

notebook

July 20, 2023

```
[ ]: import os
os.chdir("../..")
print("current working directory: " + os.getcwd())
```

```
current working directory:
c:\Users\bcynuaa\Desktop\LocalProject\Help\CFDPostFlutterHelp\CODE\AoABuffet-
FluentBackend
```

```
[ ]: from src.classes.AoAFinder import AoAFinder
aoa_finder: AoAFinder = AoAFinder()
```

```
config: FluentSettings.py loaded
config: CalculationSettings.py loaded
config: AoAFinderSettings.py loaded
utils: Path.py loaded
decorator: Clock.py is imported.
classes: CalculationTask.py loaded
classes: AoAFinder.py loaded
```

```
[ ]: mesh_filename: str = "C://AoABuffet-FluentBackend//Mesh//001t010.cas"
mach: float = 0.76
aoa_finder.setMeshFilename(mesh_filename)
aoa_finder.setMach(mach)
save_path: str = "examples//001t010mach0.76//"
```

```
[ ]: aoa_finder.autoCalculate()
```

```
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_0.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_0.500\start.jou
task finished with return code: 0
mach: 0.76, AoA: 0.50, CL: 0.5848, CD: 0.0102
Function autoCalculate costs 0.0019996166229248047 seconds.
```

```
-----
--
```

```
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_0.600
```

```

tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_0.600\start.jou
task finished with return code: 0
mach: 0.76, AoA: 0.60, CL: 0.6048, CD: 0.0107
Function autoCalculate costs 0.001999378204345703 seconds.
-----
--
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_0.700
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_0.700\start.jou
task finished with return code: 0
mach: 0.76, AoA: 0.70, CL: 0.6255, CD: 0.0103
Function autoCalculate costs 0.0009999275207519531 seconds.
-----
--
Clalpha0: 0.2038
Function calculateClalpha0 costs 0.006998777389526367 seconds.
-----
--
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_1.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_1.500\start.jou
task finished with return code: 0
mach: 0.76, AoA: 1.50, CL: 0.8140, CD: 0.0142
Function autoCalculate costs 0.0009999275207519531 seconds.
-----
--
Clalpha0: 0.2038
current min Clalpha: 0.1998
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_2.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_2.500\start.jou
task finished with return code: 0
mach: 0.76, AoA: 2.50, CL: 0.9724, CD: 0.0308
Function autoCalculate costs 0.0019998550415039062 seconds.
-----
--
Clalpha0: 0.2038
current min Clalpha: 0.1585
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_3.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_3.500\start.jou
task finished with return code: 0
mach: 0.76, AoA: 3.50, CL: 1.0253, CD: 0.0496

```

Function autoCalculate costs 0.0009996891021728516 seconds.

--

Clalpha0: 0.2038

current min Clalpha: 0.0529

Function locateWhereBuffet costs 0.006999969482421875 seconds.

--

AoA lhs: 2.5000, AoA rhs: 3.5000

task folder created: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_3.000

tui commands written: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_3.000\start.jou

task finished with return code: 0

mach: 0.76, AoA: 3.00, CL: 1.0047, CD: 0.0404

Function autoCalculate costs 0.0020003318786621094 seconds.

--

AoA lhs: 1.5000, AoA rhs: 2.5000

task folder created: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_2.000

tui commands written: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_2.000\start.jou

task finished with return code: 0

mach: 0.76, AoA: 2.00, CL: 0.9143, CD: 0.0215

Function autoCalculate costs 0.0010001659393310547 seconds.

--

AoA lhs: 2.0000, AoA rhs: 2.5000

task folder created: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_2.250

tui commands written: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_2.250\start.jou

task finished with return code: 0

mach: 0.76, AoA: 2.25, CL: 0.9462, CD: 0.0261

Function autoCalculate costs 0.0009999275207519531 seconds.

--

AoA lhs: 2.2500, AoA rhs: 2.5000

task folder created: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_2.375

tui commands written: C://AoABuffet-

FluentBackend//Data\001t010\mach_0.760\AoA_2.375\start.jou

task finished with return code: 0

mach: 0.76, AoA: 2.38, CL: 0.9608, CD: 0.0285

Function autoCalculate costs 0.0009996891021728516 seconds.

