Data Analysis, Visualization and Automation with MATLAB

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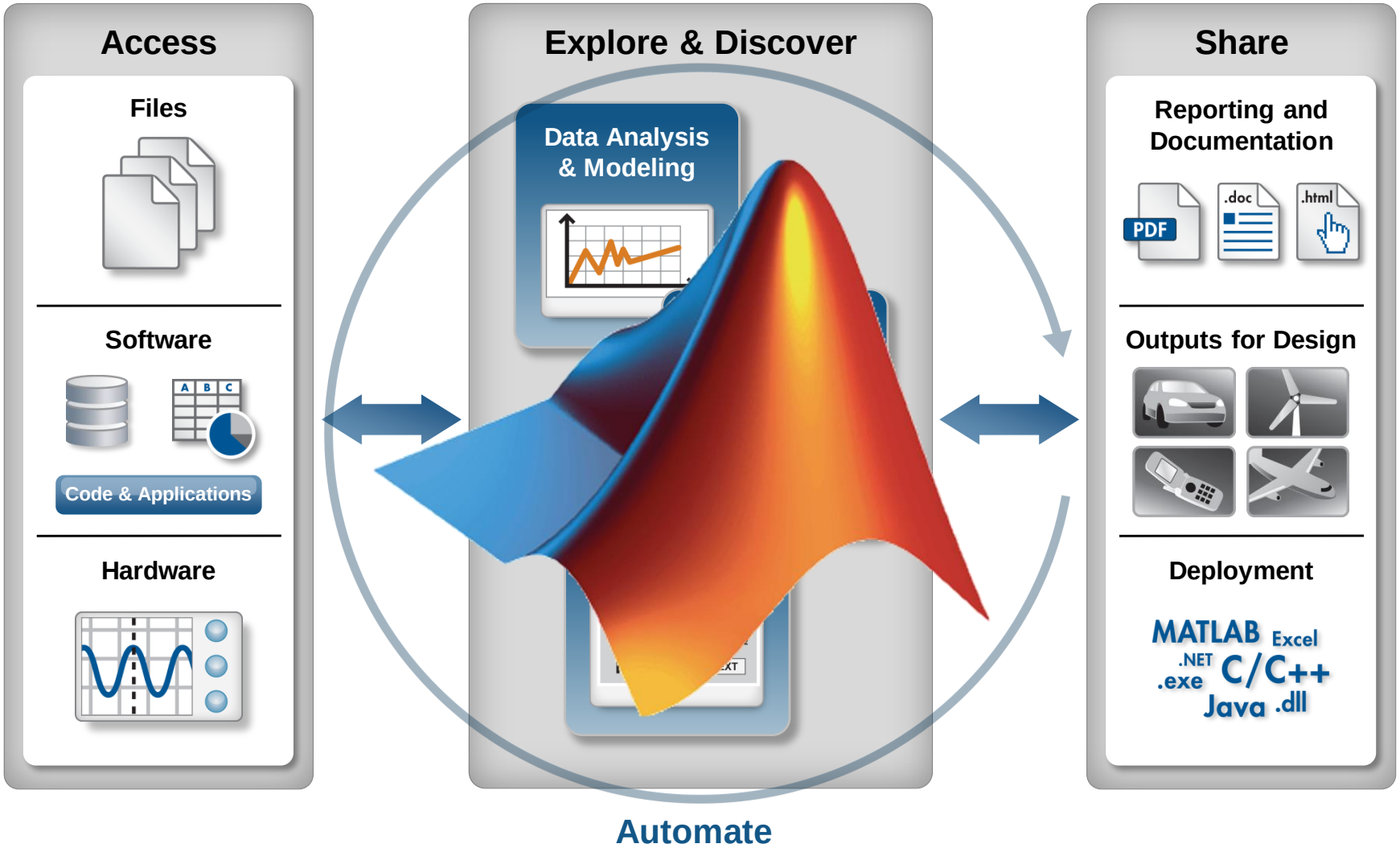
Agenda

- Data Analysis with MATLAB
- Demo: Solar Radiation Estimation
  - Introduction to MATLAB environment
  - Building analysis routines
  - Creating documentation
  - Deploying graphical applications
- Resources

