Setting up the *QuantDiffForecast* Toolbox

Multiple parameter estimation options

- Estimation: NLSQ & MLE
- Error distributions: Normal, Poisson, and four variations of negative binomial
- Bootstrapping and number of initial guesses

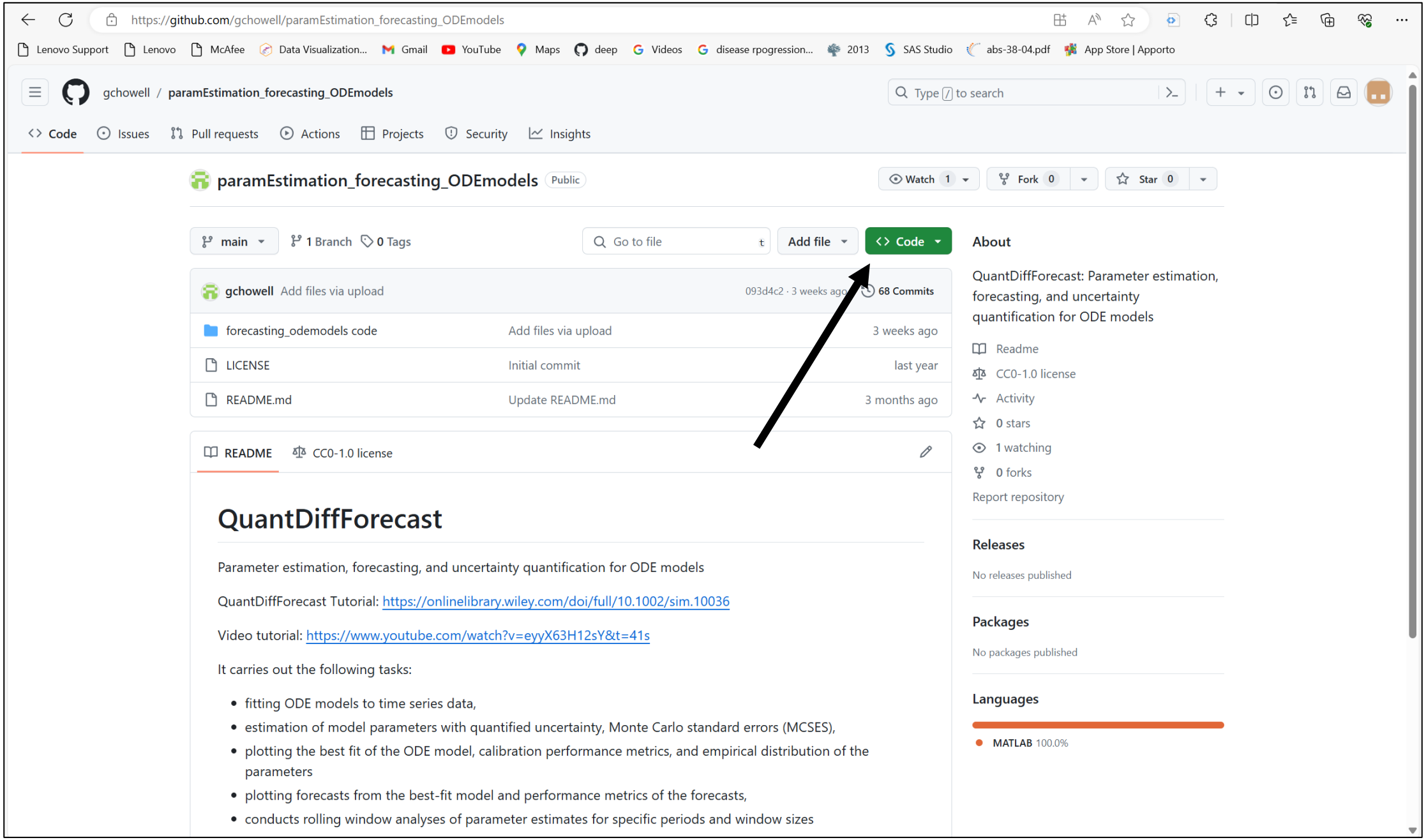
Flexible model specifications

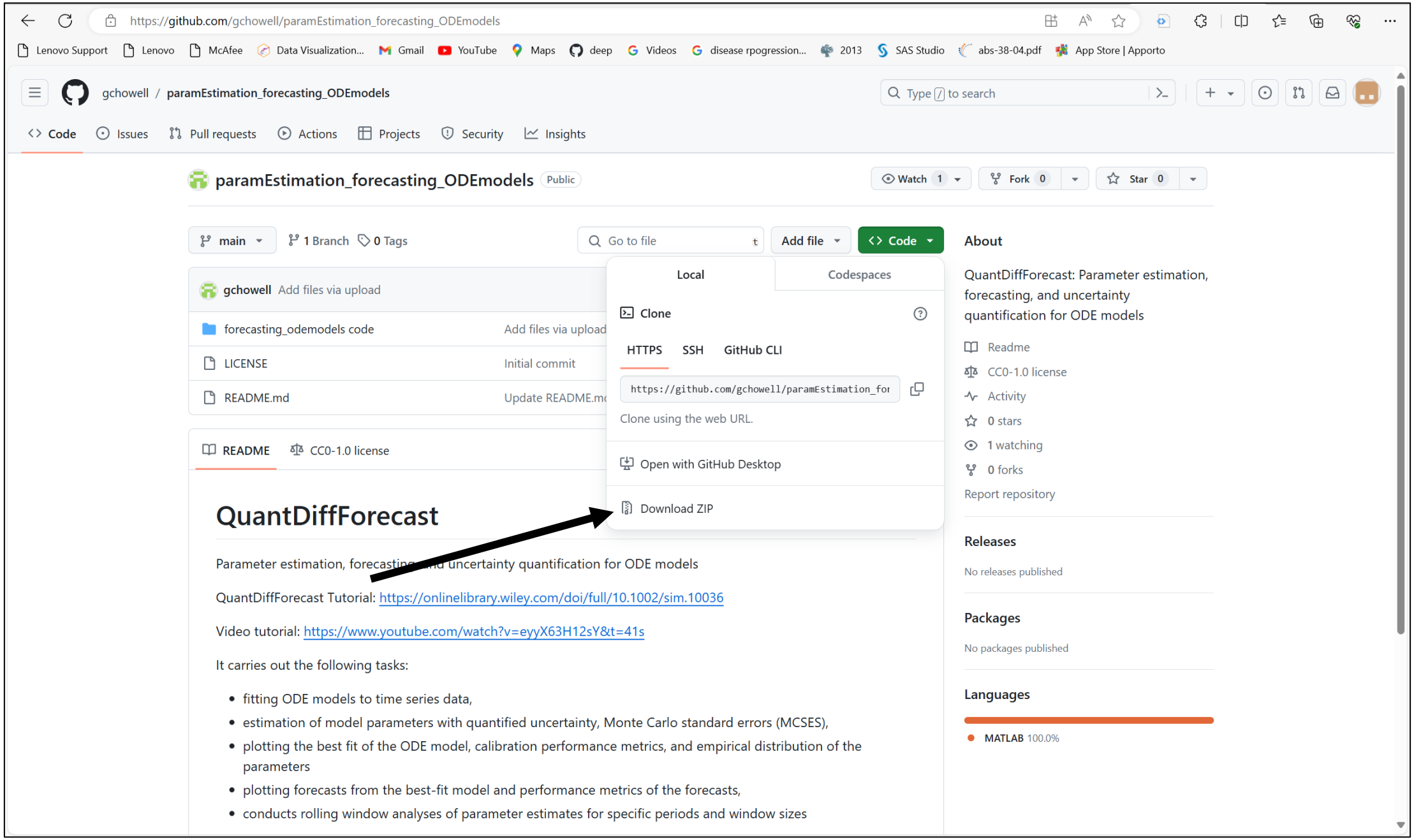
- User specified system of ODEs
- Initial parameter and state variable conditions
- Estimation of composite function(s) from the specified model parameters

