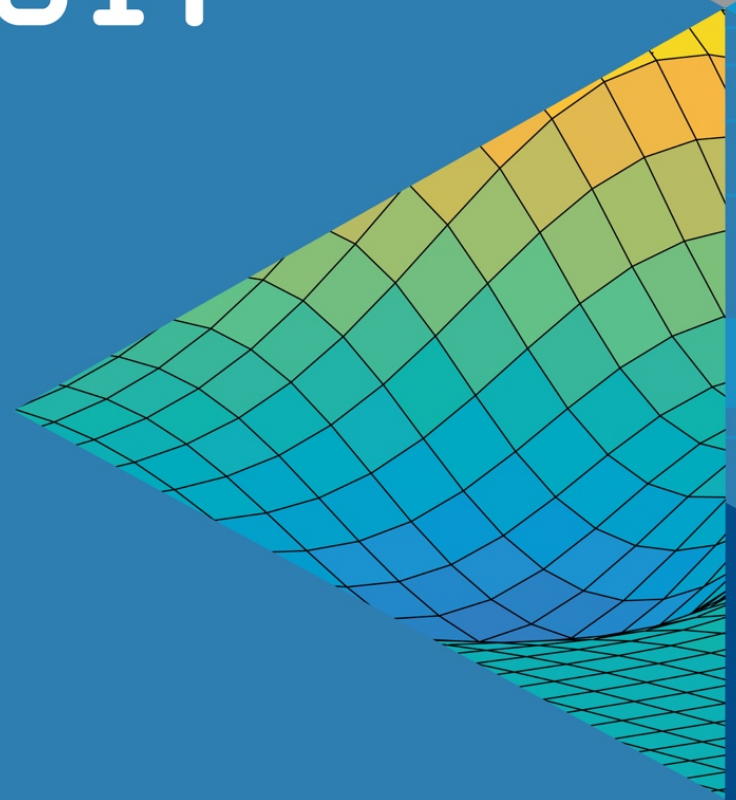
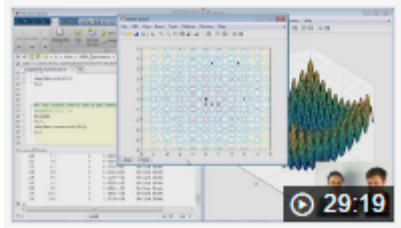


Motivation

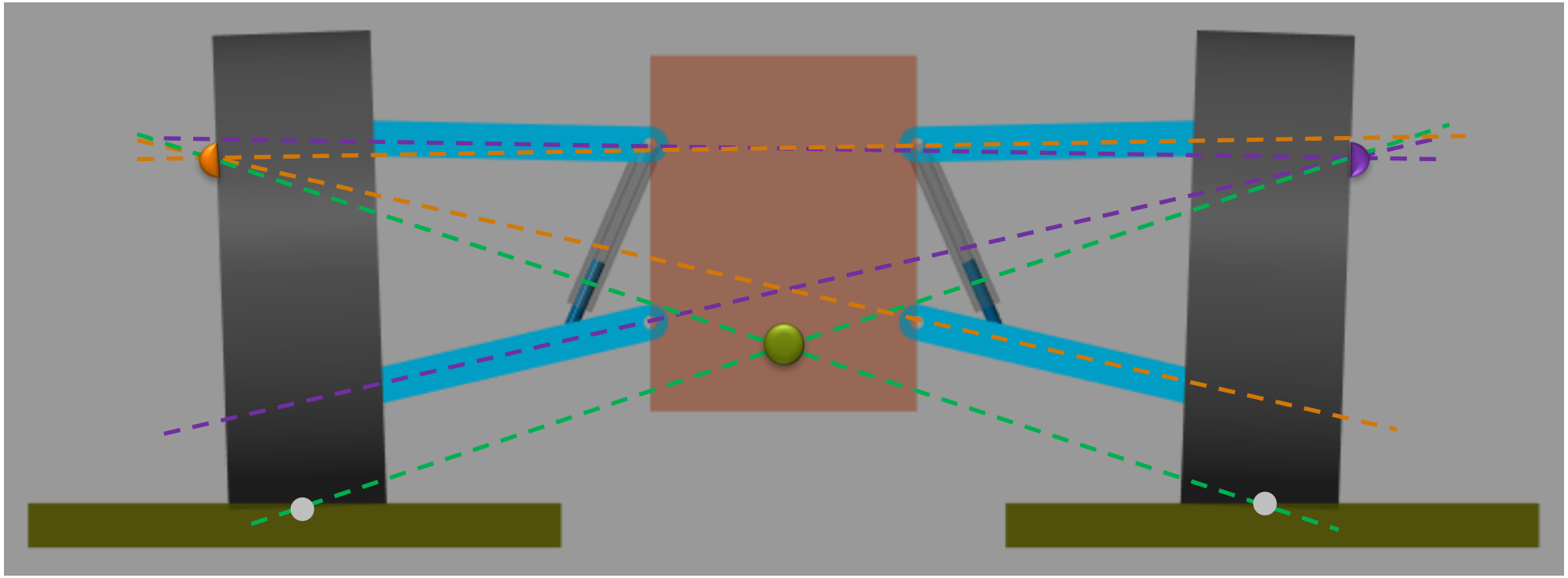
- Racecar development is all about optimizing designs

