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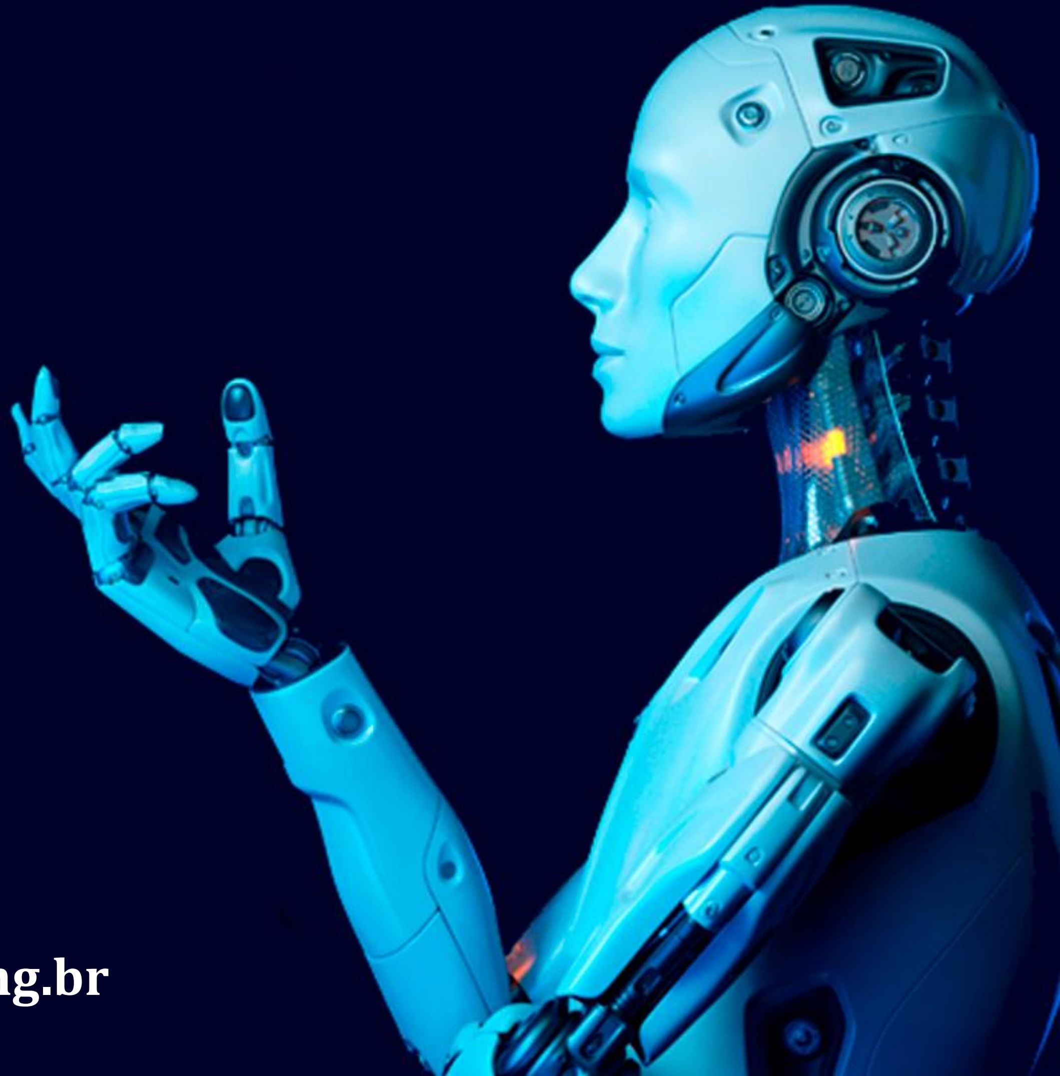
MODEL - BASED DESIGN DRIVEN COMPANY
Modeling for life!

MATLAB & Simulink



Mehdi Dehghan
Application Engineer
mehdi.dehghan@opencadd.eng.br

MATLAB Product Family

Parallel Computing

Parallel Computing Toolbox
MATLAB Parallel Server

AI, Data Science, and Statistics

Deep Learning Toolbox
Statistics and Machine Learning Toolbox
Curve Fitting Toolbox
Text Analytics Toolbox

Math and Optimization

Optimization Toolbox
Global Optimization Toolbox
Symbolic Math Toolbox
Mapping Toolbox
Partial Differential Equation Toolbox

Reporting and Database Access

Database Toolbox
MATLAB Report Generator

Code Generation

MATLAB Coder
Embedded Coder
HDL Coder
HDL Verifier
Filter Design HDL Coder
Fixed-Point Designer
GPU Coder

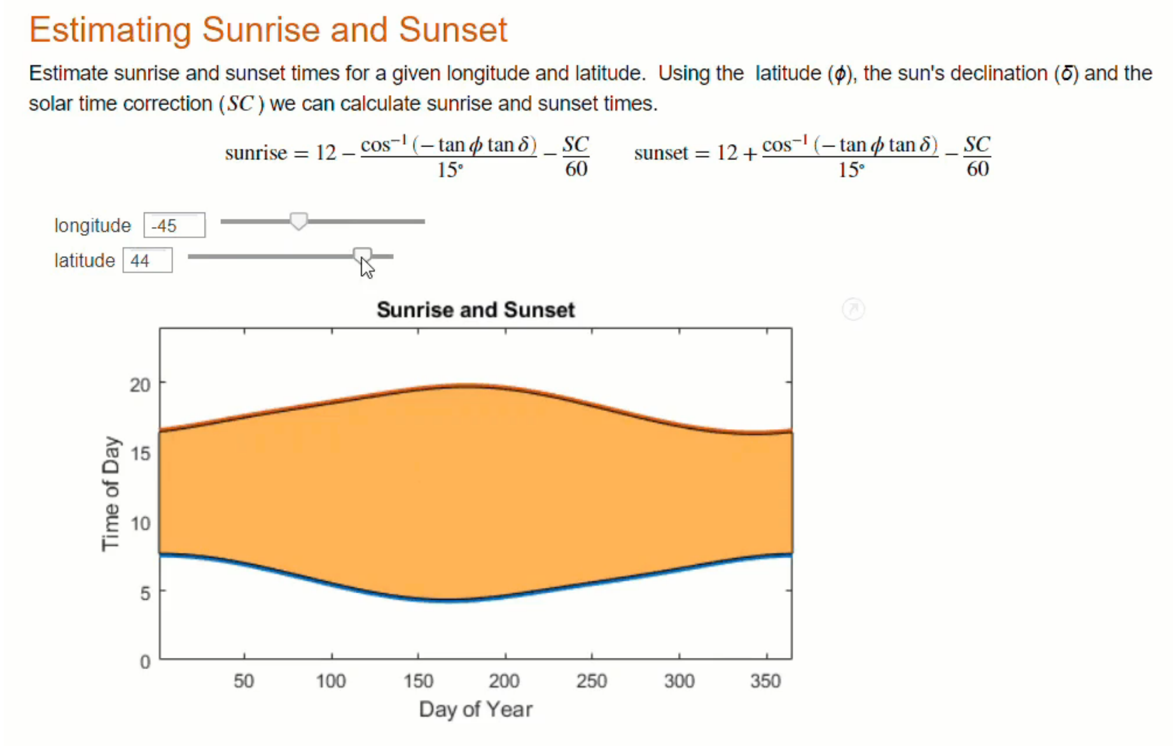
Application Deployment

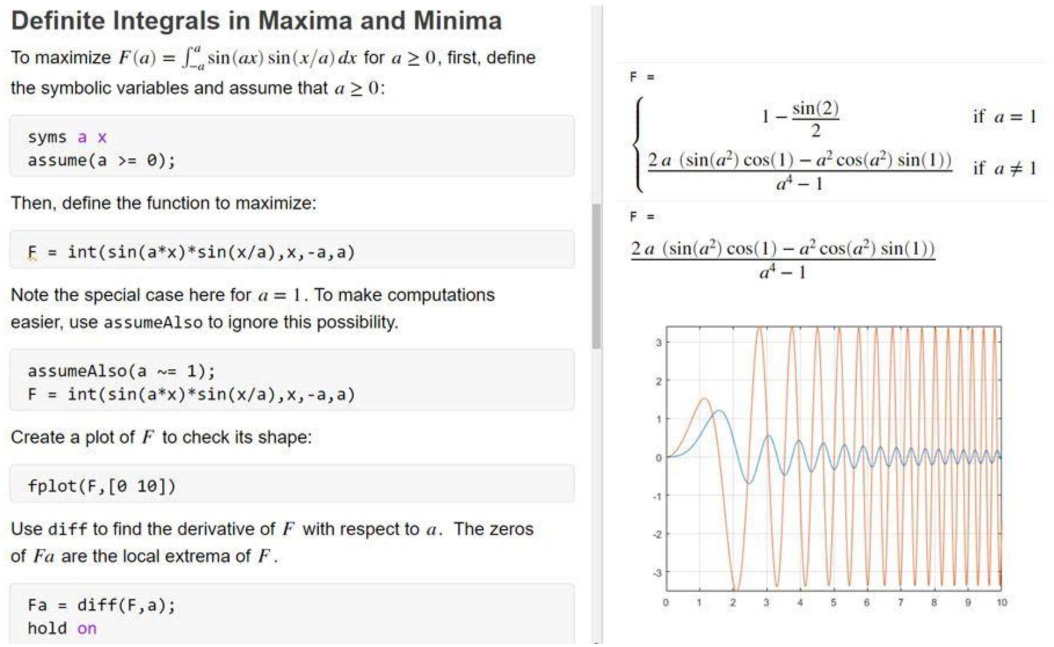
MATLAB Compiler
MATLAB Compiler SDK
MATLAB Production Server
MATLAB Web App Server