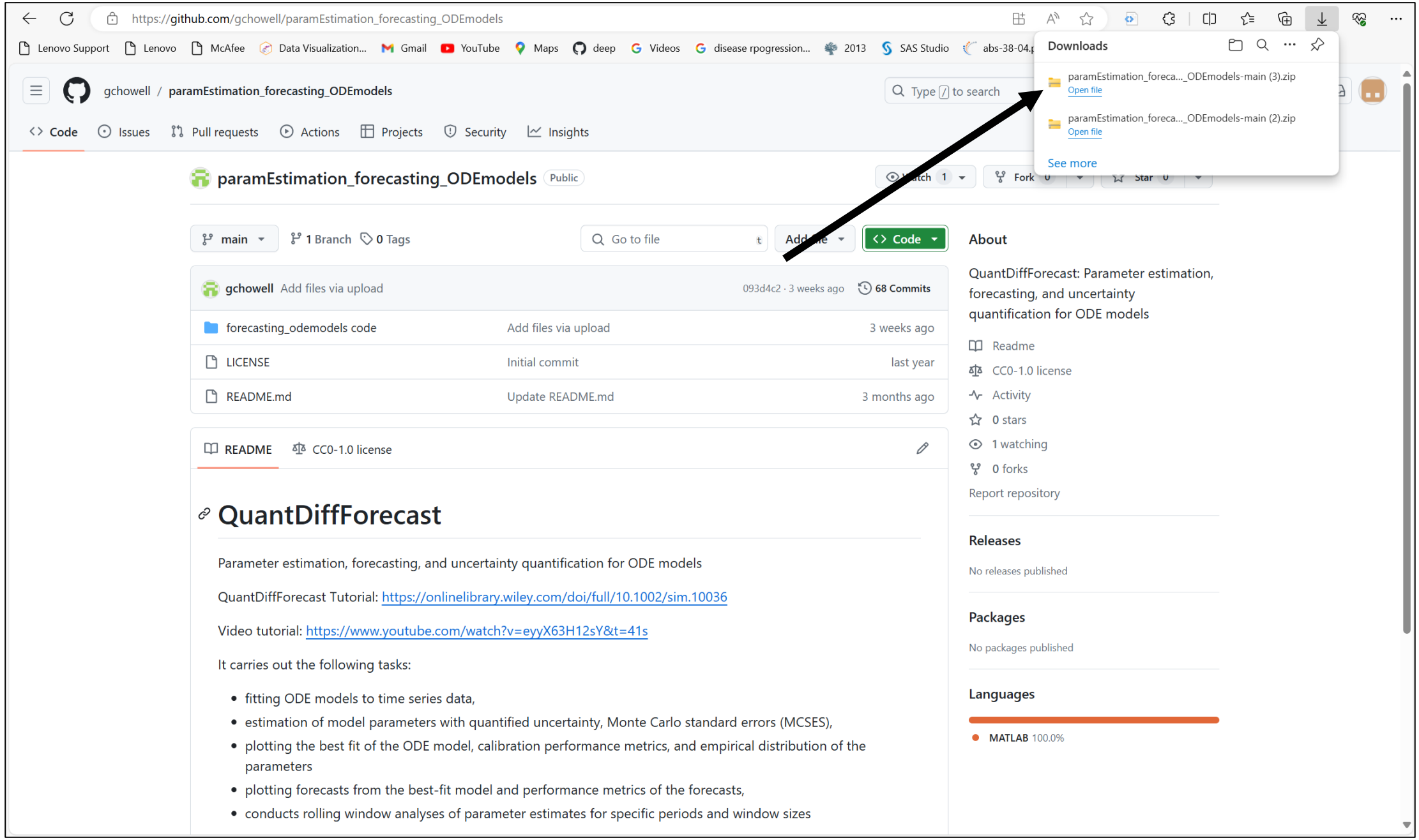
Evaluation of bootstrapping error, model fit and forecasting performance