--

```

AoA lhs: 2.3750, AoA rhs: 2.5000
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_2.438
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.760\AoA_2.438\start.jou
task finished with return code: 0
mach: 0.76, AoA: 2.44, CL: 0.9671, CD: 0.0297
Function autoCalculate costs 0.0009999275207519531 seconds.

```

```

-----
--
Function refineWhereBuffet costs 0.012999773025512695 seconds.
-----
--
Function autoCalculate costs 0.027998685836791992 seconds.
-----
--

```

```
[ ]: aoa_finder.dataframe
```

```
[ ]:
   mach   AoA      CL   Clalpha      CD iterations \
0   0.76  0.5000  0.584783  0.199804  0.010216      2500
1   0.76  0.6000  0.604763  0.203803  0.010699      2500
2   0.76  0.7000  0.625543  0.210884  0.010264      2500
3   0.76  1.5000  0.813983  0.214061  0.014160      2500
4   0.76  2.0000  0.914298  0.151843  0.021498      2500
5   0.76  2.2500  0.946160  0.120695  0.026070      2500
6   0.76  2.3750  0.960825  0.105774  0.028502      2500
20  0.76  2.4375  0.967075  0.092940  0.029683      2500
7   0.76  2.5000  0.972443  0.083499  0.030828      2500
8   0.76  3.0000  1.004676  0.052887  0.040412      2500
9   0.76  3.5000  1.025330  0.041307  0.049573      2500

```

```

                                     cmd \
0   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
1   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
2   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
3   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
4   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
5   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
6   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
20  C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
7   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
8   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...
9   C://SoftWare//Ansys//ANSYS Inc//v222//fluent//...

```

```

                                     task folder \
0   C://AoABuffet-FluentBackend//Data\001t010\mach...

```

```

1 C://AoABuffet-FluentBackend//Data\001t010\mach...
2 C://AoABuffet-FluentBackend//Data\001t010\mach...
3 C://AoABuffet-FluentBackend//Data\001t010\mach...
4 C://AoABuffet-FluentBackend//Data\001t010\mach...
5 C://AoABuffet-FluentBackend//Data\001t010\mach...
6 C://AoABuffet-FluentBackend//Data\001t010\mach...
20 C://AoABuffet-FluentBackend//Data\001t010\mach...
7 C://AoABuffet-FluentBackend//Data\001t010\mach...
8 C://AoABuffet-FluentBackend//Data\001t010\mach...
9 C://AoABuffet-FluentBackend//Data\001t010\mach...

```

read case filename \

```

0 C://AoABuffet-FluentBackend//Mesh//001t010.cas
1 C://AoABuffet-FluentBackend//Mesh//001t010.cas
2 C://AoABuffet-FluentBackend//Mesh//001t010.cas
3 C://AoABuffet-FluentBackend//Mesh//001t010.cas
4 C://AoABuffet-FluentBackend//Mesh//001t010.cas
5 C://AoABuffet-FluentBackend//Mesh//001t010.cas
6 C://AoABuffet-FluentBackend//Mesh//001t010.cas
20 C://AoABuffet-FluentBackend//Mesh//001t010.cas
7 C://AoABuffet-FluentBackend//Mesh//001t010.cas
8 C://AoABuffet-FluentBackend//Mesh//001t010.cas
9 C://AoABuffet-FluentBackend//Mesh//001t010.cas

```

write case filename \

```

0 C://AoABuffet-FluentBackend//Data\001t010\mach...
1 C://AoABuffet-FluentBackend//Data\001t010\mach...
2 C://AoABuffet-FluentBackend//Data\001t010\mach...
3 C://AoABuffet-FluentBackend//Data\001t010\mach...
4 C://AoABuffet-FluentBackend//Data\001t010\mach...
5 C://AoABuffet-FluentBackend//Data\001t010\mach...
6 C://AoABuffet-FluentBackend//Data\001t010\mach...
20 C://AoABuffet-FluentBackend//Data\001t010\mach...
7 C://AoABuffet-FluentBackend//Data\001t010\mach...
8 C://AoABuffet-FluentBackend//Data\001t010\mach...
9 C://AoABuffet-FluentBackend//Data\001t010\mach...