Verification, Validation, and Test

Requirements Toolbox
MATLAB Test

MATLAB Live Editor





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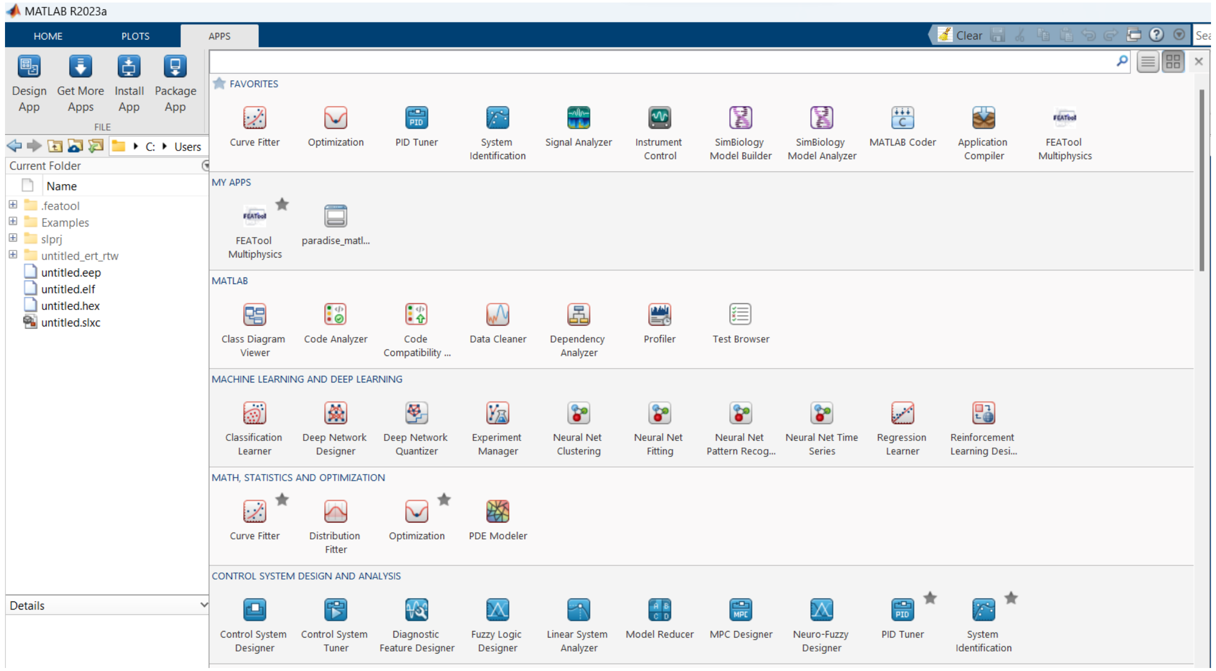
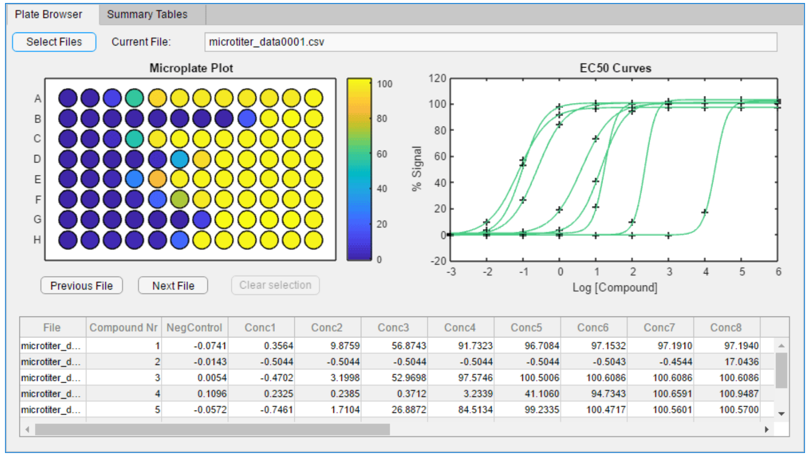
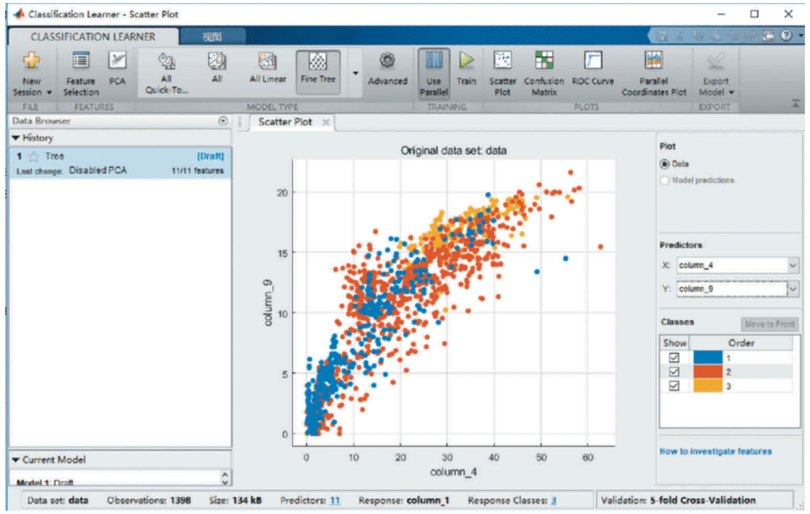
MATLAB Apps

MATLAB® apps are interactive applications written to perform technical computing tasks.







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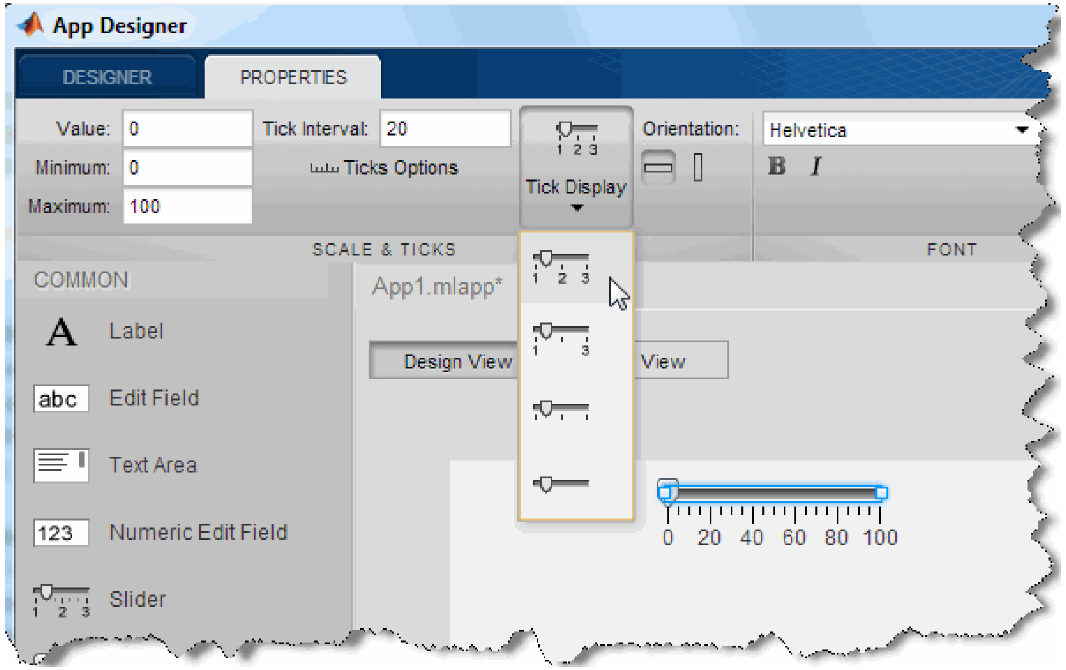
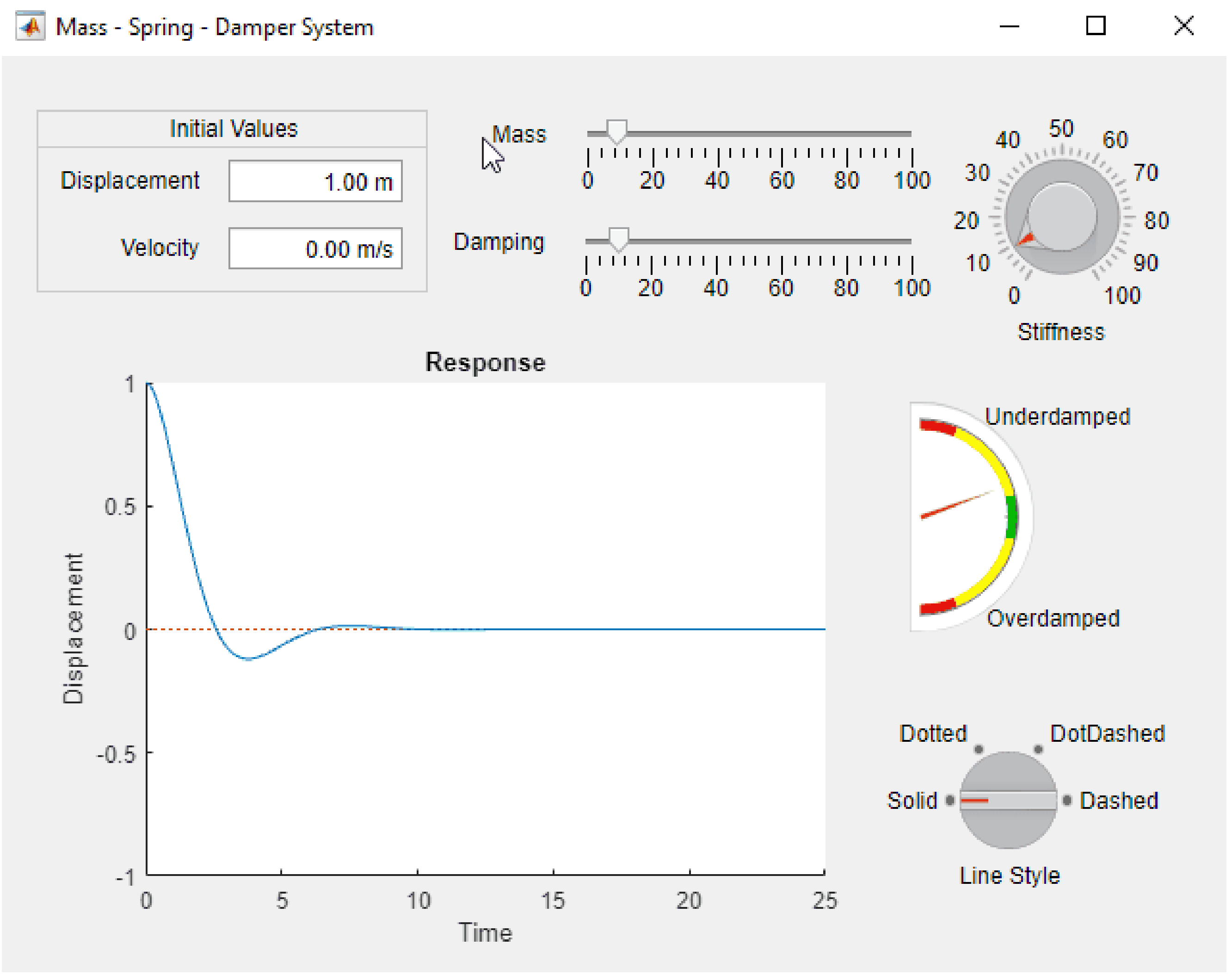
MATLAB App Designer