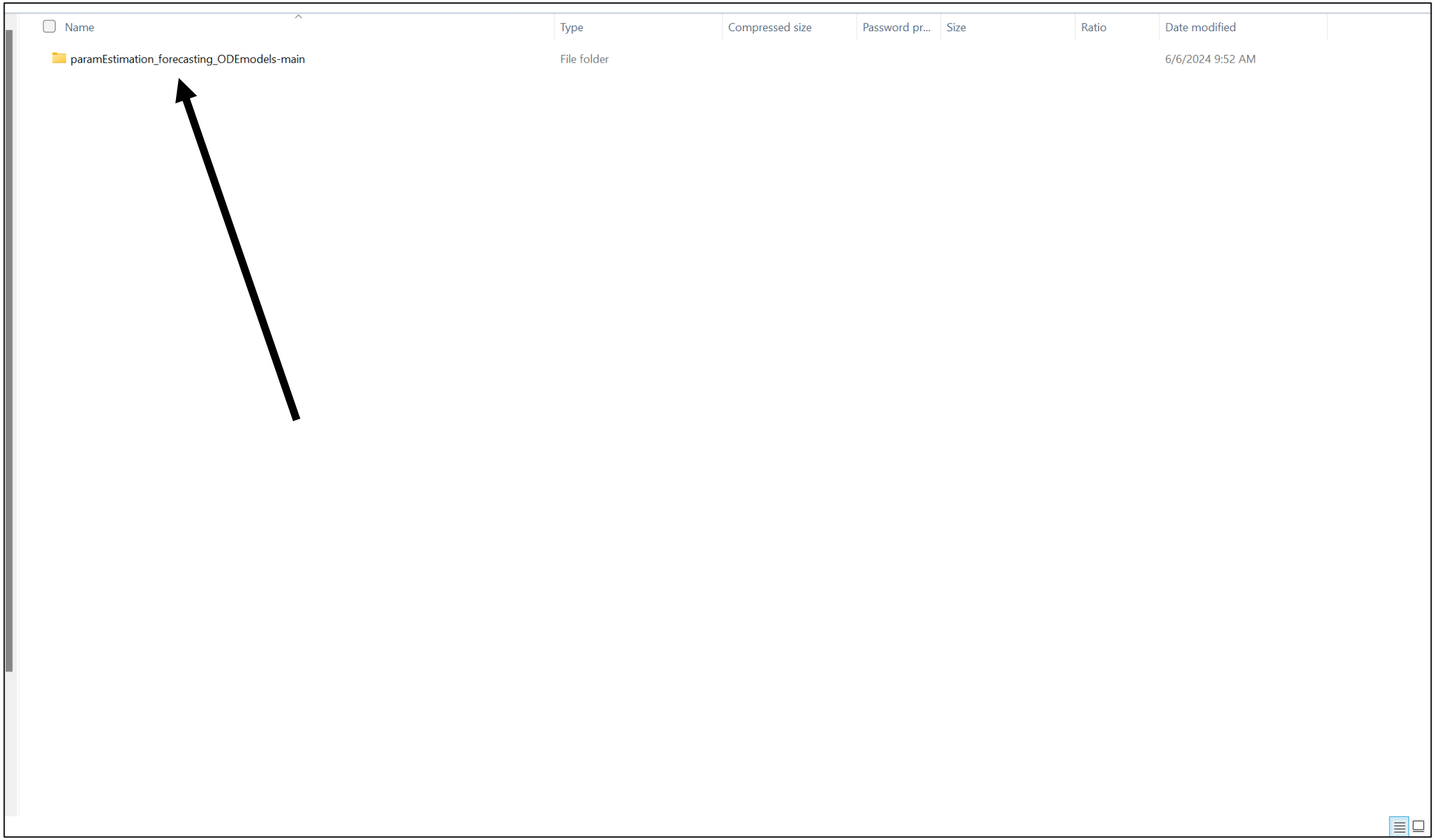
- Mean Squared Error (MSE)
- Mean Absolute Error (MAE)
- Weighted Interval Scores (WIS)
- 95% PI Coverage
- Monte Carlo Squared Error (MCSE)