- Optimization is inherent in MathWorks tools
  - sometimes we just don‘t see it

- Let‘s together browse through a hands-on example
  - Models on File Exchange
  - Video with more details

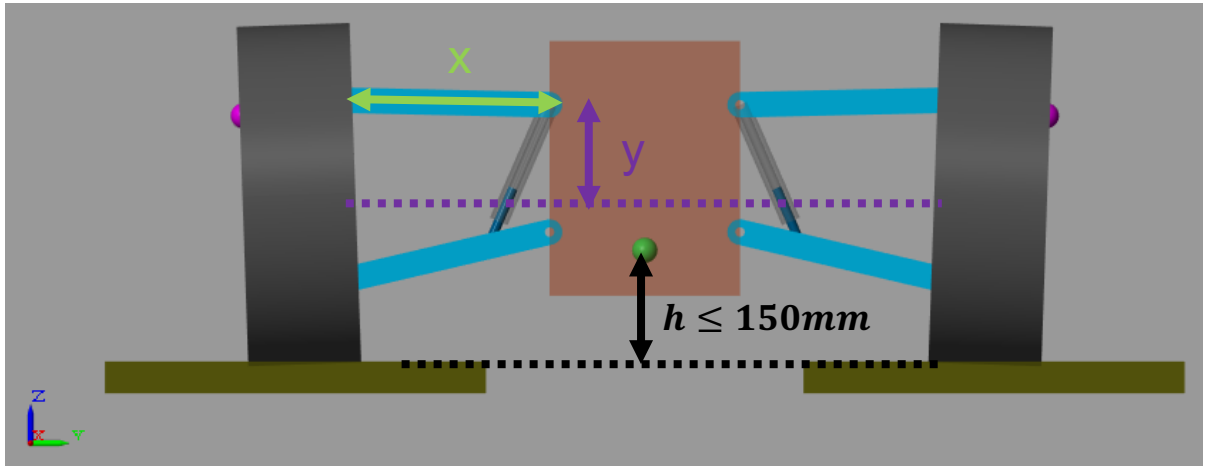


Roll Center



Instant center:
Intersection of upper and lower control arm
Roll center:
Connection of the instant center and the center of the tire-ground contact

Design Goal



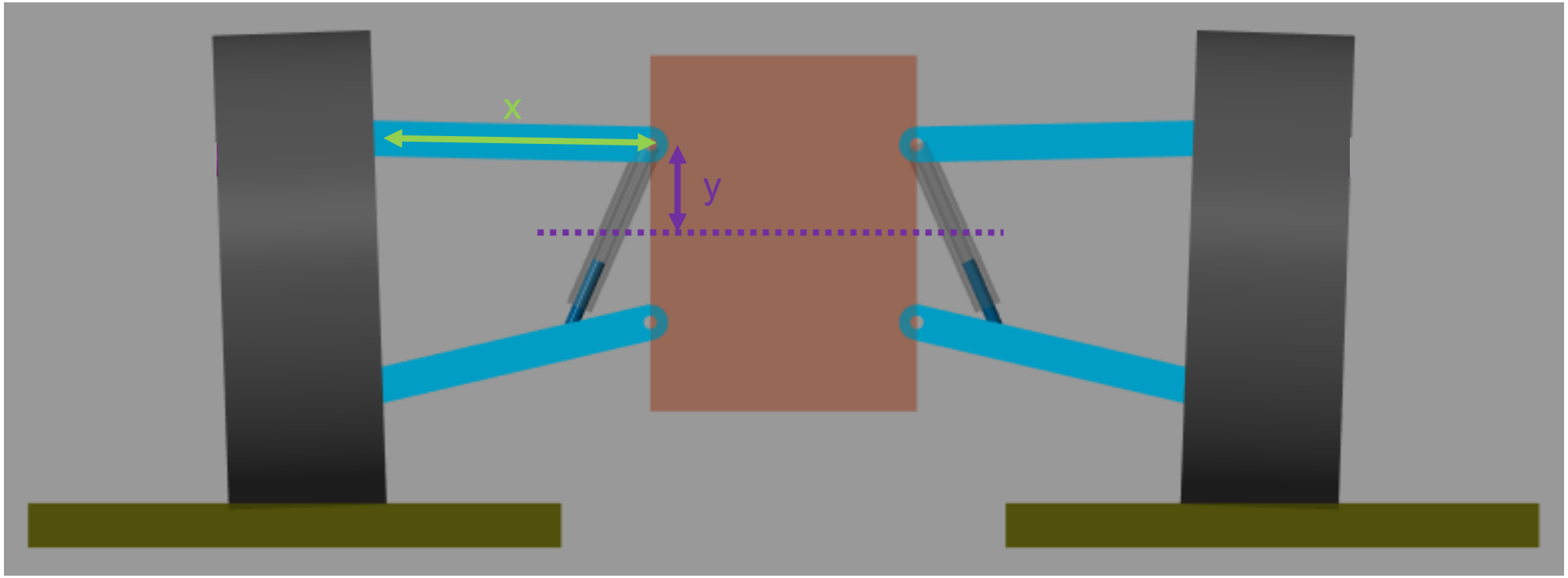
Design goal: Roll center height should

- not exceed 150 mm during the simulation
- Be as close as possible to 150mm

Objective function:

minimize max(**h**(**x**,**y**) - 150 mm, 0)