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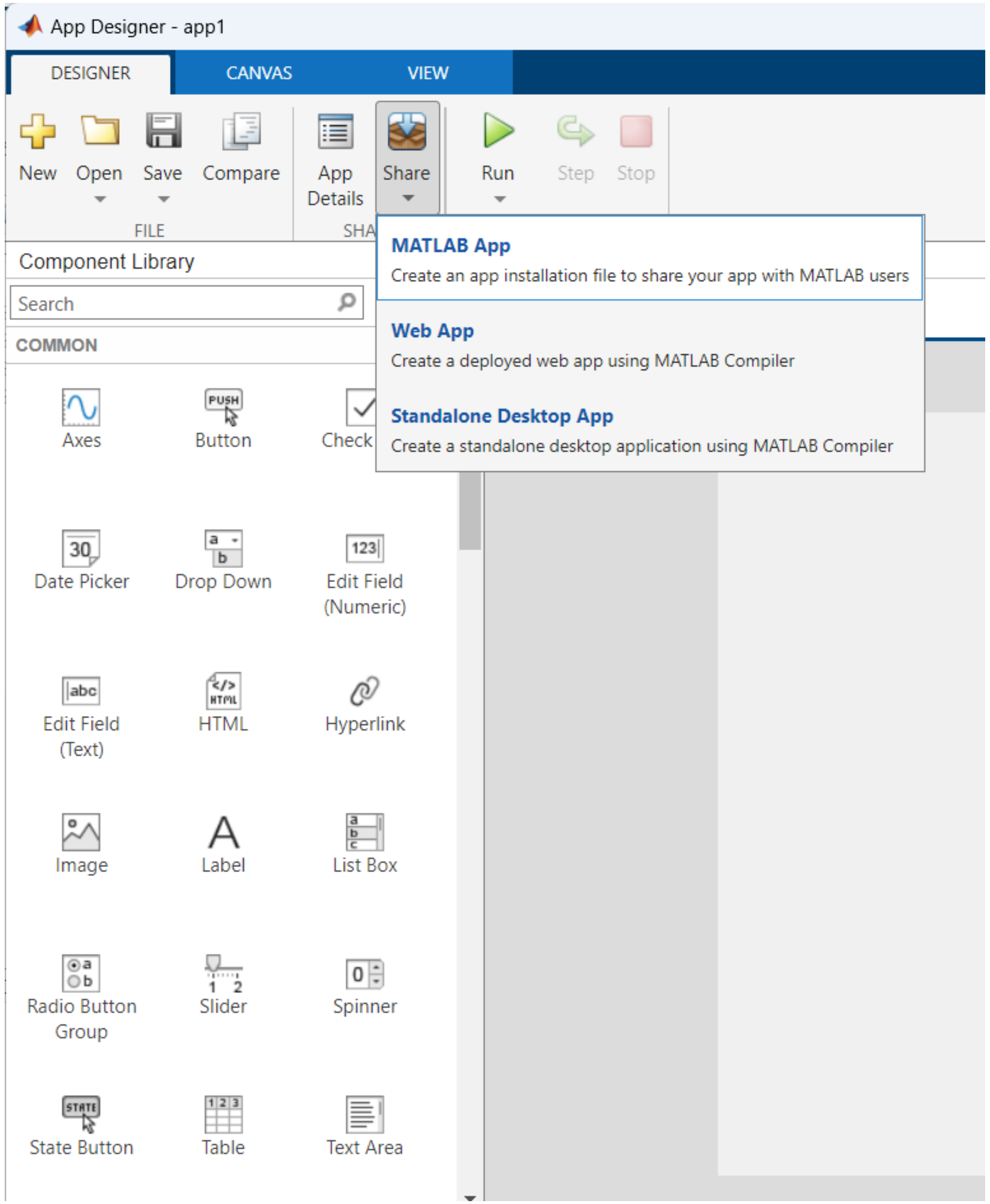
Share App with others

1)MATLAB App

2)Web App

3)Standalone Desktop App



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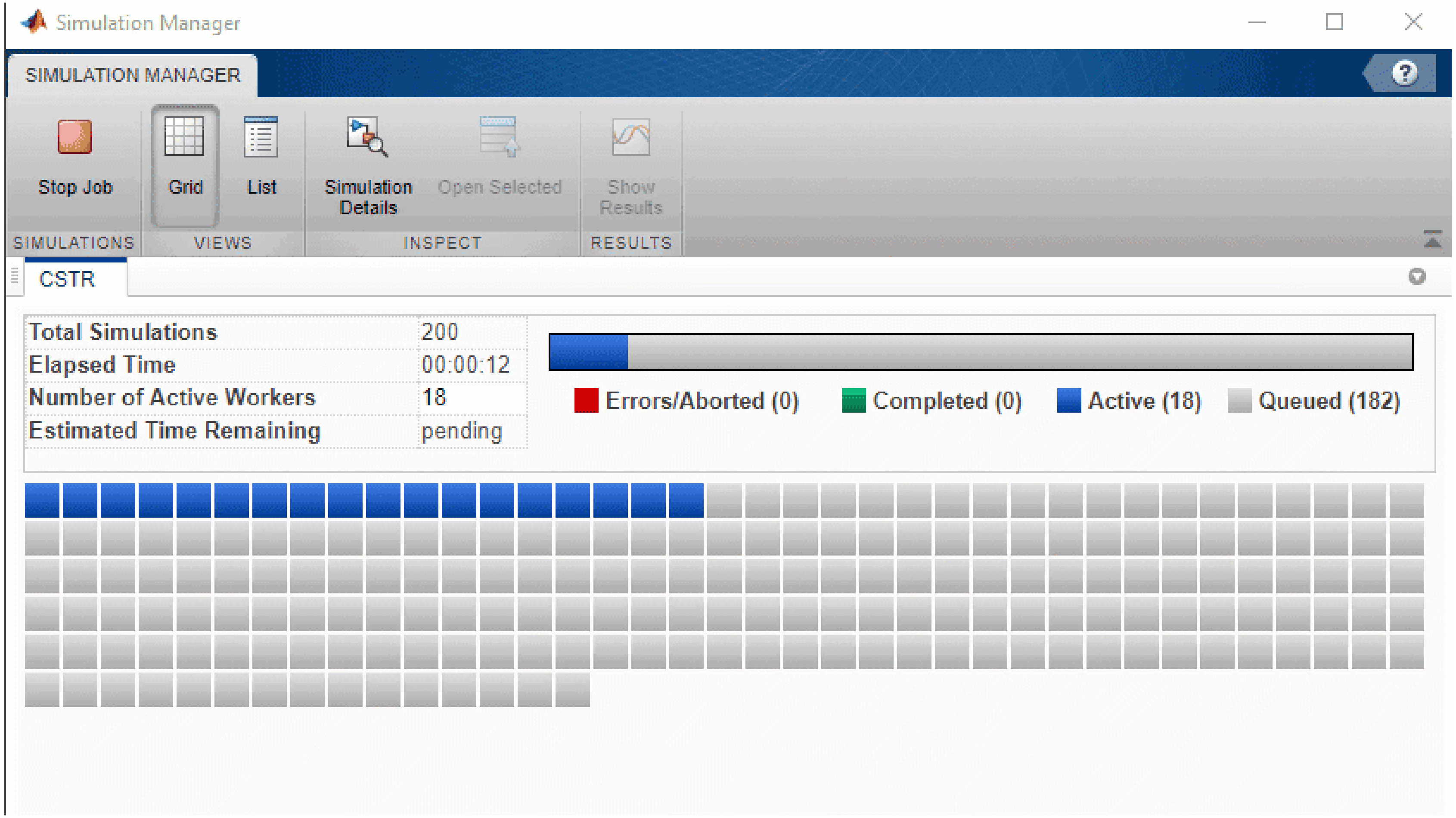
Parallel Computing Toolbox

Parallel Computing Toolbox lets you solve computationally and data-intensive problems using multicore processors, GPUs, and computer clusters.



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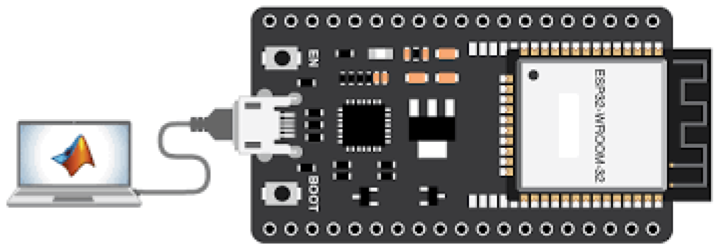
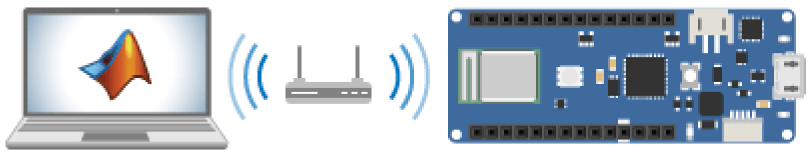
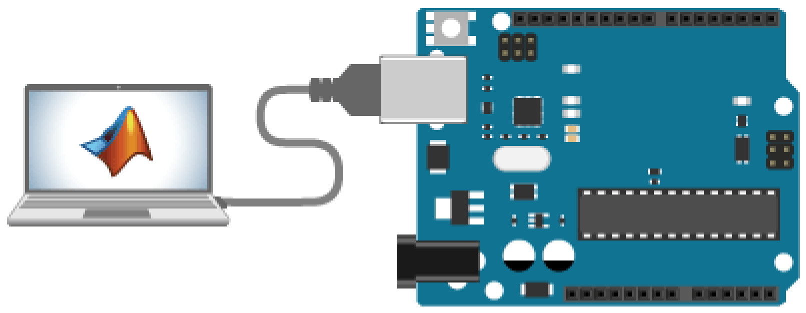
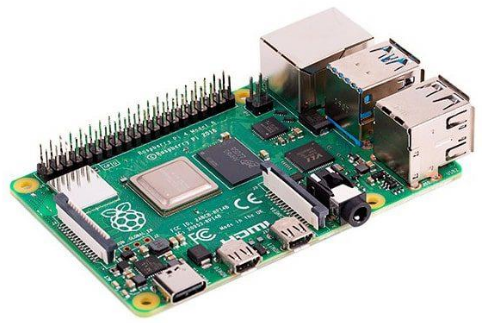
Connect MATLAB to Hardware







Speedgoat



Raspberry PI

National Instrument

Simulink Product Family

Event-Based Modeling

Stateflow
SimEvents

Physical Modeling

Simscape
Simscape Battery
Simscape Driveline
Simscape Electrical
Simscape Fluids
Simscape Multibody

Real-Time Simulation and Testing

Simulink Real-Time
Simulink Desktop Real-Time

Reporting

Simulink Report Generator
Simulink 3D Animation

Systems Engineering

System Composer
Requirements Toolbox

Code Generation

Simulink Coder
Embedded Coder
DDS Blockset
AUTOSAR Blockset
C2000 Microcontroller Blockset
Fixed-Point Designer
Simulink PLC Coder
Simulink Code Inspector
DO Qualification Kit (for DO-178)
IEC Certification Kit (for ISO 26262 and IEC 61508)
HDL Coder
HDL Verifier

Application Deployment

Simulink Compiler

Verification, Validation, and Test

Requirements Toolbox
Simulink Check
Simulink Coverage
Simulink Design Verifier
Simulink Test
Polyspace Access
Polyspace Bug Finder
Polyspace Bug Finder Server
Polyspace Code Prover
Polyspace Code Prover Server
Polyspace Client for Ada
Polyspace Server for Ada