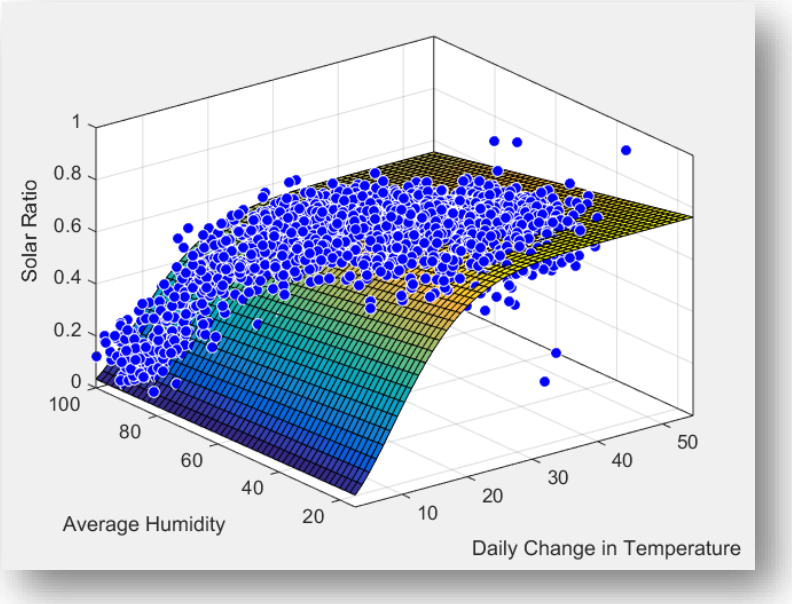
Technical Computing Workflow



Demo: Solar Radiation Estimation

Introduction to Data Analysis with MATLAB

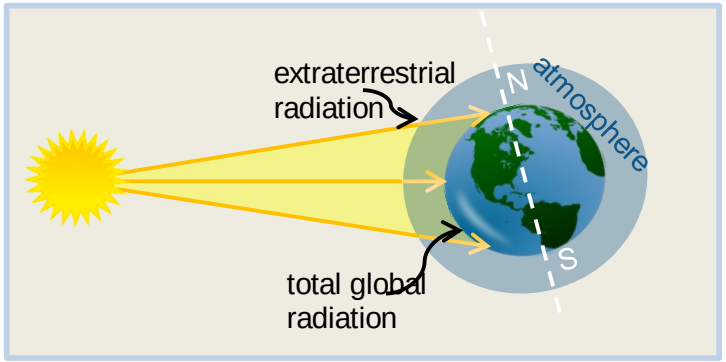
- Goal:
  - Estimate daily mean global solar radiation given low cost and easily obtained measurements
- Approach:
  - Process historical measurements
  - Develop predictive model
  - Document analysis in a report