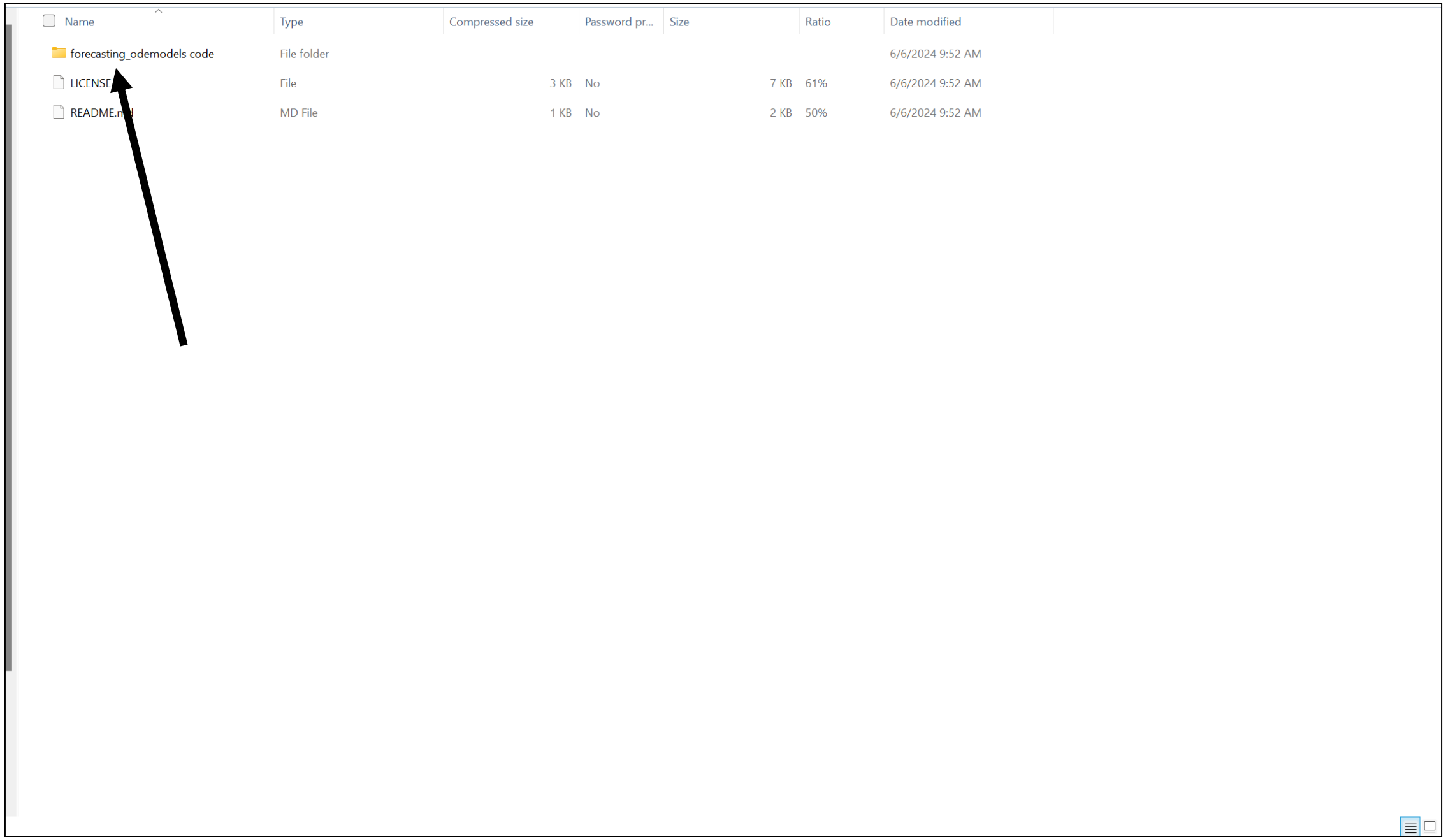
Downloading the Toolbox


https://github.com/gchowell/paramEstimation_forecasting_ODEmodels
Lenovo Support
Lenovo
McAfee
Data Visualization...
Gmail
YouTube
Maps
deep
Videos
disease rpogression...
2013
SAS Studio
abs-38-04.pdf
App Store | Apporto
gchowell / paramEstimation_forecasting_ODEmodels
Type / to search
Code
Issues
Pull requests
Actions
Projects
Security
Insights
paramEstimation_forecasting_ODEmodels
Public
Watch 1
Fork 0
Star 0
main
1 Branch
0 Tags
Go to file
t
Add file
Code
gchowell Add files via upload
093d4c2 · 3 weeks ago
68 Commits
forecasting_odemodels code
Add files via upload
3 weeks ago
LICENSE
Initial commit
last year
README.md
Update README.md
3 months ago
README
CC0-1.0 license
QuantDiffForecast
Parameter estimation, forecasting, and uncertainty quantification for ODE models
QuantDiffForecast Tutorial: https://onlinelibrary.wiley.com/doi/full/10.1002/sim.10036
Video tutorial: https://www.youtube.com/watch?v=eyyX63H12sY&t=41s
It carries out the following tasks:
fitting ODE models to time series data,
estimation of model parameters with quantified uncertainty, Monte Carlo standard errors (MCSES),
plotting the best fit of the ODE model, calibration performance metrics, and empirical distribution of the parameters
plotting forecasts from the best-fit model and performance metrics of the forecasts,
conducts rolling window analyses of parameter estimates for specific periods and window sizes
About
QuantDiffForecast: Parameter estimation, forecasting, and uncertainty quantification for ODE models
Readme
CC0-1.0 license
Activity
0 stars
1 watching
0 forks
Report repository
Releases
No releases published
Packages
No packages published
Languages
MATLAB 100.0%


https://github.com/gchowell/paramEstimation_forecasting_ODEmodels
Lenovo Support
Lenovo
McAfee
Data Visualization...
Gmail
YouTube
Maps
deep
Videos
disease rpogression...
2013
SAS Studio
abs-38-04.pdf
App Store | Apporto
gchowell / paramEstimation_forecasting_ODEmodels
Type / to search
Code
Issues
Pull requests
Actions
Projects
Security
Insights
paramEstimation_forecasting_ODEmodels
Public
Watch 1
Fork 0
Star 0
main
1 Branch
0 Tags
Go to file
t
Add file
Code
gchowell Add files via upload
forecasting_odemodels code
Add files via upload
LICENSE
Initial commit
README.md
Update README.md
Local
Codespaces
Clone
HTTPS
SSH
GitHub CLI
https://github.com/gchowell/paramEstimation_for
Clone using the web URL.
Open with GitHub Desktop
Download ZIP
README
CC0-1.0 license
QuantDiffForecast
Parameter estimation, forecasting, and uncertainty quantification for ODE models
QuantDiffForecast Tutorial: https://onlinelibrary.wiley.com/doi/full/10.1002/sim.10036
Video tutorial: https://www.youtube.com/watch?v=eyyX63H12sY&t=41s
It carries out the following tasks:
fitting ODE models to time series data,
estimation of model parameters with quantified uncertainty, Monte Carlo standard errors (MCSES),
plotting the best fit of the ODE model, calibration performance metrics, and empirical distribution of the parameters
plotting forecasts from the best-fit model and performance metrics of the forecasts,
conducts rolling window analyses of parameter estimates for specific periods and window sizes
About
QuantDiffForecast: Parameter estimation, forecasting, and uncertainty quantification for ODE models
Readme
CC0-1.0 license
Activity
0 stars
1 watching
0 forks
Report repository
Releases
No releases published
Packages
No packages published
Languages
MATLAB 100.0%