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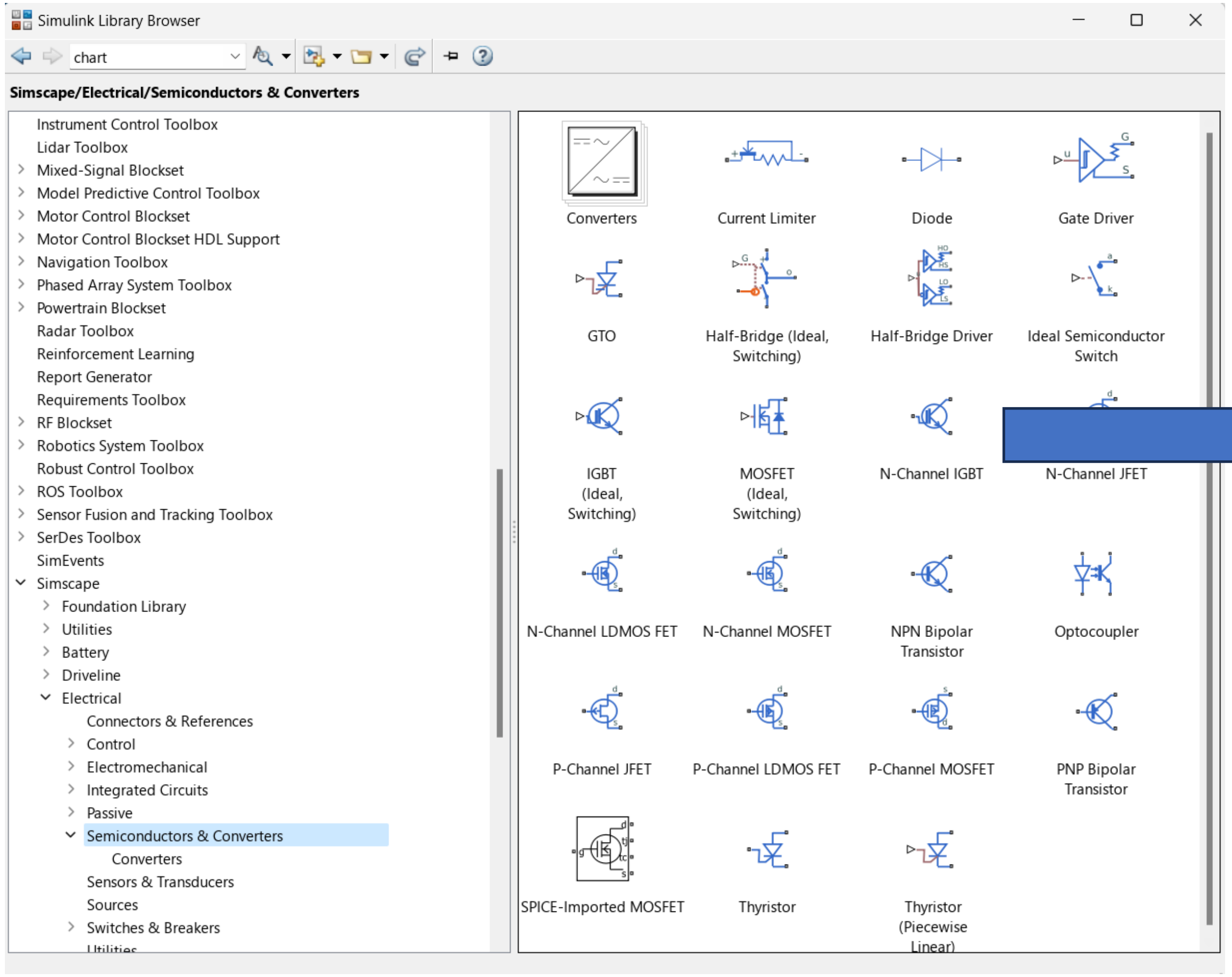
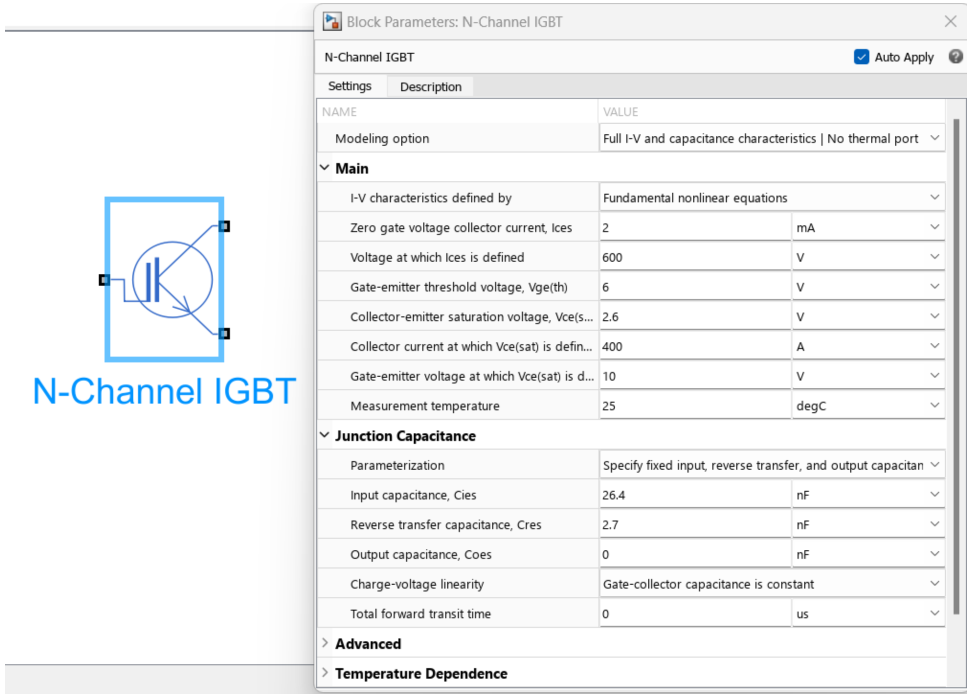
Simulink





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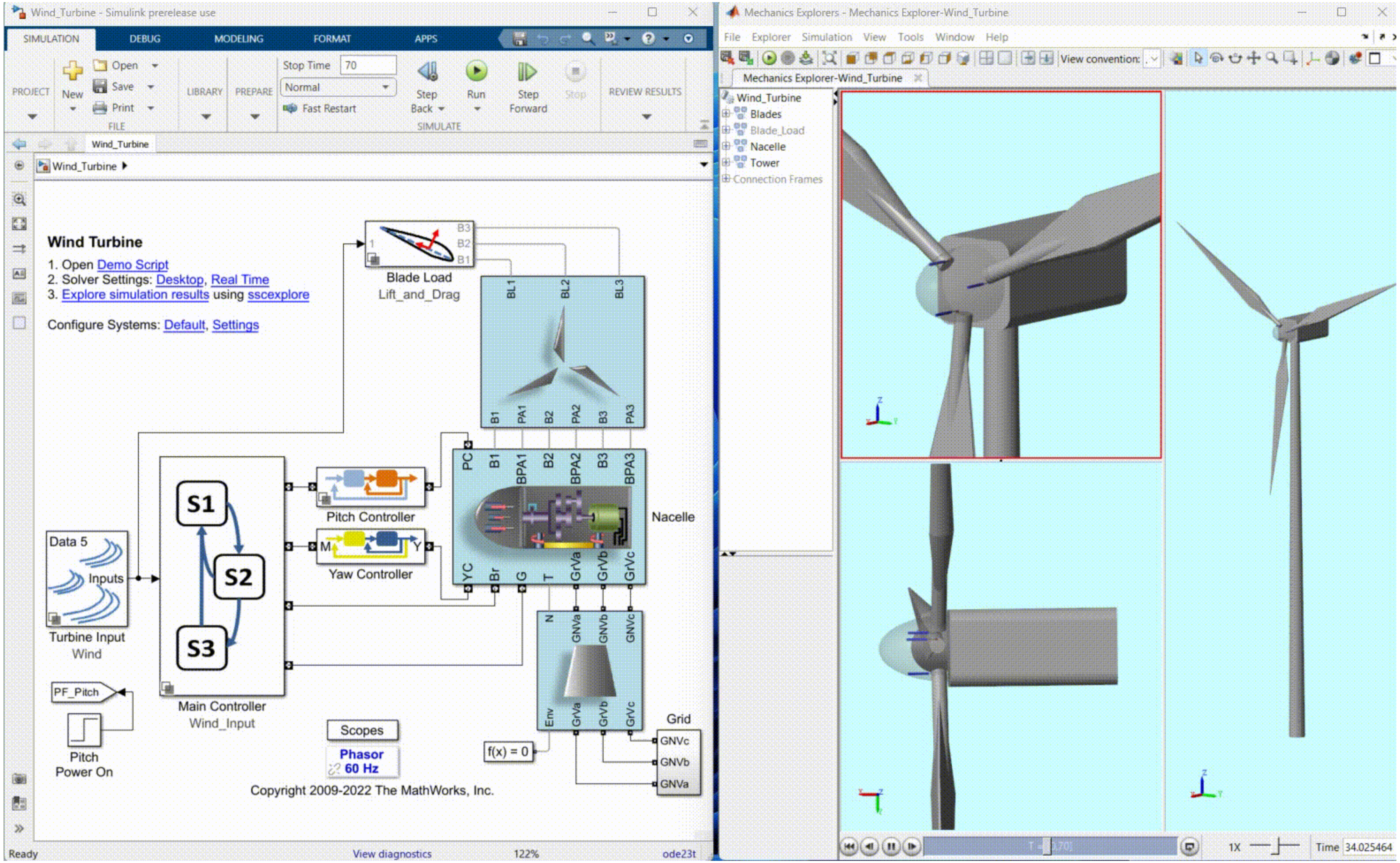
Simulink