Design Parameters

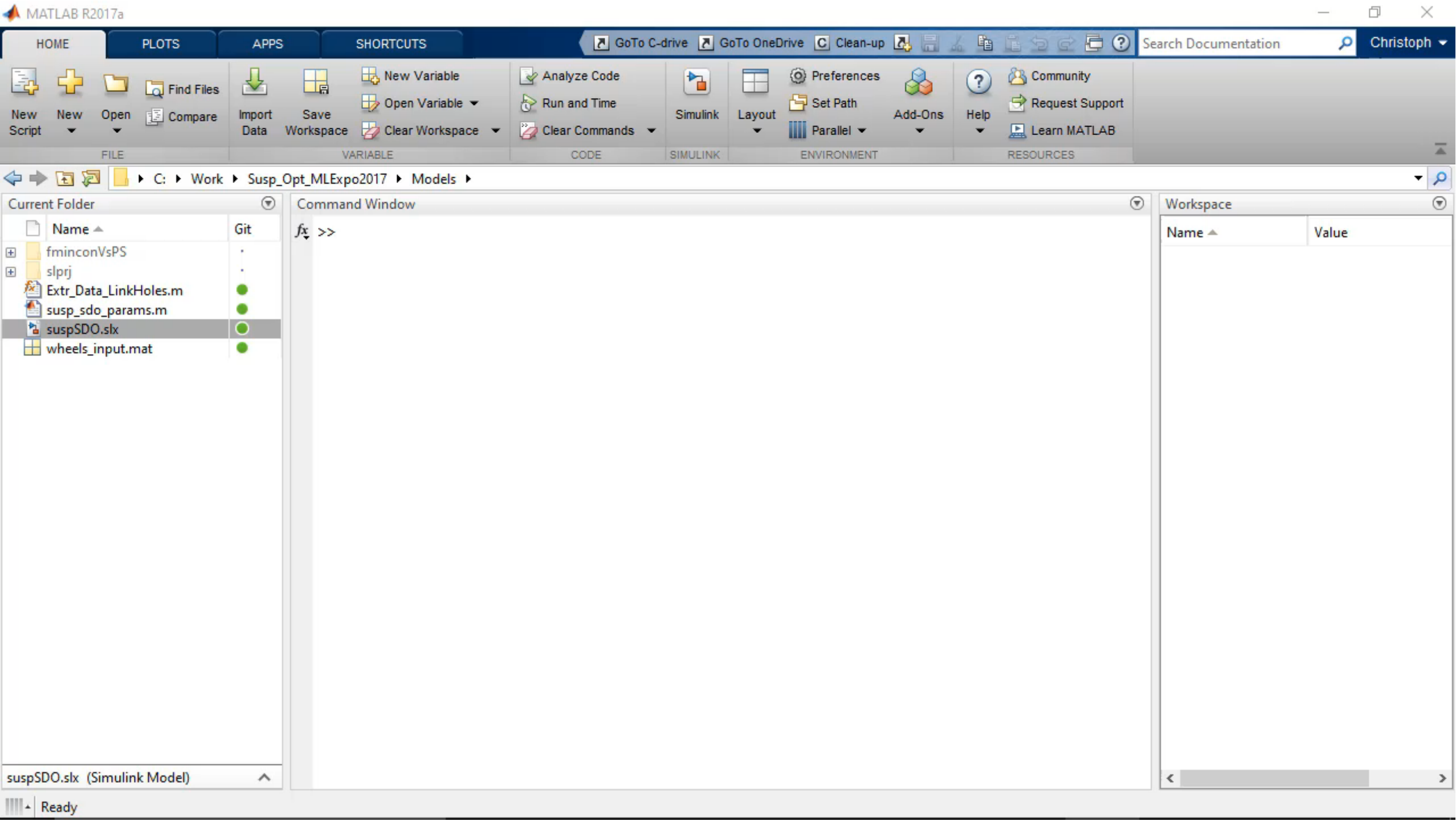


Design variables

x: upper arm length

y: connection point of upper arm at chassis

Software Demonstration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SHORTCUTS
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GoTo OneDrive
Clean-up
Search Documentation
Christoph
New Script
New
Open
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Save Workspace
New Variable
Open Variable
Clear Workspace
Analyze Code
Run and Time
Clear Commands
Simulink
Layout
Preferences
Set Path
Parallel
Add-Ons
Help
Community
Request Support
Learn MATLAB
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suspSDO.slx (Simulink Model)
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Key Takeaways

- Simulink Design Optimization lets you optimize complex systems
- Quick and easy setup of optimization task
- Results are visual and accessible
- Approach can be embedded in the development workflow

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