

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 = 0.72
aoa_finder.setMeshFilename(mesh_filename)
aoa_finder.setMach(mach)
save_path: str = "examples//001t010mach0.72/"
```

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

```
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_0.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_0.500\start.jou
task finished with return code: 0
mach: 0.72, AoA: 0.50, CL: 0.5300, CD: 0.0093
Function autoCalculate costs 120.53125619888306 seconds.
```

--

```
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_0.600
```

```

tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_0.600\start.jou
task finished with return code: 0
mach: 0.72, AoA: 0.60, CL: 0.5482, CD: 0.0093
Function autoCalculate costs 125.26371765136719 seconds.
-----
--
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_0.700
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_0.700\start.jou
task finished with return code: 0
mach: 0.72, AoA: 0.70, CL: 0.5646, CD: 0.0098
Function autoCalculate costs 125.07427477836609 seconds.
-----
--
Clalpha0: 0.1733
Function calculateClalpha0 costs 370.87224769592285 seconds.
-----
--
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_1.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_1.500\start.jou
task finished with return code: 0
mach: 0.72, AoA: 1.50, CL: 0.7070, CD: 0.0114
Function autoCalculate costs 149.17094898223877 seconds.
-----
--
Clalpha0: 0.1733
current min Clalpha: 0.1660
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_2.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_2.500\start.jou
task finished with return code: 0
mach: 0.72, AoA: 2.50, CL: 0.9018, CD: 0.0176
Function autoCalculate costs 142.58927130699158 seconds.
-----
--
Clalpha0: 0.1733
current min Clalpha: 0.1660
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.500\start.jou
task finished with return code: 0
mach: 0.72, AoA: 3.50, CL: 1.0544, CD: 0.0333

```

Function autoCalculate costs 142.64577507972717 seconds.

--

Clalpha0: 0.1733
current min Clalpha: 0.1526
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_4.500
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_4.500\start.jou
task finished with return code: 0
mach: 0.72, AoA: 4.50, CL: 1.0770, CD: 0.0512
Function autoCalculate costs 158.62904572486877 seconds.

--

Clalpha0: 0.1733
current min Clalpha: 0.0226
Function locateWhereBuffet costs 593.0390479564667 seconds.

--

AoA lhs: 3.5000, AoA rhs: 4.5000
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_4.000
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_4.000\start.jou
task finished with return code: 0
mach: 0.72, AoA: 4.00, CL: 1.0862, CD: 0.0425
Function autoCalculate costs 128.47793292999268 seconds.

--

AoA lhs: 3.5000, AoA rhs: 4.0000
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.750
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.750\start.jou
task finished with return code: 0
mach: 0.72, AoA: 3.75, CL: 1.0771, CD: 0.0381
Function autoCalculate costs 126.66035103797913 seconds.

--

AoA lhs: 3.5000, AoA rhs: 3.7500
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.625
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.625\start.jou
task finished with return code: 0
mach: 0.72, AoA: 3.62, CL: 1.0676, CD: 0.0357
Function autoCalculate costs 139.1231837272644 seconds.

```
--
AoA lhs: 3.6250, AoA rhs: 3.7500
task folder created: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.688
tui commands written: C://AoABuffet-
FluentBackend//Data\001t010\mach_0.720\AoA_3.688\start.jou
task finished with return code: 0
mach: 0.72, AoA: 3.69, CL: 1.0728, CD: 0.0368
Function autoCalculate costs 147.09956622123718 seconds.
```

```
-----
--
Function refineWhereBuffet costs 541.3690311908722 seconds.
```

```
-----
--
Function autoCalculate costs 1505.281327009201 seconds.
```

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

```
[ ]:      mach      AoA      CL      Clalpha      CD iterations \
0      0.72      0.5000      0.529982      0.182014      0.009348      2500
1      0.72      0.6000      0.548183      0.173261      0.009289      2500
2      0.72      0.7000      0.564634      0.166003      0.009821      2500
3      0.72      1.5000      0.706998      0.185424      0.011438      2500
4      0.72      2.5000      0.901758      0.173682      0.017576      2500
5      0.72      3.5000      1.054362      0.111281      0.033348      2500
6      0.72      3.6250      1.067627      0.090835      0.035655      2500
20     0.72      3.6875      1.072826      0.076026      0.036829      2500
7      0.72      3.7500      1.077130      0.062338      0.038085      2500
8      0.72      4.0000      1.086196      0.018018      0.042493      2500
9      0.72      4.5000      1.076959      -0.018474      0.051150      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