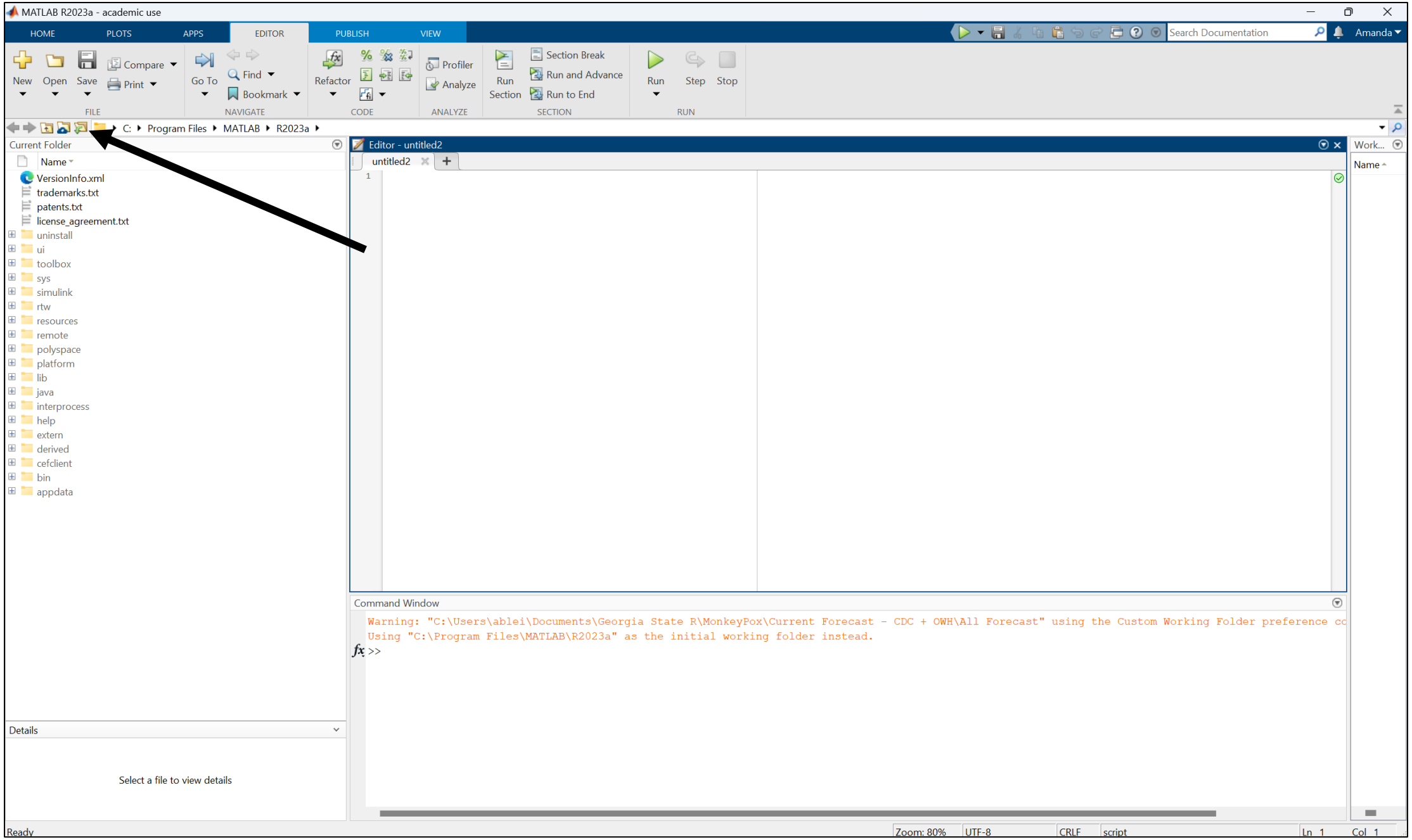

https://github.com/gchowell/paramEstimation_forecasting_ODEmodels
Lenovo Support
Lenovo
McAfee
Data Visualization...
Gmail
YouTube
Maps
deep
Videos
disease rpogression...
2013
SAS Studio
abs-38-04.p
Downloads
paramEstimation_foreca..._ODEmodels-main (3).zip
Open file
paramEstimation_foreca..._ODEmodels-main (2).zip
Open file
See more
gchowell / paramEstimation_forecasting_ODEmodels
Type / to search
Code
Issues
Pull requests
Actions
Projects
Security
Insights
paramEstimation_forecasting_ODEmodels
Public
Watch 1
Fork 0
Star 0
main
1 Branch
0 Tags
Go to file
t
Add file
Code
gchowell Add files via upload
093d4c2 · 3 weeks ago
68 Commits
forecasting_odemodels code
Add files via upload
3 weeks ago
LICENSE
Initial commit
last year
README.md
Update README.md
3 months ago
README
CC0-1.0 license
QuantDiffForecast
Parameter estimation, forecasting, and uncertainty quantification for ODE models
QuantDiffForecast Tutorial: https://onlinelibrary.wiley.com/doi/full/10.1002/sim.10036
Video tutorial: https://www.youtube.com/watch?v=eyyX63H12sY&t=41s
It carries out the following tasks:
fitting ODE models to time series data,
estimation of model parameters with quantified uncertainty, Monte Carlo standard errors (MCSES),
plotting the best fit of the ODE model, calibration performance metrics, and empirical distribution of the parameters
plotting forecasts from the best-fit model and performance metrics of the forecasts,
conducts rolling window analyses of parameter estimates for specific periods and window sizes
About
QuantDiffForecast: Parameter estimation, forecasting, and uncertainty quantification for ODE models
Readme
CC0-1.0 license
Activity
0 stars
1 watching
0 forks
Report repository
Releases
No releases published
Packages
No packages published
Languages
MATLAB 100.0%

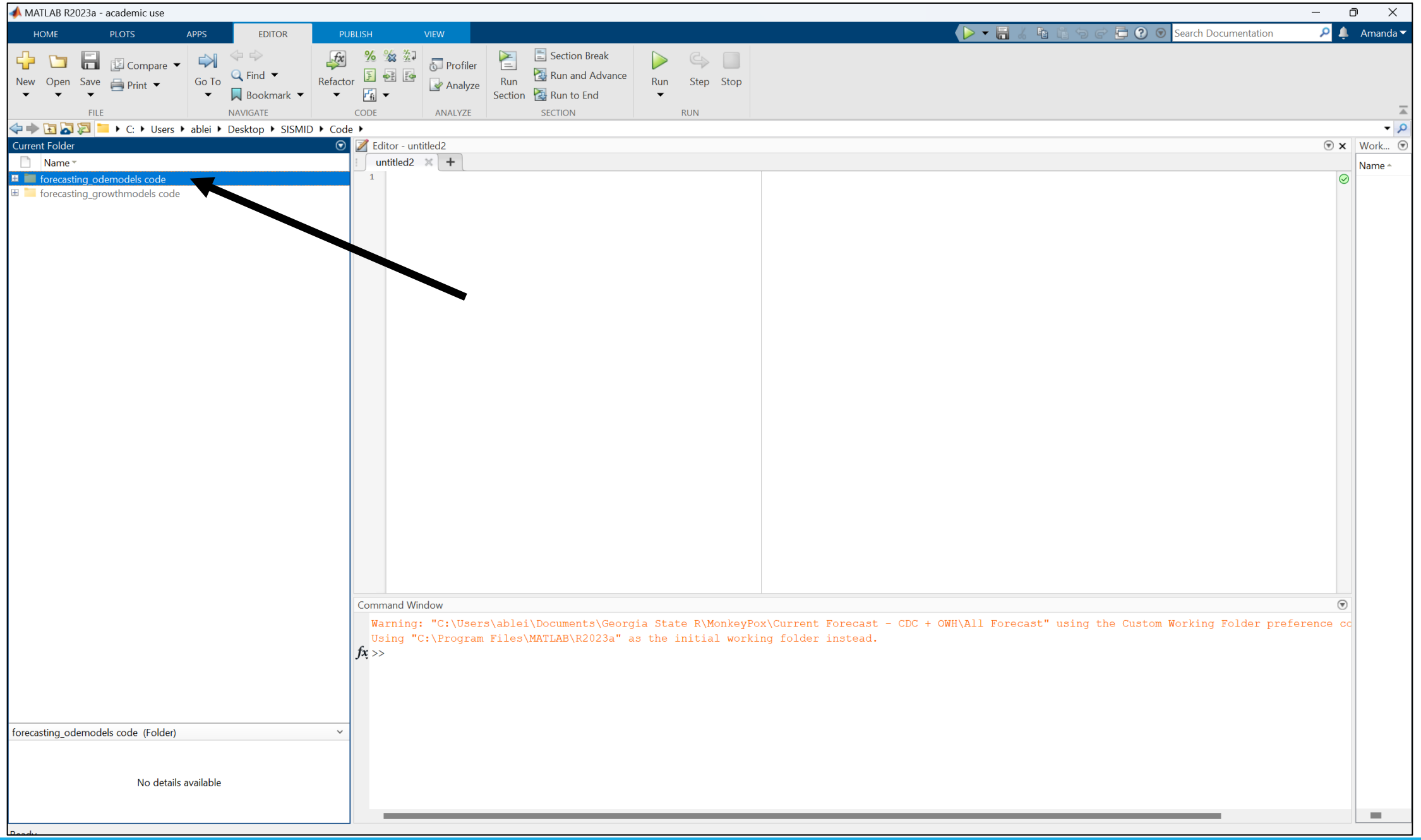

Name
Type
Compressed size
Password pr...
Size
Ratio
Date modified
paramEstimation_forecasting_ODEmodels-main
File folder
6/6/2024 9:52 AM