```

cd report filename \

```

0 C://AoABuffet-FluentBackend//Data\001t010\mach...
1 C://AoABuffet-FluentBackend//Data\001t010\mach...
2 C://AoABuffet-FluentBackend//Data\001t010\mach...
3 C://AoABuffet-FluentBackend//Data\001t010\mach...
4 C://AoABuffet-FluentBackend//Data\001t010\mach...
5 C://AoABuffet-FluentBackend//Data\001t010\mach...
6 C://AoABuffet-FluentBackend//Data\001t010\mach...
20 C://AoABuffet-FluentBackend//Data\001t010\mach...
7 C://AoABuffet-FluentBackend//Data\001t010\mach...

```

```

8 C://AoABuffet-FluentBackend//Data\001t010\mach...
9 C://AoABuffet-FluentBackend//Data\001t010\mach...

```

```

                                cl report filename \
0 C://AoABuffet-FluentBackend//Data\001t010\mach...
1 C://AoABuffet-FluentBackend//Data\001t010\mach...
2 C://AoABuffet-FluentBackend//Data\001t010\mach...
3 C://AoABuffet-FluentBackend//Data\001t010\mach...
4 C://AoABuffet-FluentBackend//Data\001t010\mach...
5 C://AoABuffet-FluentBackend//Data\001t010\mach...
6 C://AoABuffet-FluentBackend//Data\001t010\mach...
20 C://AoABuffet-FluentBackend//Data\001t010\mach...
7 C://AoABuffet-FluentBackend//Data\001t010\mach...
8 C://AoABuffet-FluentBackend//Data\001t010\mach...
9 C://AoABuffet-FluentBackend//Data\001t010\mach...

```

```

                                tui commands filename return code
0 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
1 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
2 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
3 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
4 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
5 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
6 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
20 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
7 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
8 C://AoABuffet-FluentBackend//Data\001t010\mach...      0
9 C://AoABuffet-FluentBackend//Data\001t010\mach...      0

```

```

[ ]: aoa_finder.drawAoACL()
     aoa_finder.figure_AoACL.show()

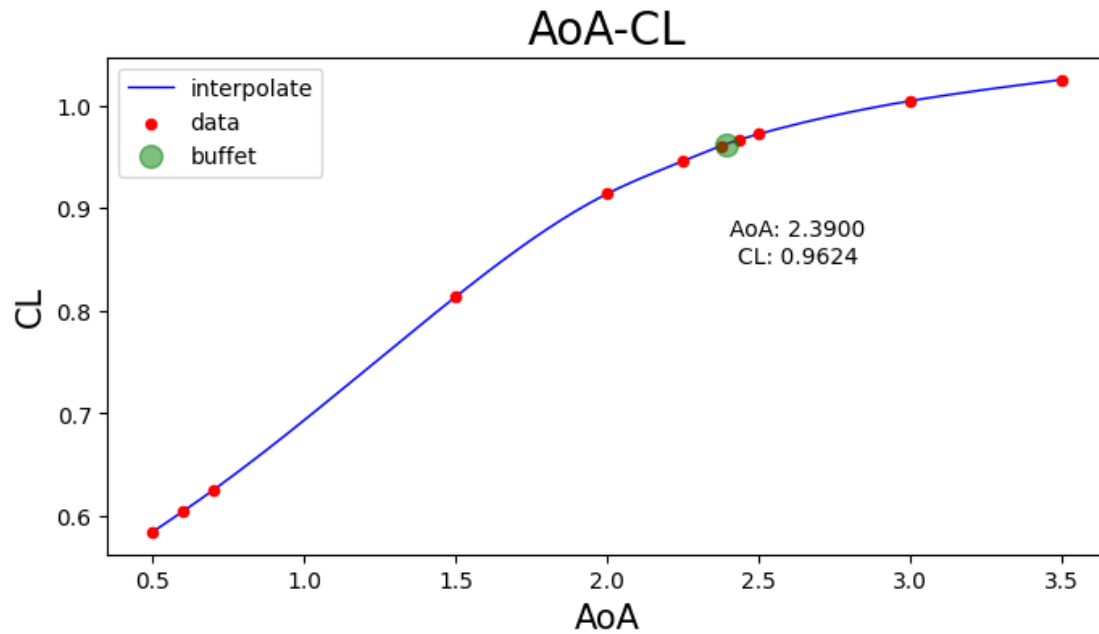
```