Wind_Turbine - Simulink prerelease use
Mechanics Explorers - Mechanics Explorer-Wind_Turbine
Wind Turbine
1. Open Demo Script
2. Solver Settings: Desktop, Real Time
3. Explore simulation results using sscexplore
Configure Systems: Default, Settings
Blade Load
Lift_and_Drag
Pitch Controller
Yaw Controller
Nacelle
Turbine Input
Wind
Main Controller
Wind_Input
Pitch
Power On
Scopes
Phasor
60 Hz
Grid
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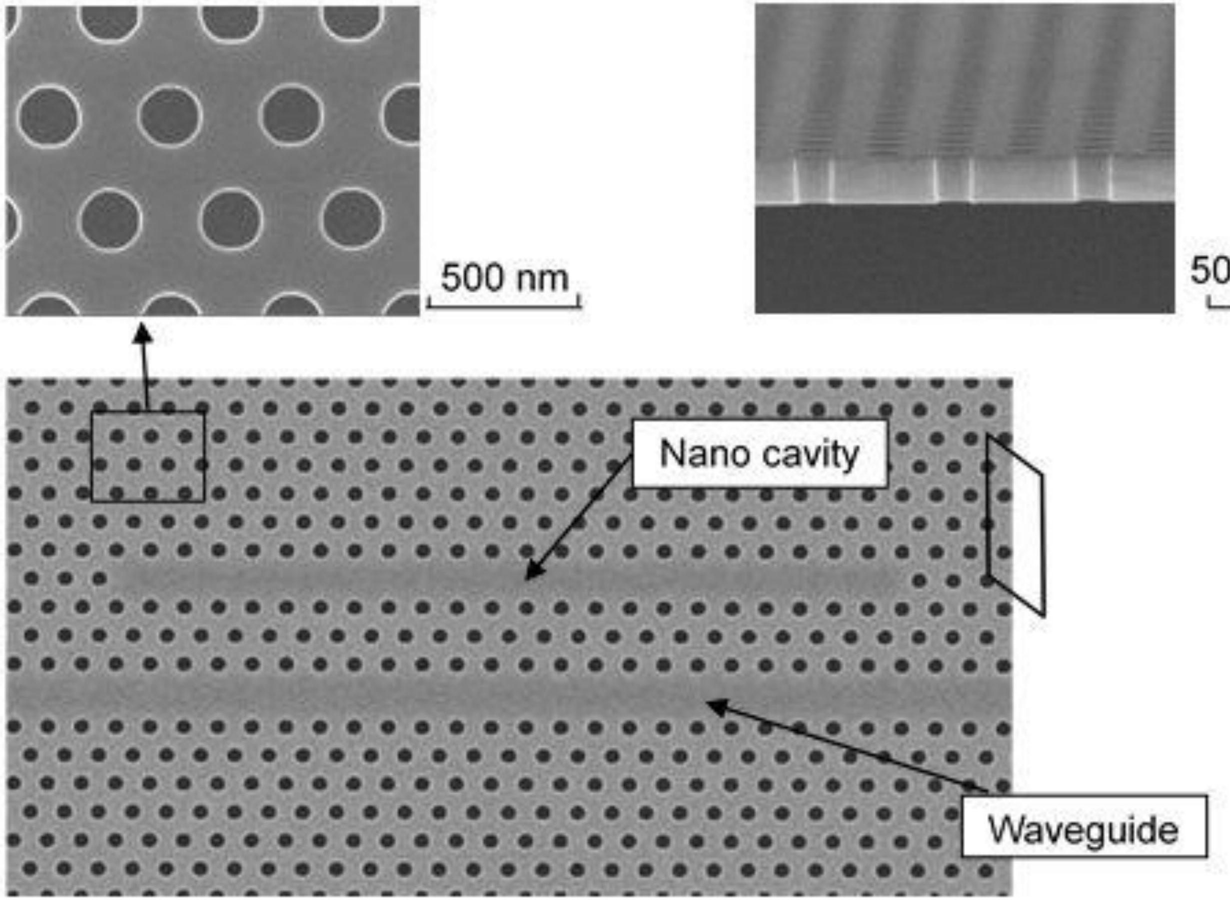
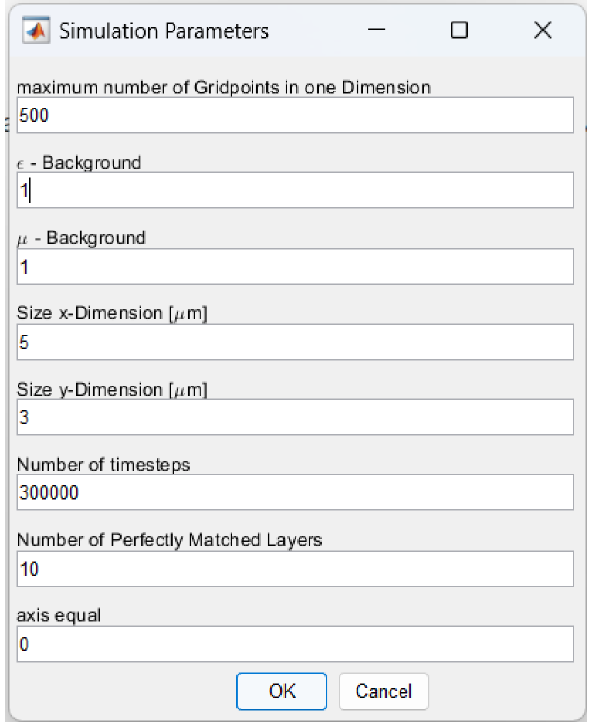
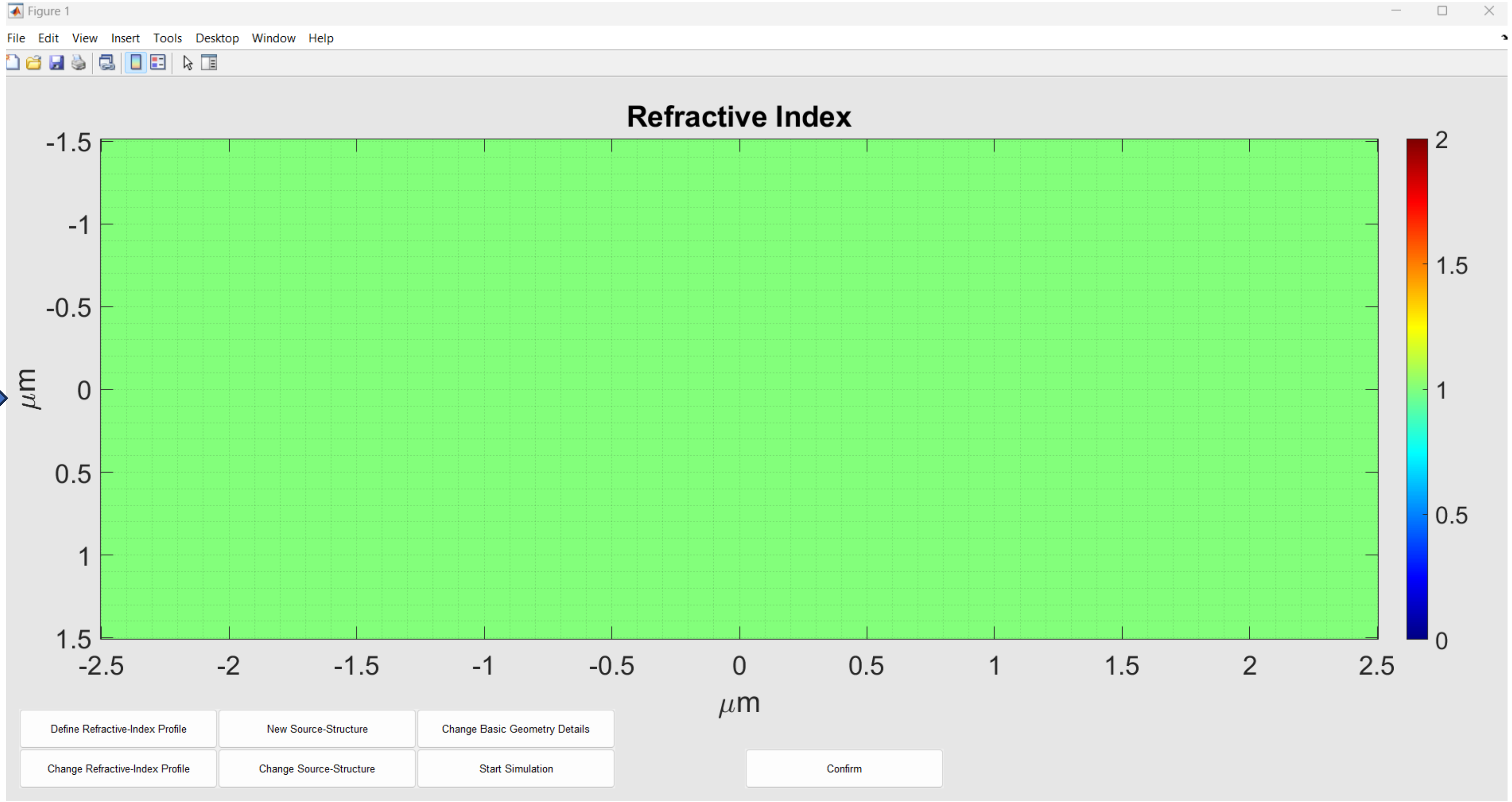
Light Propagation in a Photonic Crystal



https://www.mathworks.com/matlabcentral/fileexchange/40093-interactive-simulation-toolbox-for-optics