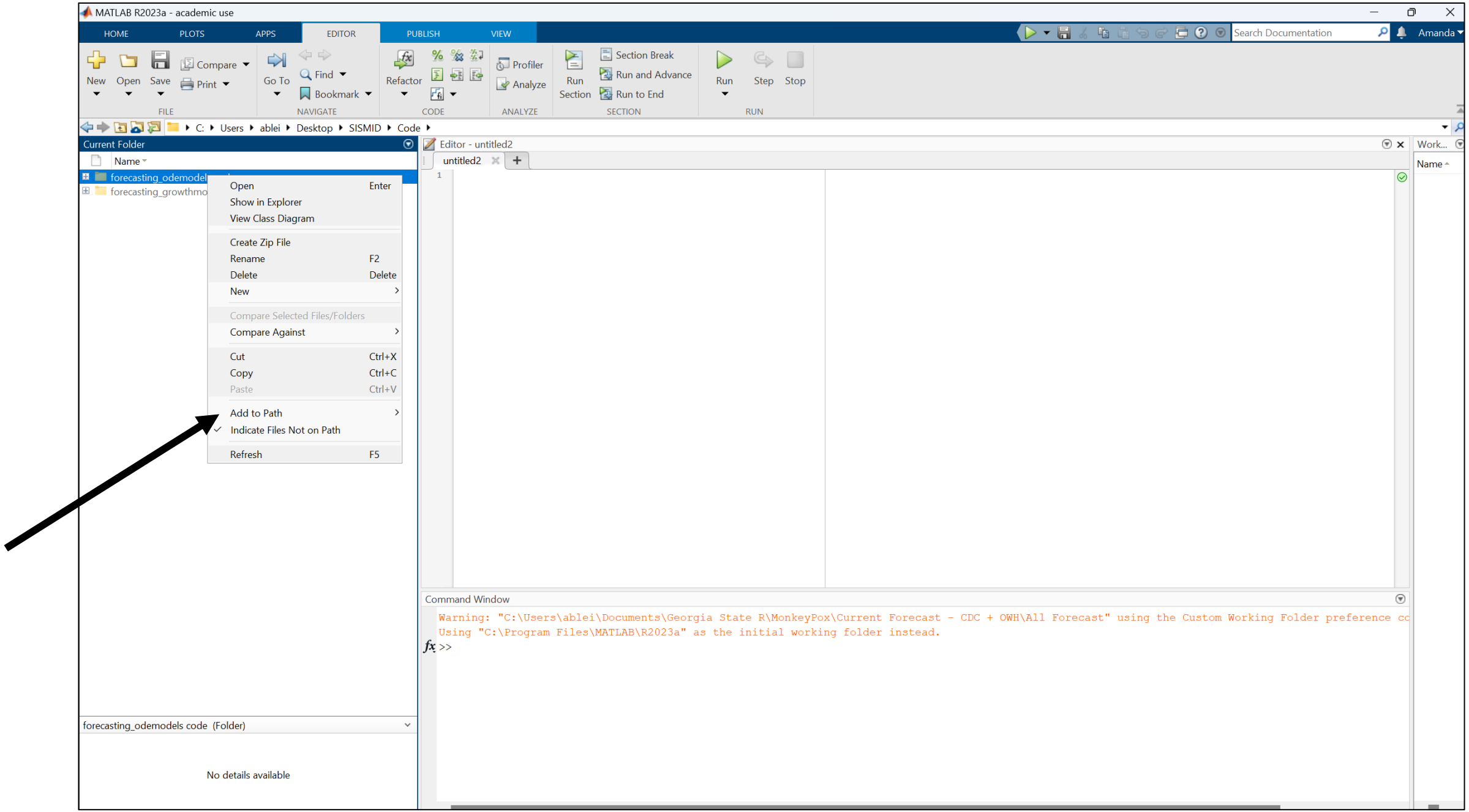

Name
Type
Compressed size
Password pr...
Size
Ratio
Date modified
forecasting_odemodels code
File folder
6/6/2024 9:52 AM
LICENSE
File
3 KB
No
7 KB
61%
6/6/2024 9:52 AM
README.md
MD File
1 KB
No
2 KB
50%
6/6/2024 9:52 AM