  - Apply analysis on multiple files



Modeling Global Solar Radiation

$$R_s = a\,(1 + bH)(1 - e^{-c\,\Delta T^n})$$

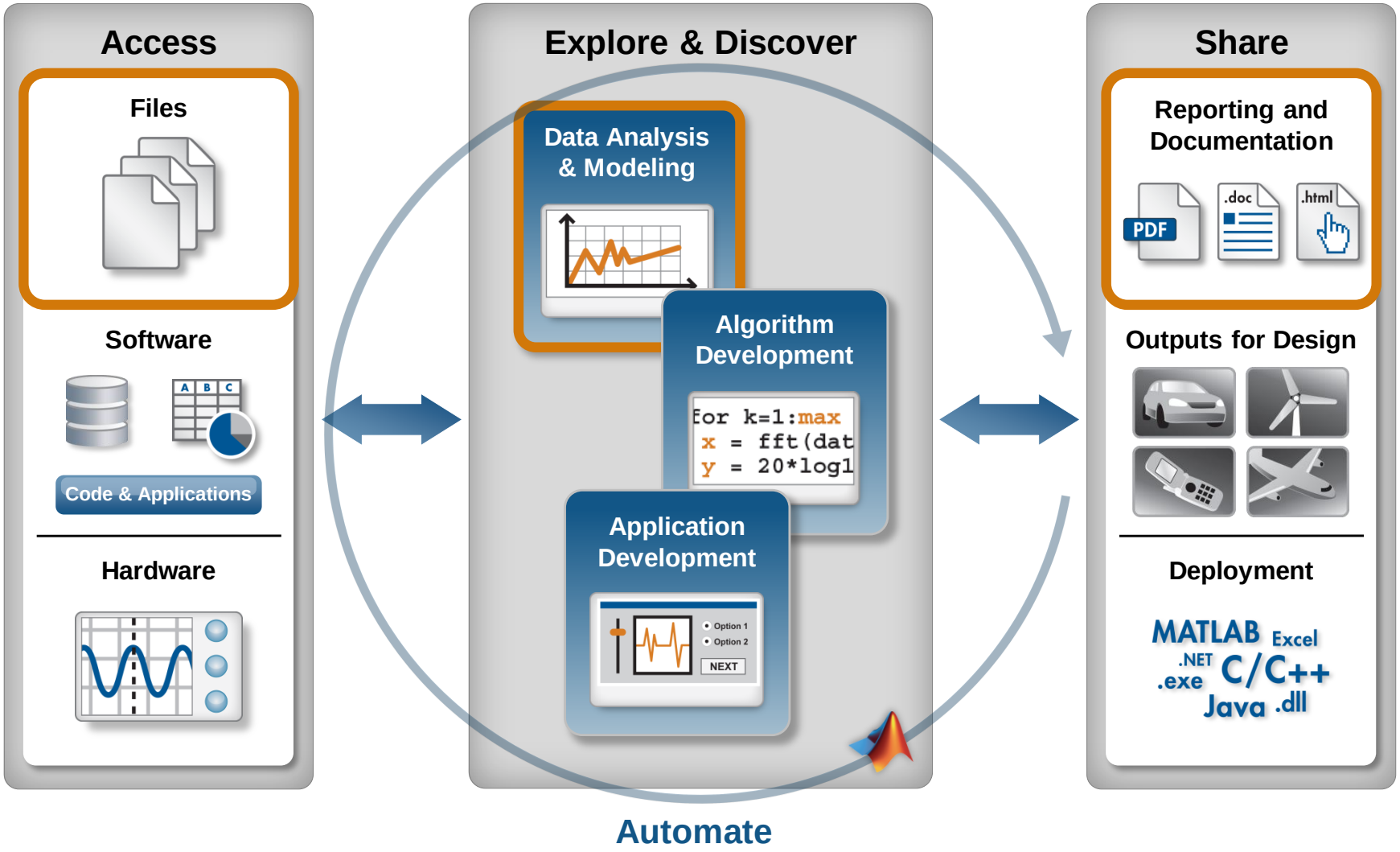
- Solar Ratio ($\boldsymbol{R_s}$) = $\dfrac{\text{Global solar radiation}}{\text{Extraterrestrial solar radiation}}$
- Daily Temperature Difference ($\Delta\mathbf{T}$) = $T_{DailyMax} - T_{DailyMin}$
- ***H*** is Relative Humidity
- ***a,b,c,n*** are the model coefficients