Light Propagation in a Photonic Crystal





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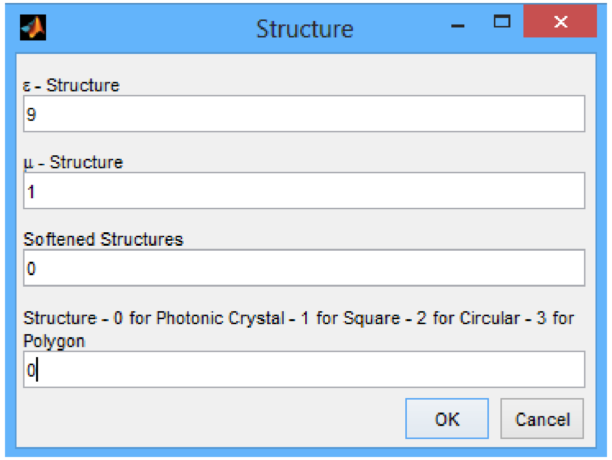
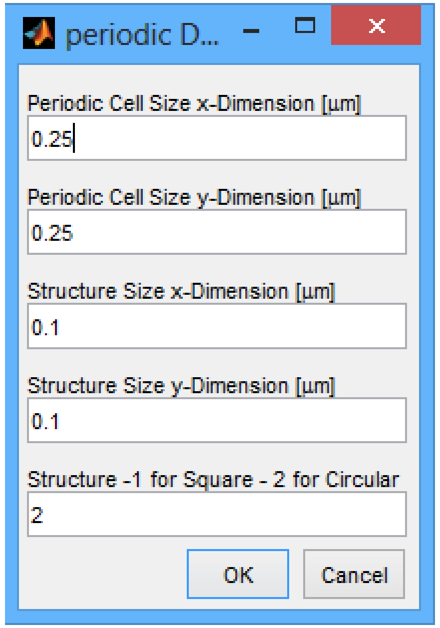
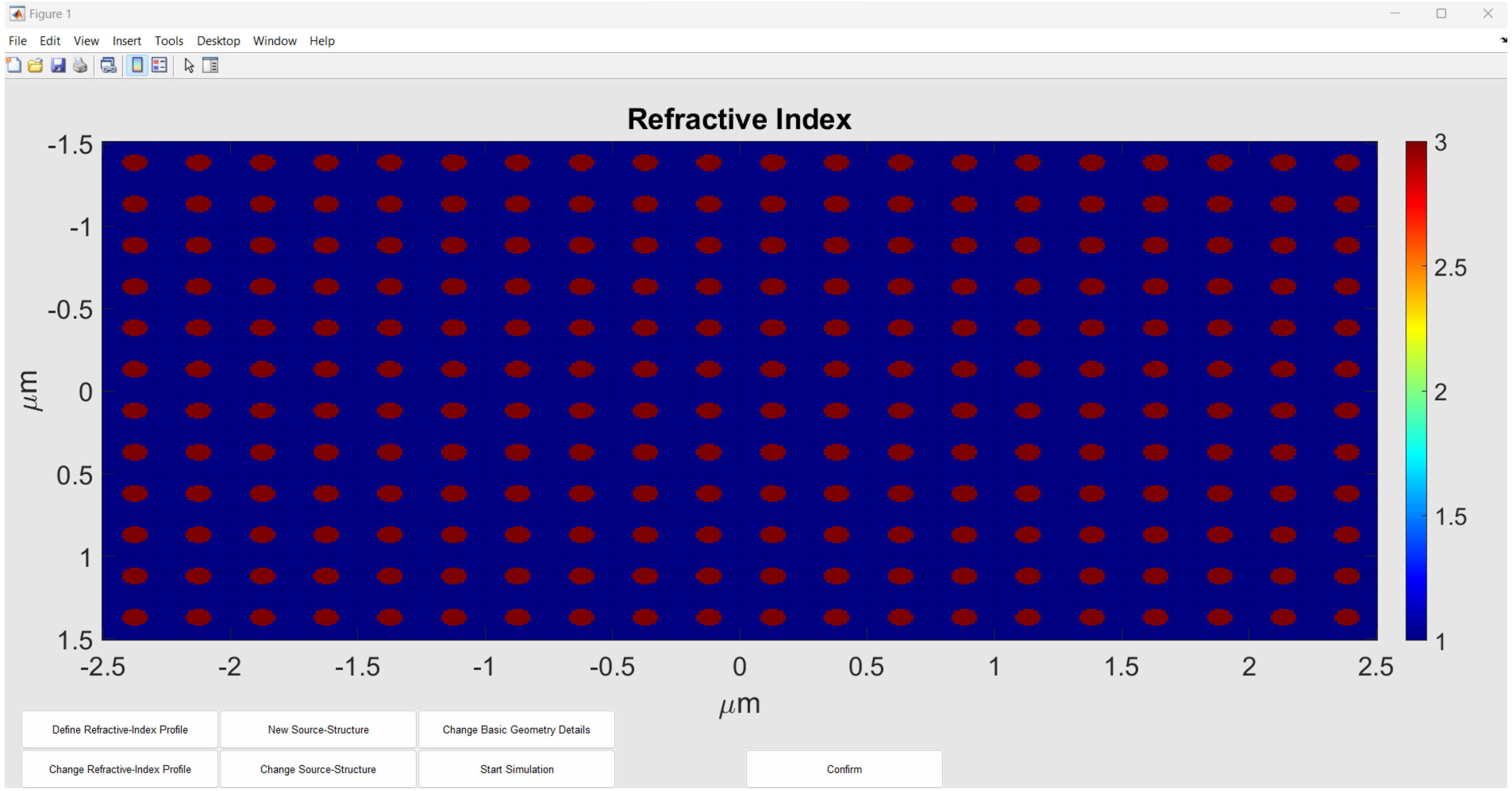
Light Propagation in a Photonic Crystal







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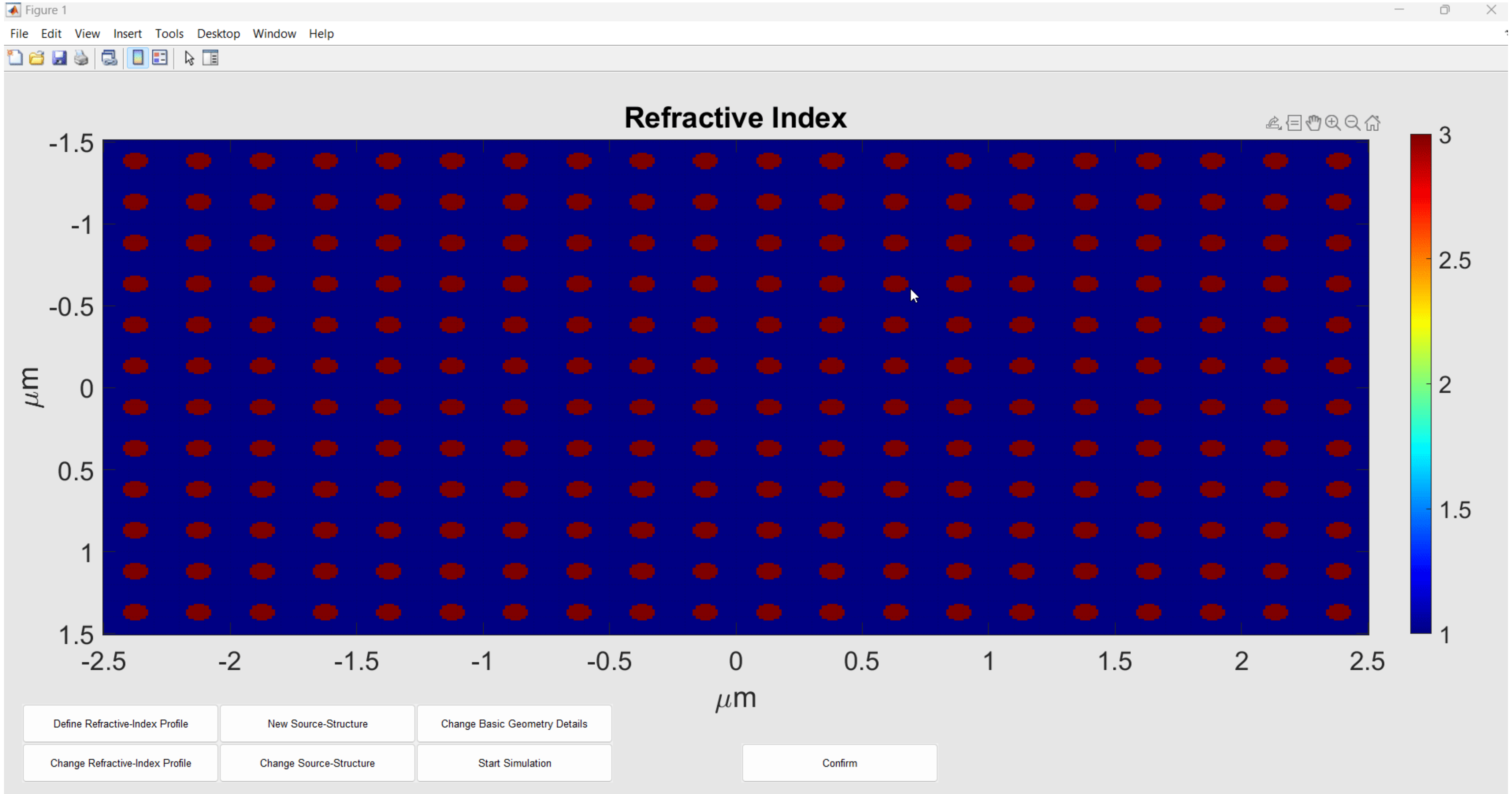
Light Propagation in a Photonic Crystal



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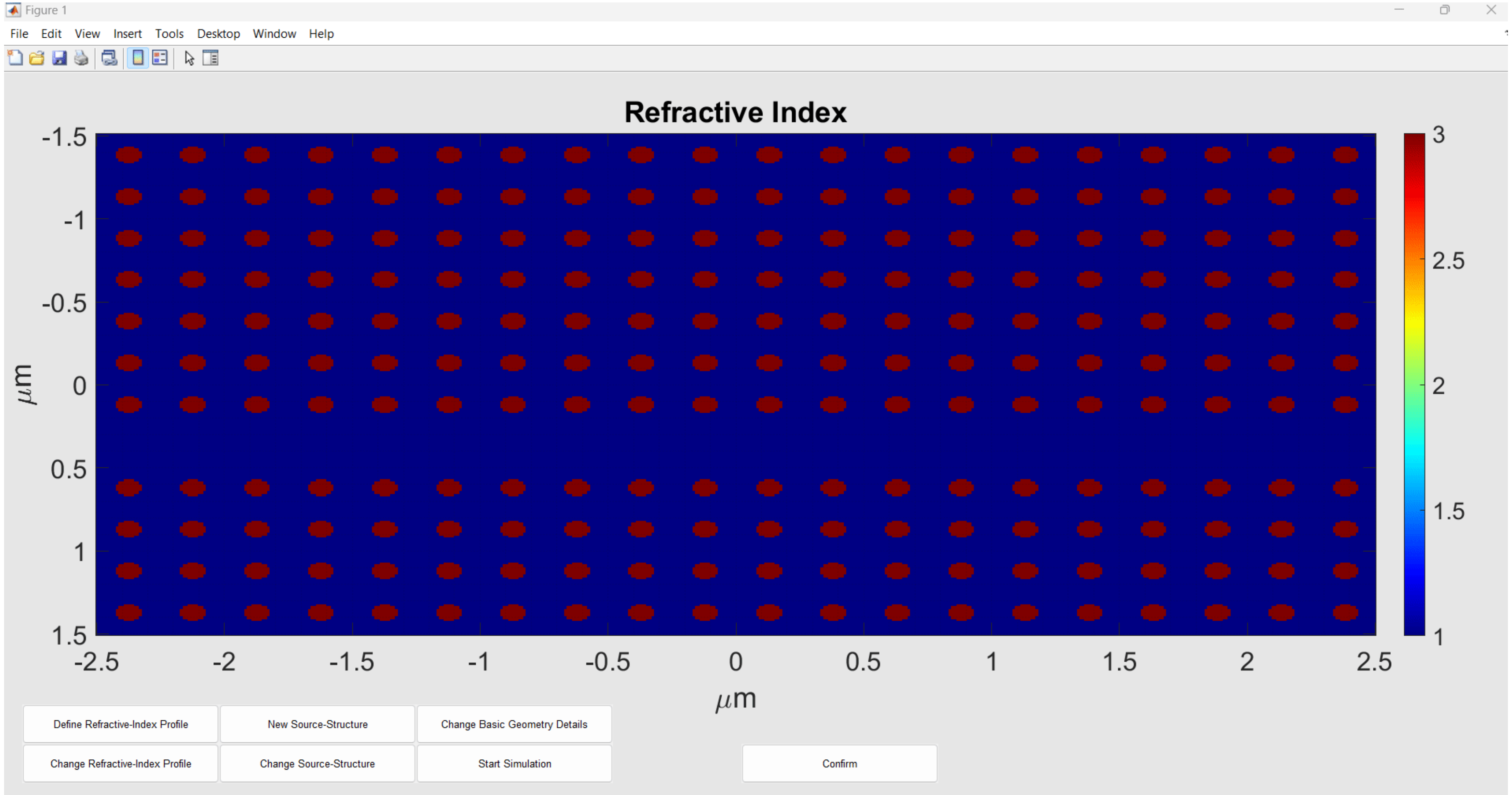
Light Propagation in a Photonic Crystal