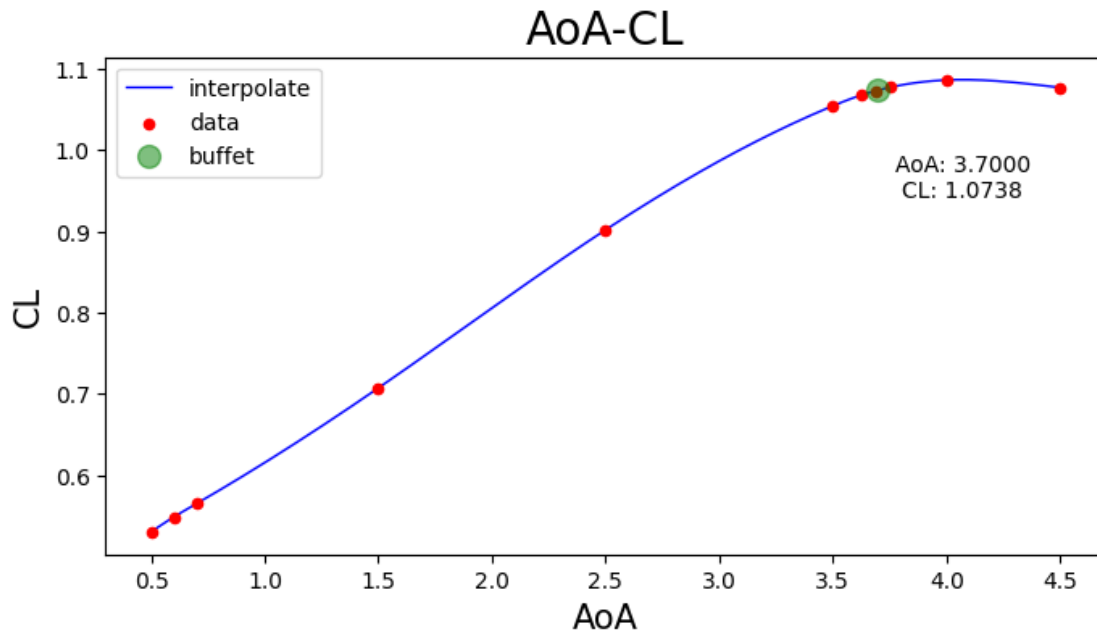
```

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

```

C:\Users\bcynuaa\AppData\Local\Temp\ipykernel_6176\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()

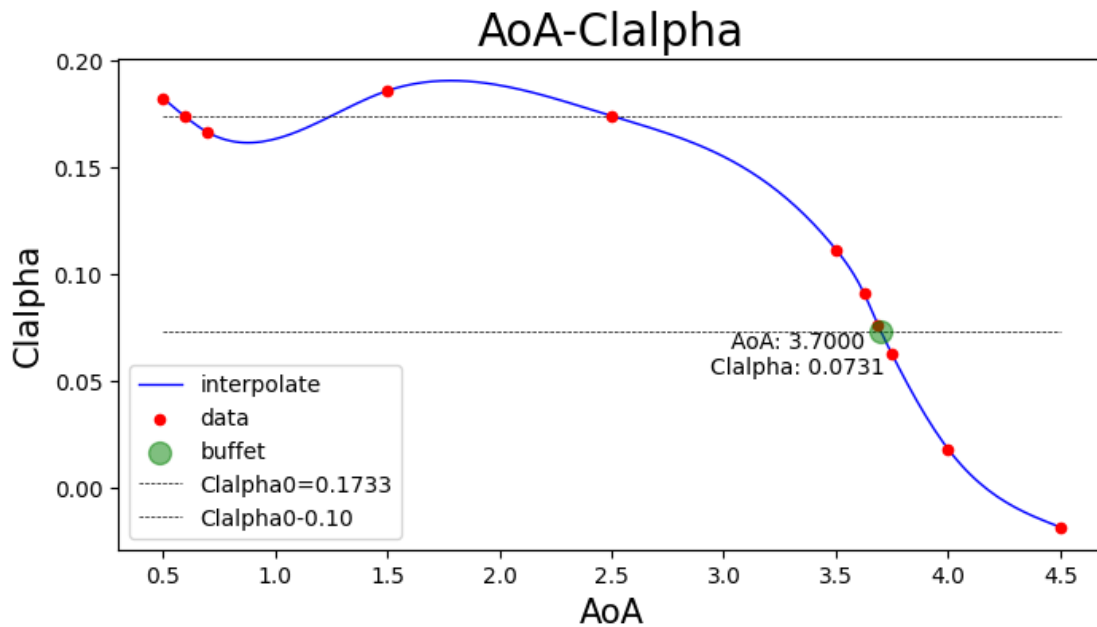
```



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

C:\Users\bcynuaa\AppData\Local\Temp\ipykernel_6176\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"))
```