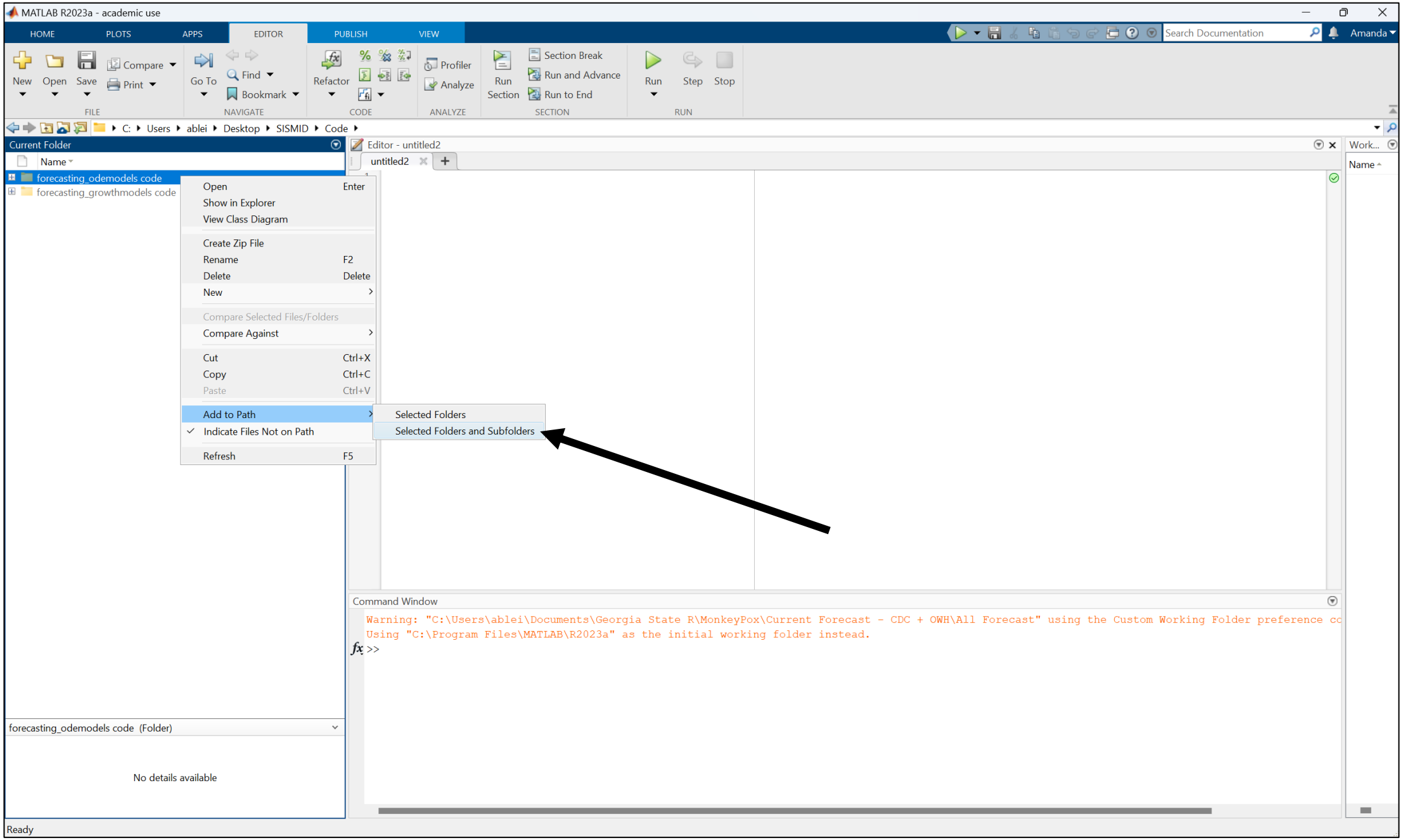
Name	Type	Compressed size	Password pr...	Size	Ratio	Date modified
input	File folder					6/6/2024 9:52 AM
AddErrorStructure	MATLAB Code	1 KB	No	4 KB	78%	6/6/2024 9:52 AM
composite1	MATLAB Code	1 KB	No	1 KB	38%	6/6/2024 9:52 AM
computeforecastperformance	MATLAB Code	1 KB	No	4 KB	68%	6/6/2024 9:52 AM
computeQuantiles	MATLAB Code	1 KB	No	2 KB	60%	6/6/2024 9:52 AM
computeWIS	MATLAB Code	2 KB	No	4 KB	71%	6/6/2024 9:52 AM
EXP	MATLAB Code	1 KB	No	1 KB	65%	6/6/2024 9:52 AM
fit_model	MATLAB Code	3 KB	No	8 KB	64%	6/6/2024 9:52 AM
get_nparams	MATLAB Code	1 KB	No	1 KB	58%	6/6/2024 9:52 AM
GetAdjustedFontSize	MATLAB Code	1 KB	No	1 KB	47%	6/6/2024 9:52 AM
getAICc	MATLAB Code	1 KB	No	2 KB	68%	6/6/2024 9:52 AM
getMeanVarianceRatio	MATLAB Code	1 KB	No	1 KB	74%	6/6/2024 9:52 AM
GGM	MATLAB Code	1 KB	No	1 KB	64%	6/6/2024 9:52 AM
GLM	MATLAB Code	1 KB	No	1 KB	66%	6/6/2024 9:52 AM
initialParams	MATLAB Code	1 KB	No	1 KB	71%	6/6/2024 9:52 AM
options_fit	MATLAB Code	2 KB	No	6 KB	71%	6/6/2024 9:52 AM
options_fit_SEIR_flu1918	MATLAB Code	2 KB	No	6 KB	70%	6/6/2024 9:52 AM
options_fit_SEIR_flu1918_dist1_0	MATLAB Code	2 KB	No	6 KB	70%	6/6/2024 9:52 AM
options_fit_SEIR_flu1918_dist1_1	MATLAB Code	2 KB	No	5 KB	70%	6/6/2024 9:52 AM
options_fit_SEIR_flu1918_dist1_3	MATLAB Code	2 KB	No	5 KB	70%	6/6/2024 9:52 AM
options_fit_SEIR_unreported_covid_sp...	MATLAB Code	2 KB	No	6 KB	69%	6/6/2024 9:52 AM
options_fit_SEIR_unreported_covid_sp...	MATLAB Code	2 KB	No	6 KB	69%	6/6/2024 9:52 AM
options_fit_SEIR1	MATLAB Code	2 KB	No	6 KB	70%	6/6/2024 9:52 AM
options_forecast_EXP_flu1918_dist1_3	MATLAB Code	2 KB	No	6 KB	71%	6/6/2024 9:52 AM
options_forecast_SEIR_flu1918_dist1_0	MATLAB Code	2 KB	No	6 KB	71%	6/6/2024 9:52 AM
options_forecast_SEIR_flu1918_dist1_3	MATLAB Code	2 KB	No	6 KB	70%	6/6/2024 9:52 AM