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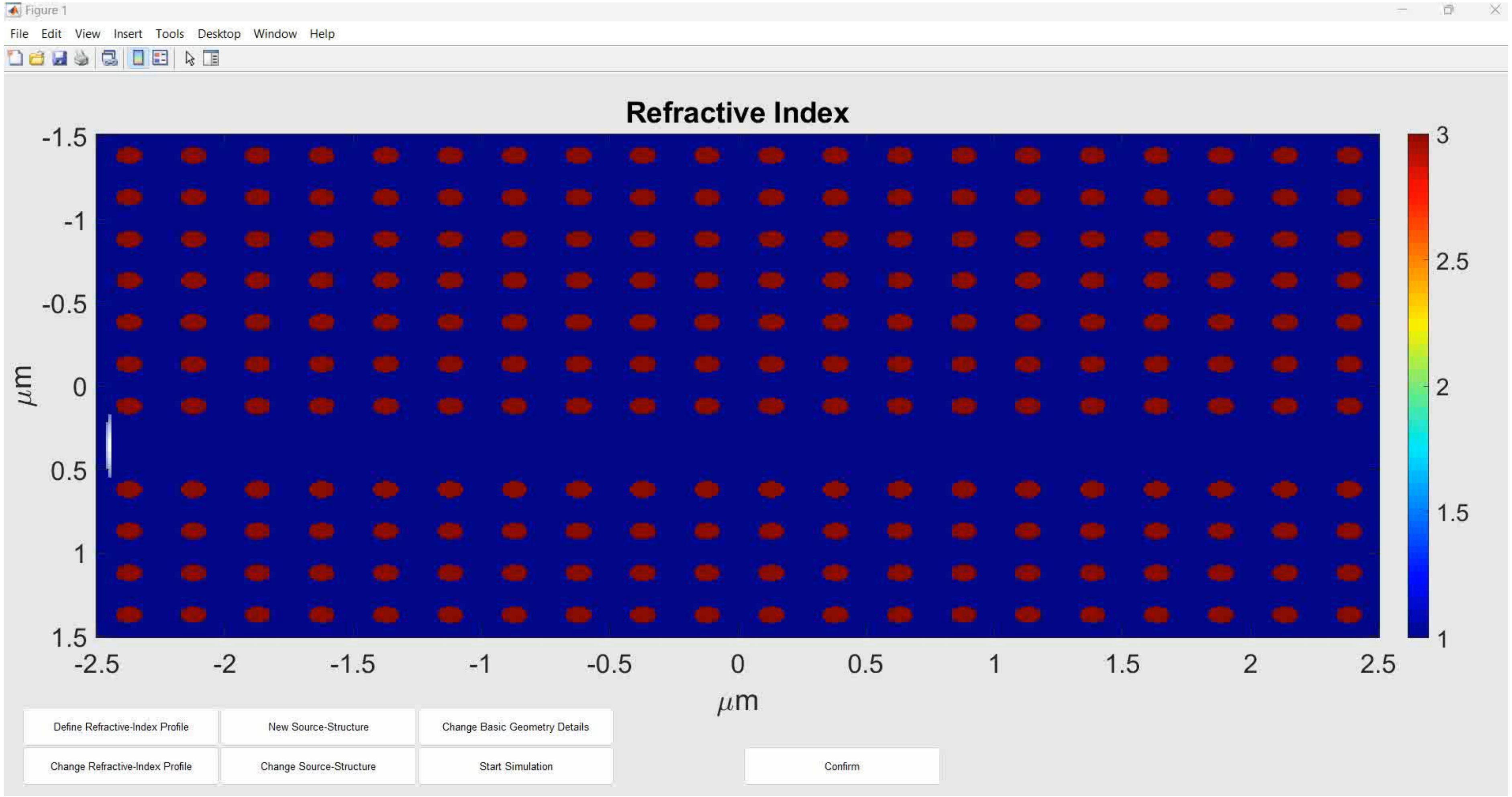
Light Propagation in a Photonic Crystal



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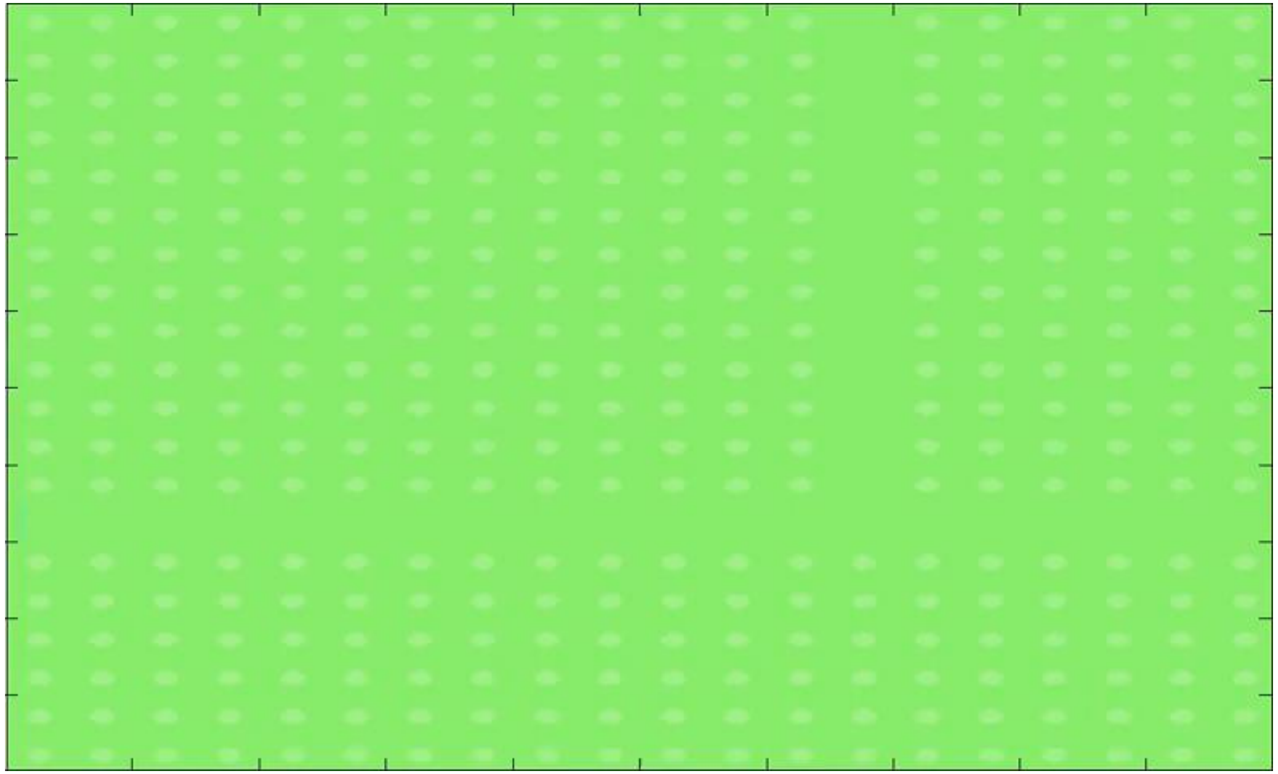
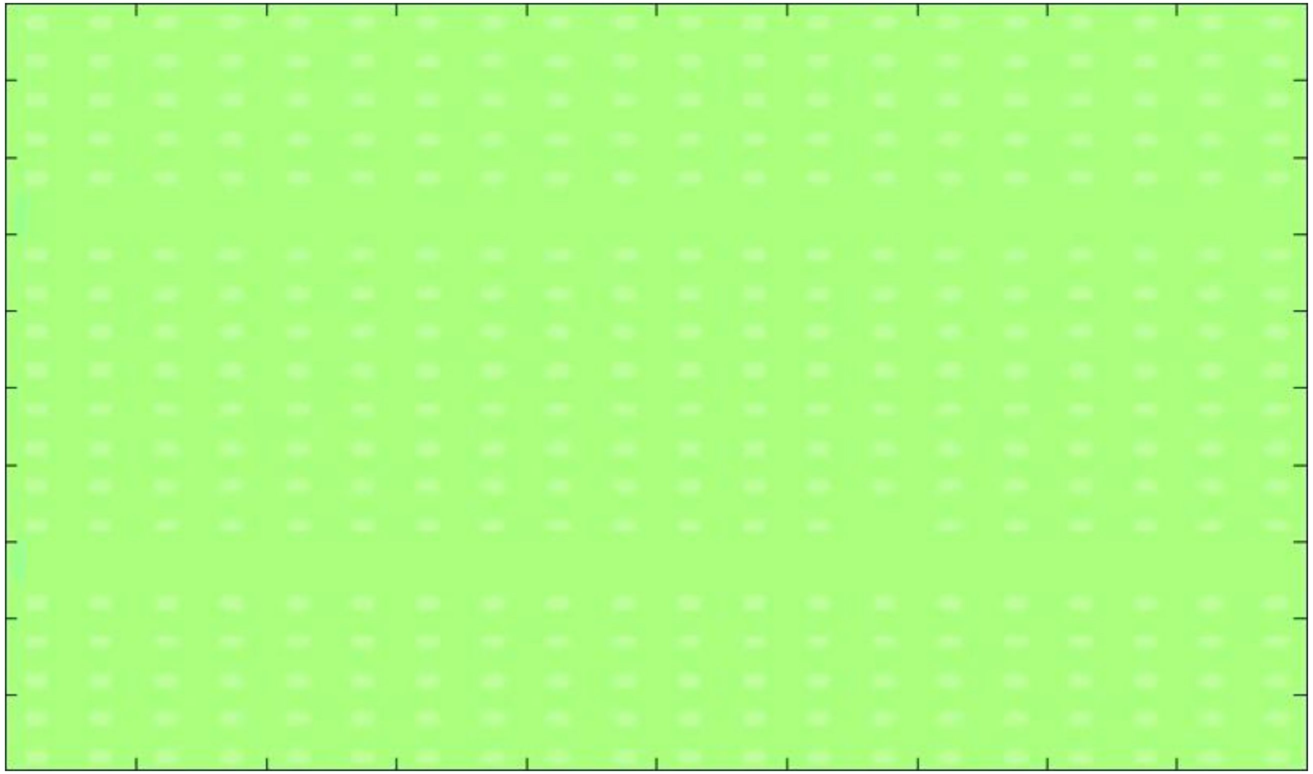
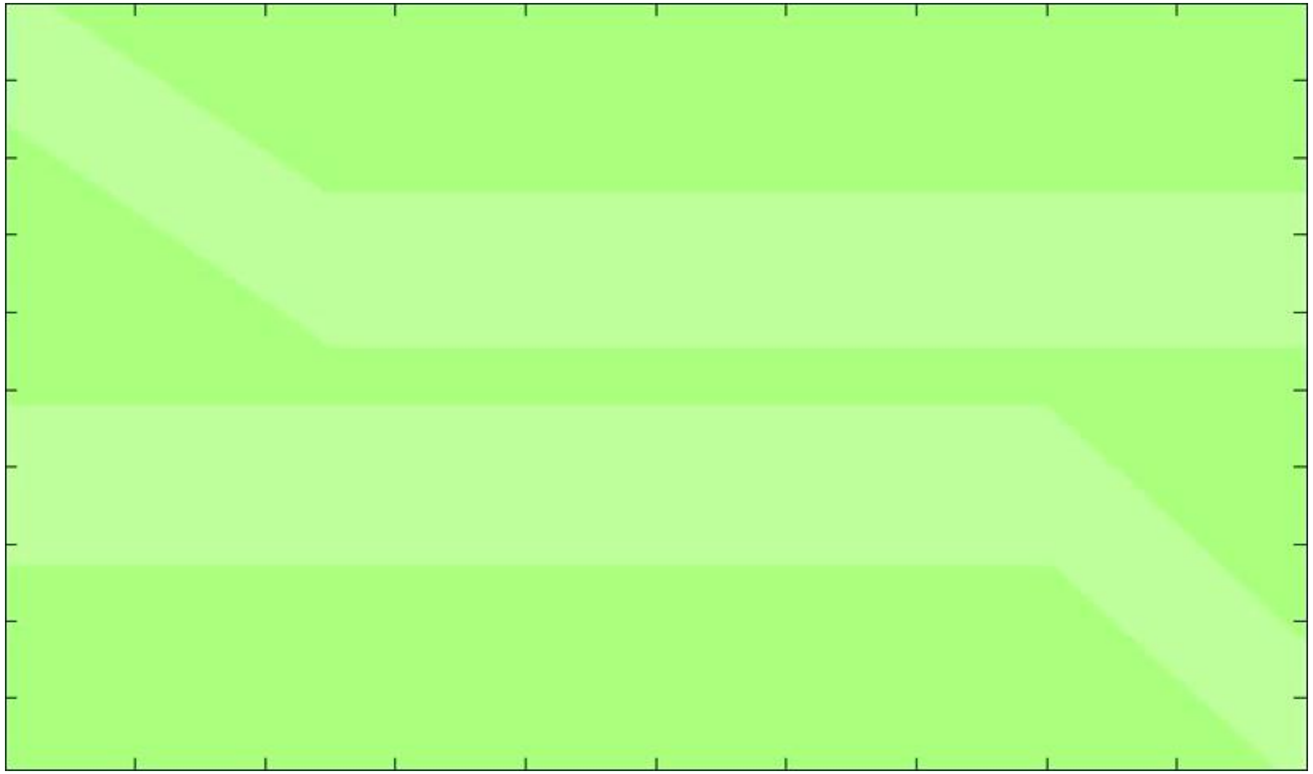
Photonic Crystal Waveguide Splitter



