Pattern matching for fog

Using 3pm observations (T,Td, QNH, Winds) with 9am sonde data for next morning (low level winds and lapse rates)

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |

Eyeballing above Density functions for fog and non-fog events we can see that if we use a probabillity threshold of about 0.1 for cut off we have highest detection rate 104/138

d.loc[~d['fogflag'],'chance'].describe()

count 1171.000000

mean 0.092443

std 0.080703

min 0.006536

25% 0.035714

50% 0.066667

75% 0.122010

max 0.666667

d.loc[d['fogflag'],'chance'].describe()

count 138.000000

mean 0.215605

std 0.173788

min 0.022222

25% 0.100000

50% 0.162281

75% 0.297581

max 1.000000

Probability Threshold:0.1. Accuracy:0.66

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 760 ← Hits (correct)

0 | 1 | 411 ← False +ve – incorrect fog call

1 | 0 | 34 ← False -ve – Missed events

1 | 1 | 104 ← Hits (correct)

Probability Threshold:0.11. Accuracy:0.713

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 833

0 | 1 | 338

1 | 0 | 38

1 | 1 | 100

Probability Threshold:0.12. Accuracy:0.738

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 874

0 | 1 | 297

1 | 0 | 46

1 | 1 | 92

Probability Threshold:0.13. Accuracy:0.768

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 916

0 | 1 | 255

1 | 0 | 49

1 | 1 | 89

Probability Threshold:0.14. Accuracy:0.78

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 936

0 | 1 | 235

1 | 0 | 53

1 | 1 | 85

Probability Threshold:0.15. Accuracy:0.786

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 958

0 | 1 | 213

1 | 0 | 67

1 | 1 | 71

Using 9am sonde for same day I.e 9am morning sonde and then 05Z observation

|  |
| --- |
|  |
|  |
|  |
|  |
|  |
|  |

d.loc[~d['fogflag'],'chance'].describe()

count 1351.000000

mean 0.081278

std 0.078550

min 0.005000

25% 0.026316

50% 0.057143

75% 0.105662

max 0.666667

d.loc[d['fogflag'],'chance'].describe()

count 143.000000

mean 0.210578

std 0.189122

min 0.012346

25% 0.090909

50% 0.156250

75% 0.250000

max 1.000000

Probability Threshold:0.1. Accuracy:0.715

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 964

0 | 1 | 387

1 | 0 | 39

1 | 1 | 104

Probability Threshold:0.11. Accuracy:0.749

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 1022

0 | 1 | 329

1 | 0 | 46

1 | 1 | 97

Probability Threshold:0.12. Accuracy:0.776

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 1069

0 | 1 | 282

1 | 0 | 52

1 | 1 | 91

Probability Threshold:0.13. Accuracy:0.797

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 1104

0 | 1 | 247

1 | 0 | 57

1 | 1 | 86

Probability Threshold:0.14. Accuracy:0.809

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 1127

0 | 1 | 224

1 | 0 | 61

1 | 1 | 82

Probability Threshold:0.15. Accuracy:0.826

target\_label | predicted\_label | count

--------------+-----------------+-------

0 | 0 | 1159

0 | 1 | 192

1 | 0 | 68

1 | 1 | 75