Demo Summary

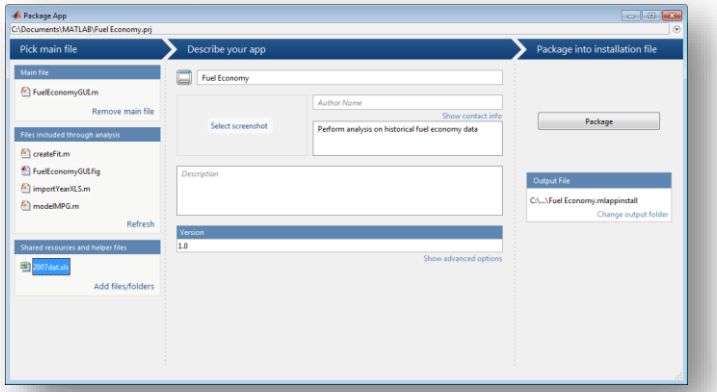
Solar Radiation Estimation

Products Used
- MATLAB
- Curve Fitting Toolbox

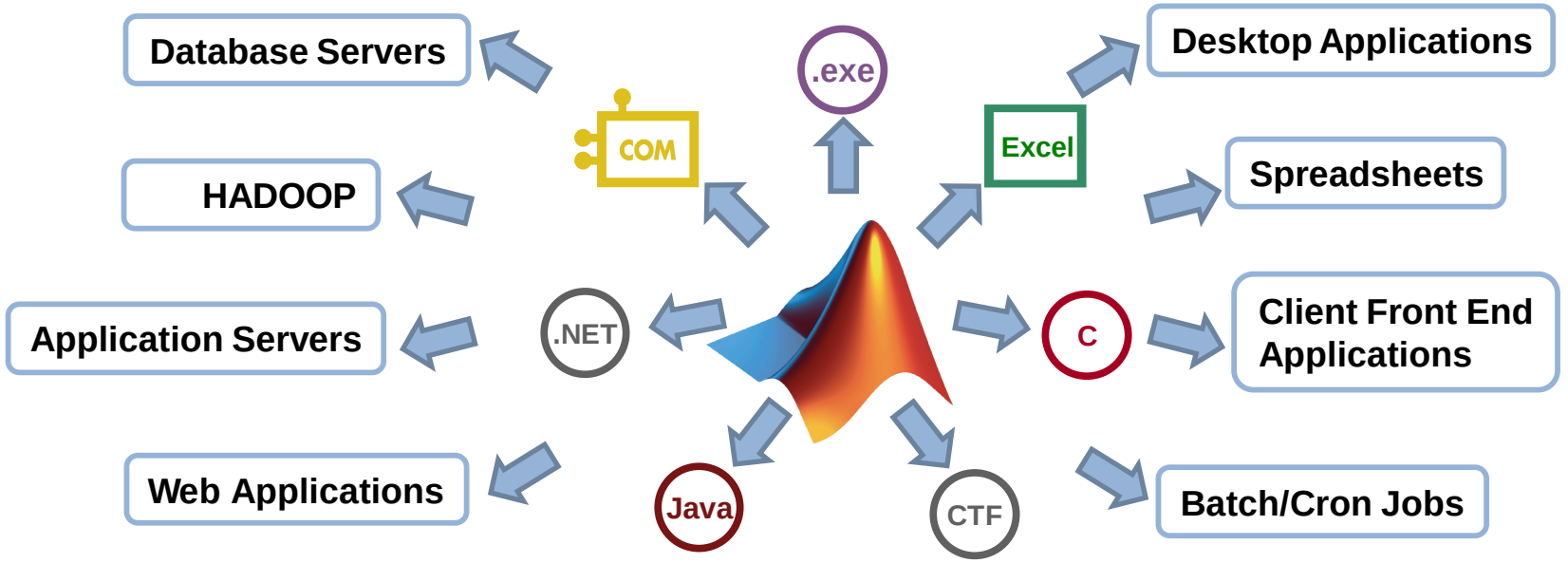


Packaging and Sharing MATLAB Apps

- MATLAB apps
  - Interactive applications to perform technical computing tasks
  - Displayed in apps gallery
- Included in many MATLAB products
- Package your own app
  - Create single file for distribution and installation into gallery
  - Packaging tool:
    - Automatically includes all necessary files
    - Documents required products

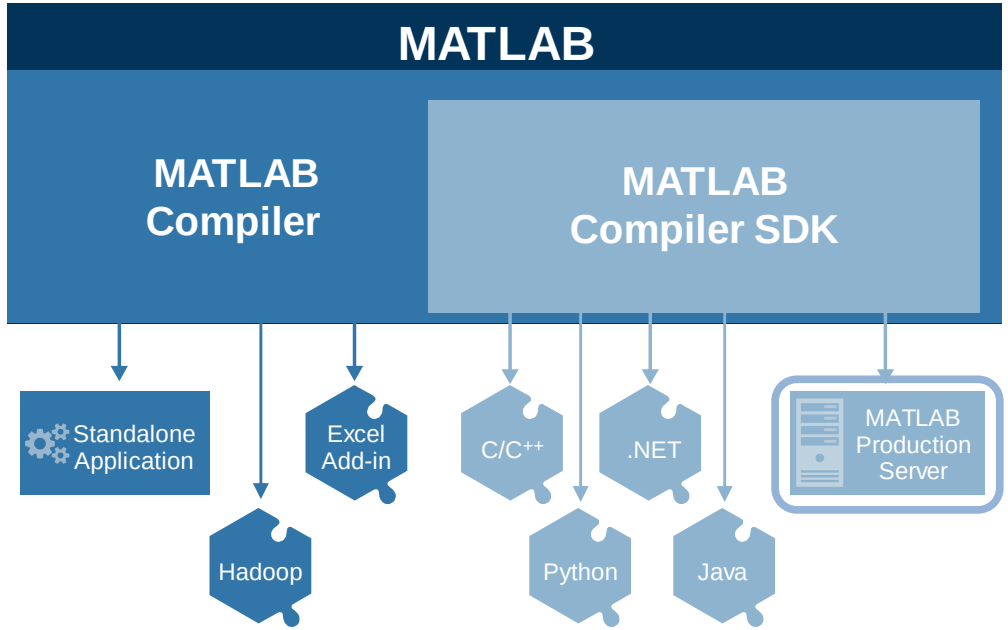


Deployment Highlights



- Royalty-free deployment
- Point-and-click workflow
- Unified process for desktop and server apps

Which Products Will Fit Your Needs?



MATLAB Compiler enables sharing MATLAB programs without integration programming

MATLAB Compiler SDK provides implementation and platform flexibility for software developers

MATLAB Production Server provides the most efficient development path for secure and scalable web and enterprise applications

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MATLAB Central

- Community for MATLAB and Simulink users
  - Over 70k daily visits
- File Exchange
  - Access more than 10k free files including functions, apps, examples, and models
- MATLAB Answers
  - Ask programming questions or search
  - 18k+ community-answered Questions
- Blogs
  - Read commentary from engineers who design, build, and support MATLAB and Simulink