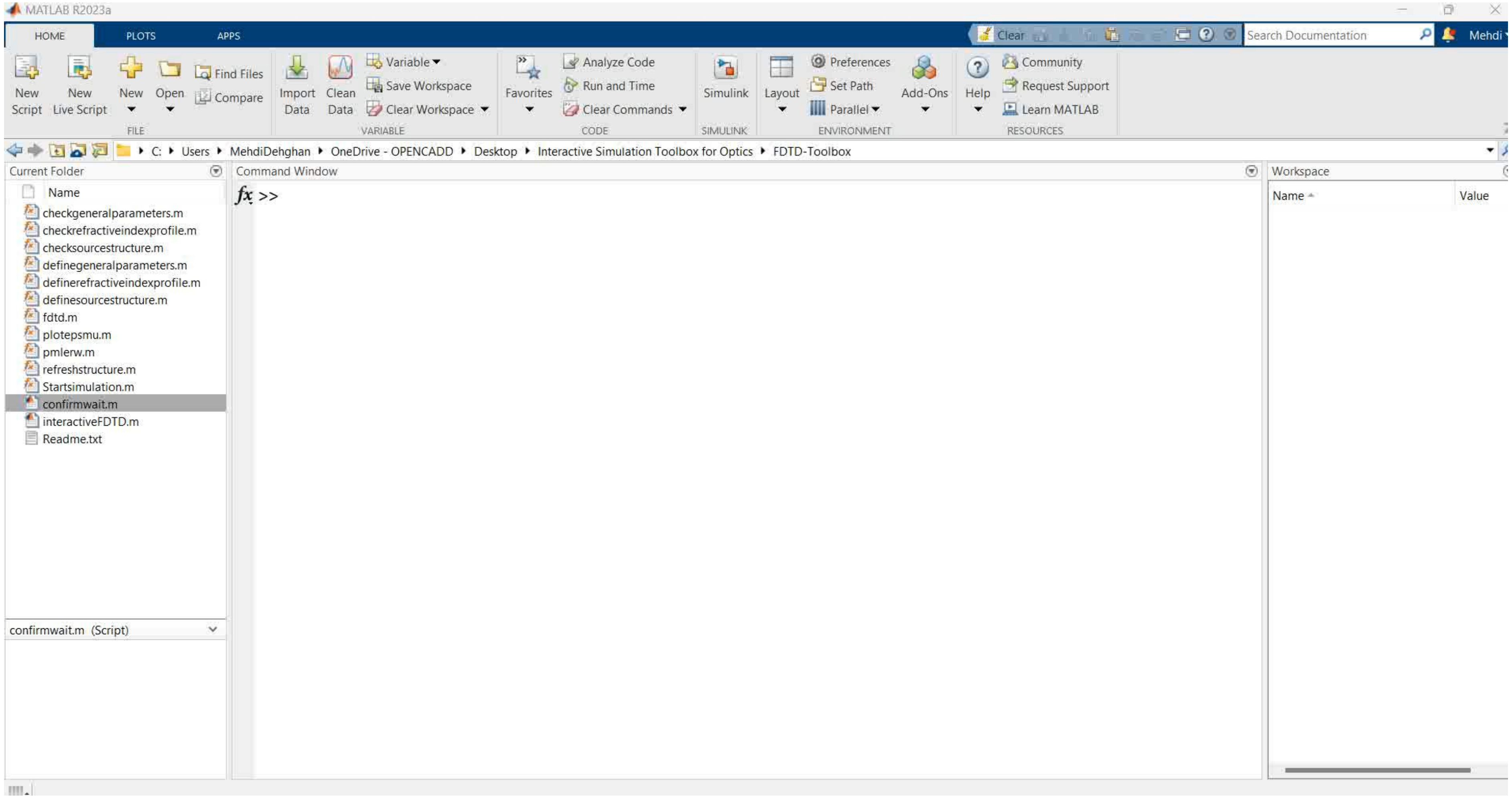
Photonic Crystal Waveguide - Defect Reflection



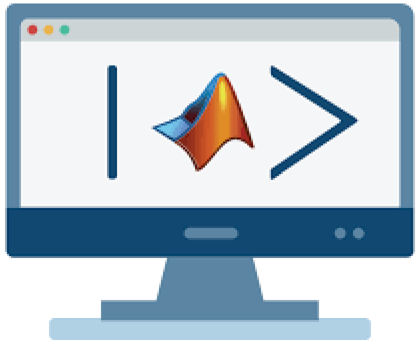
Photonic Crystal Waveguide Coupling

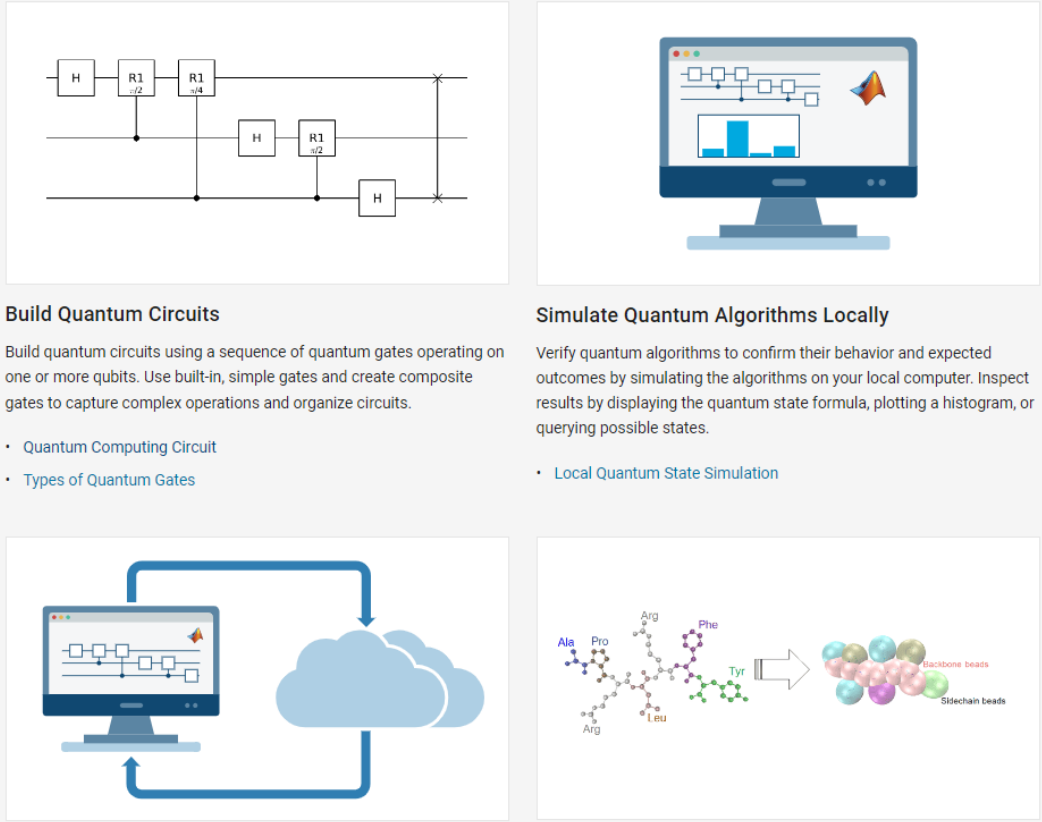


Finite Element with MATLAB



Quantum Computing with MATLAB





Build Quantum Circuits

Build quantum circuits using a sequence of quantum gates operating on one or more qubits. Use built-in, simple gates and create composite gates to capture complex operations and organize circuits.

- Quantum Computing Circuit
- Types of Quantum Gates

Simulate Quantum Algorithms Locally

Verify quantum algorithms to confirm their behavior and expected outcomes by simulating the algorithms on your local computer. Inspect results by displaying the quantum state formula, plotting a histogram, or querying possible states.

- Local Quantum State Simulation

Execute Algorithms on Quantum Computers

Connect to quantum computers through cloud services and run the quantum algorithms. Use quantum simulators supplied by quantum hardware providers to validate complex quantum circuits before running them on QPU devices.

Discover Quantum Computing Applications

Leverage quantum computers to solve problems in optimization, machine learning, and chemistry.

- Grover's Algorithm
- Ground-State Protein Folding Using Variational Quantum Eigensolver

https://www.mathworks.com/products/quantum-computing.html

https://www.mathworks.com/help/matlab/math/introduction-to-quantum-computing.html

https://www.mathworks.com/academia/books/introductory-quantum-mechanics-with-matlab-chelikowsky.html

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