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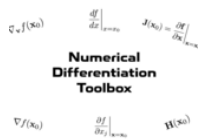
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[[View Numerical Differentiation Toolbox on File Exchange](https://www.mathworks.com/matlabcentral/)

[Copy Markdown](#)**Numerical Differentiation Toolbox**

version 6.1.0 (3.69 MB) by Tamas Kis

Functions to evaluate derivatives, partial derivatives, gradients, directional derivatives, Jacobians, and Hessians.

https://github.com/tamaskis/Numerical_Differentiation_Toolbox-MATLAB

★★★★★ (0)

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From GitHub

[View Version History](#)[View license on GitHub](#)[x Unfollow](#)[Download](#)[Overview](#)[Functions](#)[Reviews \(0\)](#)[Discussions \(0\)](#)**Numerical Differentiation Toolbox**

This toolbox supplies functions to evaluate derivatives, partial derivatives, gradients, directional derivatives, Jacobians, and Hessians using the forward difference, central difference, and complex-step approximations of a derivative.

Documentation[Toolbox Documentation](#)[Technical Documentation](#)

To open the home page of the toolbox documentation in MATLAB, type

in the Command Window. To open the documentation of a specific function with name `function_name` from the Command Window, type

doc_NDT function_name

To open the PDF file with the technical documentation
(Numerical_Differentiation_using_Finite_Difference_and_Complex_Step_Approximations.pdf) from the Command Window, type

doc_NDT tech

Complex-Step Differentiation Functions

```
df = iderivative(f,x0)
pf = ipartial(f,x0,k)
g = igradient(f,x0)
Dv = idirectional(f,x0,v)
J = ijacobian(f,x0)
H = ihessian(f,x0)
```

"Complexified" Functions

```
y = iabs(x)
z = iatan2(y,x)
z = iatan2d(y,x)
z = idot(x,y)
m = imax(x1,x2)
m = imin(x1,x2)
r = imod(a,n)
y = inorm(x)
```

Central Difference Differentiation Functions

```
df = cderivative(f,x0)
pf = cpartial(f,x0,k)
g = cgradient(f,x0)
Dv = cdirectional(f,x0,v)
J = cjacobian(f,x0)
H = chessian(f,x0)
```

Forward Difference Differentiation Functions

```
df = fderivative(f,x0)
pf = fpartial(f,x0,k)
g = fgradient(f,x0)
Dv = fdirectional(f,x0,v)
J = fjacobian(f,x0)
H = fhessian(f,x0)
```

Cite As

Tamas Kis (2022). Numerical Differentiation Toolbox (https://github.com/tamaskis/Numerical_Differentiation_Toolbox-MATLAB/releases/tag/v6.1.0), GitHub. Retrieved April 27, 2022.

Requires

MATLAB

MATLAB Release Compatibility

Created with R2021b
Compatible with any release

Platform Compatibility

☒ Windows ☒ macOS ☒ Linux

Tags Add Tags

backward difference
x

central difference
x

complex-step
x

differentiation
x

directional deriv...
x

finite difference
x

forward difference
x

gradient
x

hessian
x

jacobian
x

partial derivative
x

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Poll

What is your main tool or approach for debugging MATLAB code?

- ☐ Set breakpoints
- ☐ Run with "Pause On Errors"
- ☐ The dbstop() command
- ☐ Pause the code with keyboard()
- ☐ Get help from Matlab Community
- ☐ Other

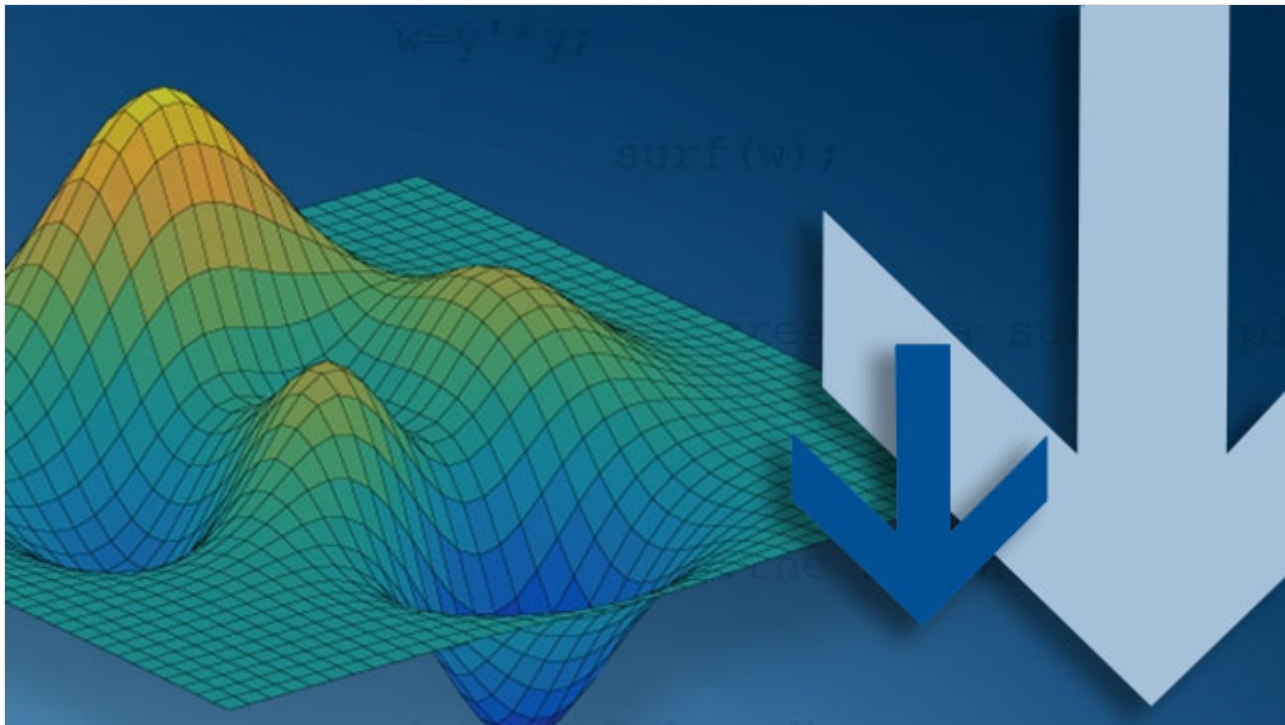
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iatan2_igradient_test.m

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imin_test.m

inorm_test.m

toolbox/centraldifference

cderivative

cdirectional

cgradient

chessian

cjacobian

cpartial

toolbox/complexified

iabs

iatan2

iatan2d

idot

imax

imin

imod

inorm

toolbox/complexstep

iderivative

idirectional

igradient

ihessian

ijacobian

ipartial

toolbox/doc

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toolbox/forwarddifference

fderivative

fdirectional

fgradient

fhessian

fjacobian

fpartial

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