C:\Users\bcynuaa\AppData\Local\Temp\ipykernel_2212\1100355274.py:2: UserWarning: Matplotlib is currently using module://matplotlib_inline.backend_inline, which is a non-GUI backend, so cannot show the figure.

```

    aoa_finder.figure_AoACL.show()

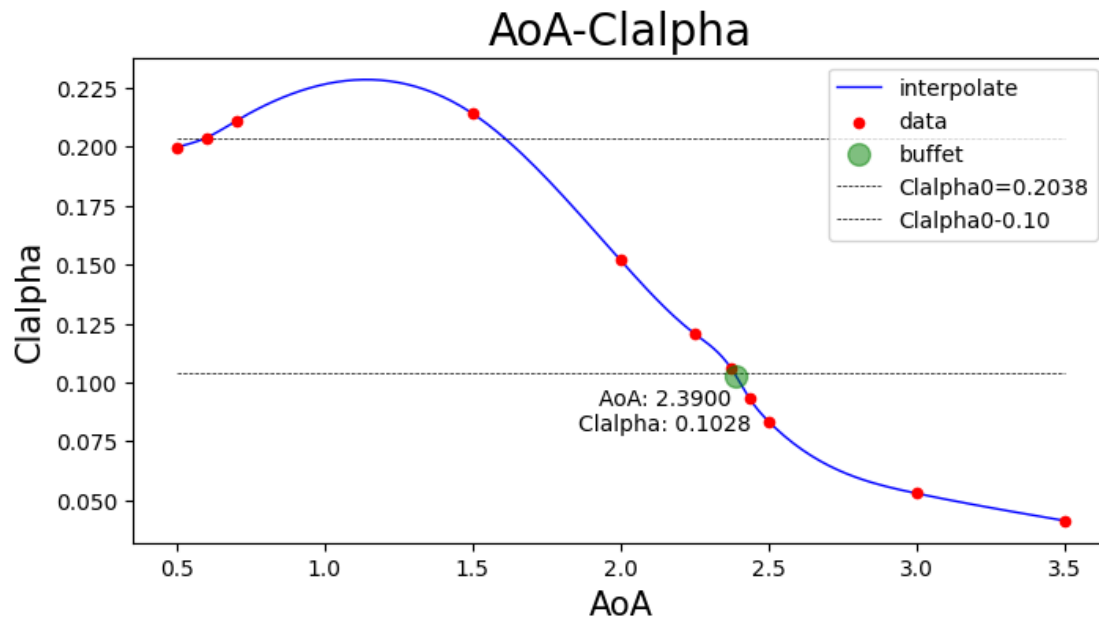
```



```
[ ]: aoa_finder.drawAoAClalpha()
      aoa_finder.figure_AoAClalpha.show()
```

C:\Users\bcynuaa\AppData\Local\Temp\ipykernel_2212\508962497.py:2: UserWarning: Matplotlib is currently using module://matplotlib_inline.backend_inline, which is a non-GUI backend, so cannot show the figure.

```
      aoa_finder.figure_AoAClalpha.show()
```



```
[ ]: aoa_finder.dataframe.to_csv(os.path.join(save_path, "dataframe.csv"),  
    ↪ index=False)  
    aoa_finder.figure_AoACL.savefig(os.path.join(save_path, "AoACL.png"))  
    aoa_finder.figure_AoAClalpha.savefig(os.path.join(save_path, "AoAClalpha.png"))
```