Setting up the Working Directory

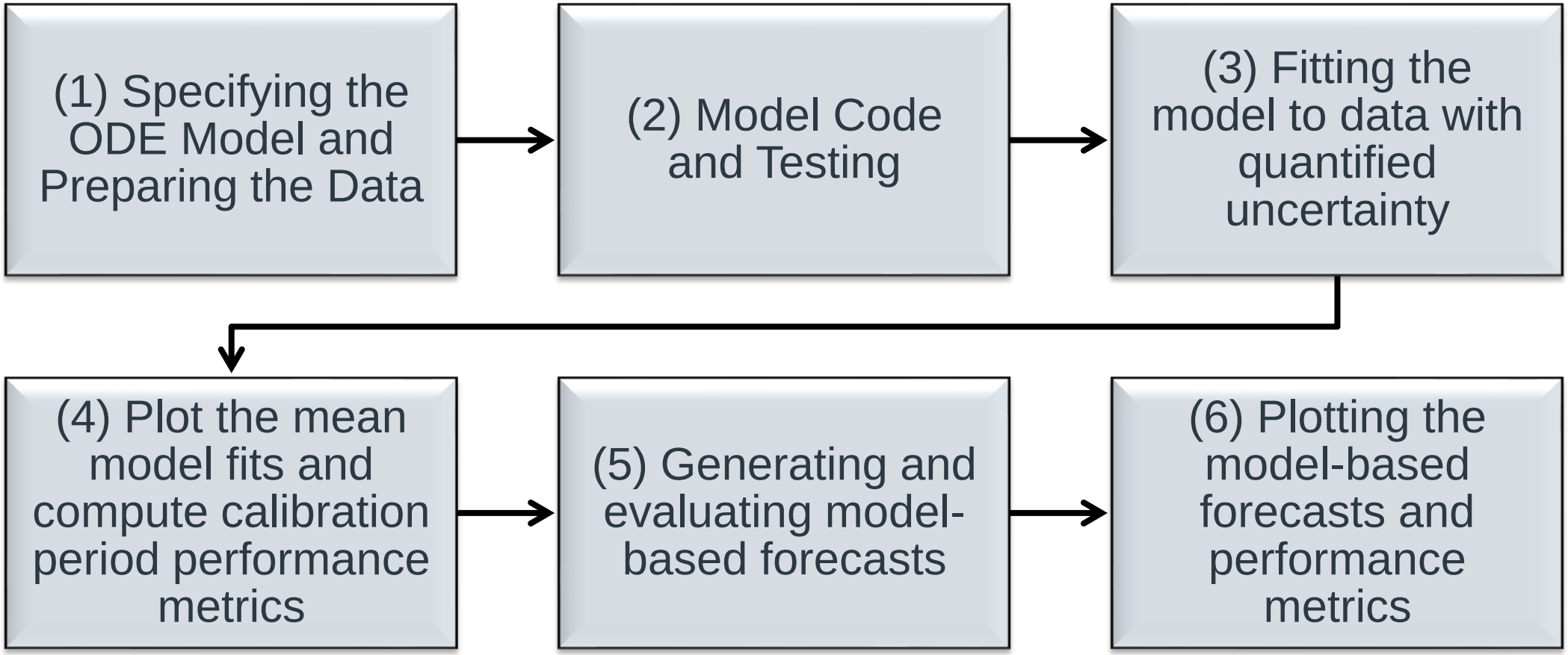

MATLAB R2023a - academic use
HOME
PLOTS
APPS
EDITOR
PUBLISH
VIEW
Search Documentation
Amanda
New
Open
Save
Compare
Print
FILE
Go To
Find
Bookmark
NAVIGATE
Refactor
CODE
Profiler
Analyze
ANALYZE
Run Section
Section Break
Run and Advance
Run to End
SECTION
Run
Step
Stop
RUN
C: ▸ Program Files ▸ MATLAB ▸ R2023a ▸
Current Folder
Name
VersionInfo.xml
trademarks.txt
patents.txt
license_agreement.txt
uninstall
ui
toolbox
sys
simulink
rtw
resources
remote
polyspace
platform
lib
java
interprocess
help
extern
derived
cefclient
bin
appdata
Details
Select a file to view details
Editor - untitled2
untitled2
1
Work...
Name
Command Window
Warning: "C:\Users\ablei\Documents\Georgia State R\MonkeyPox\Current Forecast - CDC + OWH\All Forecast" using the Custom Working Folder preference co
Using "C:\Program Files\MATLAB\R2023a" as the initial working folder instead.
>>
Ready
Zoom: 80%
UTF-8
CRLF
script
Ln 1
Col 1


MATLAB R2023a - academic use
HOME
PLOTS
APPS
EDITOR
PUBLISH
VIEW
Search Documentation
Amanda
New
Open
Save
Compare
Print
FILE
Go To
Find
Bookmark
NAVIGATE
Refactor
CODE
Profiler
Analyze
ANALYZE
Run Section
Section Break
Run and Advance
Run to End
SECTION
Run
Step
Stop
RUN
C: ▸ Users ▸ ablei ▸ Desktop ▸ SISMID ▸ Code ▸
Current Folder
Name
forecasting_odemodels code
forecasting_growthmodels code
Editor - untitled2
untitled2
1
Work...
Name
Command Window
Warning: "C:\Users\ablei\Documents\Georgia State R\MonkeyPox\Current Forecast - CDC + OWH\All Forecast" using the Custom Working Folder preference cc
Using "C:\Program Files\MATLAB\R2023a" as the initial working folder instead.
fx >>
forecasting_odemodels code (Folder)
No details available


MATLAB R2023a - academic use
HOME
PLOTS
APPS
EDITOR
PUBLISH
VIEW
Search Documentation
Amanda
New
Open
Save
Compare
Print
FILE
Go To
Find
Bookmark
NAVIGATE
Refactor
CODE
Profiler
Analyze
ANALYZE
Run Section
Section Break
Run and Advance
Run to End
SECTION
Run
Step
Stop
RUN
C: ▸ Users ▸ ablei ▸ Desktop ▸ SISMID ▸ Code ▸
Current Folder
Name
forecasting_odemodel
forecasting_growthmo
Open Enter
Show in Explorer
View Class Diagram
Create Zip File
Rename F2
Delete Delete
New
Compare Selected Files/Folders
Compare Against
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Add to Path
Indicate Files Not on Path
Refresh F5
forecasting_odemodels code (Folder)
No details available
Editor - untitled2
untitled2
1
Work...
Name
Command Window
Warning: "C:\Users\ablei\Documents\Georgia State R\MonkeyPox\Current Forecast - CDC + OWH\All Forecast" using the Custom Working Folder preference cc
Using "C:\Program Files\MATLAB\R2023a" as the initial working folder instead.
>>


MATLAB R2023a - academic use
HOME
PLOTS
APPS
EDITOR
PUBLISH
VIEW
Search Documentation
Amanda
New
Open
Save
Compare
Print
FILE
Go To
Find
Bookmark
NAVIGATE
Refactor
CODE
Profiler
Analyze
ANALYZE
Run Section
Section Break
Run and Advance
Run to End
SECTION
Run
Step
Stop
RUN
C: ▸ Users ▸ ablei ▸ Desktop ▸ SISMID ▸ Code ▸
Current Folder
Name
forecasting_odemodels code
forecasting_growthmodels code
Open Enter
Show in Explorer
View Class Diagram
Create Zip File
Rename F2
Delete Delete
New
Compare Selected Files/Folders
Compare Against
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Add to Path
Indicate Files Not on Path
Refresh F5
Selected Folders
Selected Folders and Subfolders
Editor - untitled2
untitled2
Work...
Name
Command Window
Warning: "C:\Users\ablei\Documents\Georgia State R\MonkeyPox\Current Forecast - CDC + OWH\All Forecast" using the Custom Working Folder preference cc
Using "C:\Program Files\MATLAB\R2023a" as the initial working folder instead.
>>
forecasting_odemodels code (Folder)
No details available
Ready

Workflow


(1) Specifying the ODE Model and Preparing the Data
(2) Model Code and Testing
(3) Fitting the model to data with quantified uncertainty
(4) Plot the mean model fits and compute calibration period performance metrics
(5) Generating and evaluating model-based forecasts
(6) Plotting the model-based forecasts and performance metrics