

In [66]:

Removing all variables...

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In [66]: `runfile('/Users/derekbivona/Desktop/Bivona_RebootMotion/get_advice.py',  
wdir='/Users/derekbivona/Desktop/Bivona_RebootMotion')`

**Reloaded modules:** `improve_velo`

`improve_velo.py:115: FutureWarning:`

The current behaviour of 'Series.argmax' is deprecated, use 'idxmin' instead.

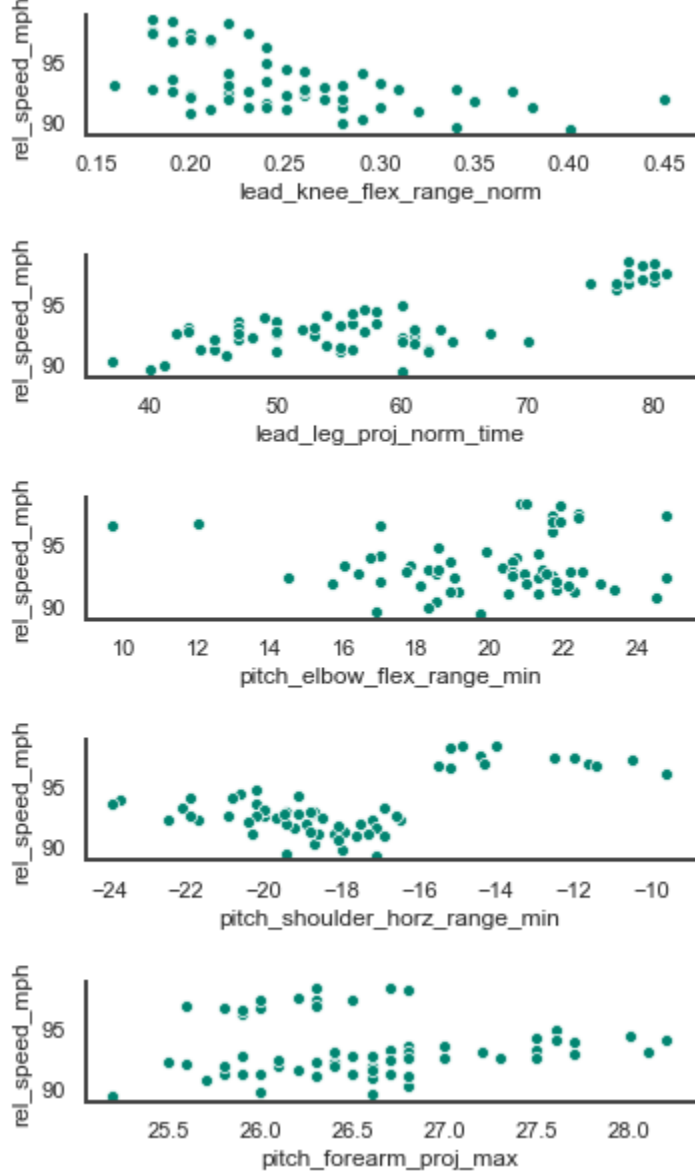
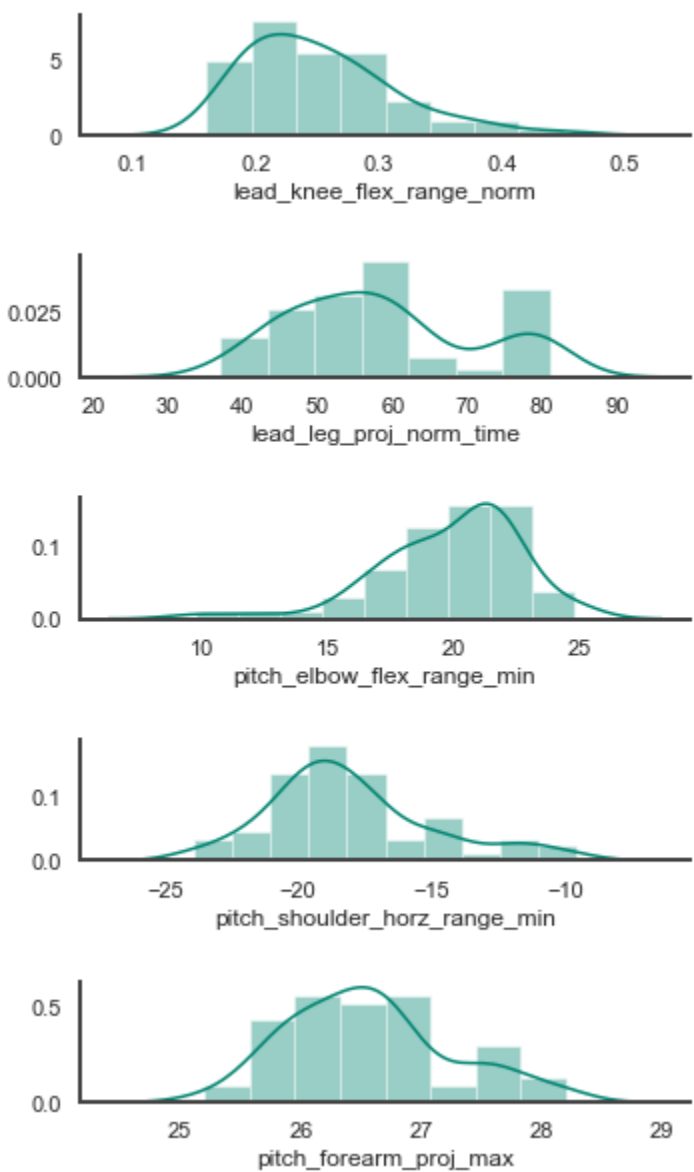
The behavior of 'argmin' will be corrected to return the positional minimum in the future. For now, use 'series.values.argmax' or 'np.argmax(np.array(values))' to get the position of the minimum row.

```
best_feature = new_pval.argmax()
```

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The top 5 features influencing the velocity of this specific pitcher are:

- 1.lead\_knee\_flex\_range\_norm
- 2.lead\_leg\_proj\_norm\_time
- 3.pitch\_elbow\_flex\_range\_min
- 4.pitch\_shoulder\_horz\_range\_min
- 5.pitch\_forearm\_proj\_max

The distribution of each of those parameters along with the relationship with velocity is shown below:

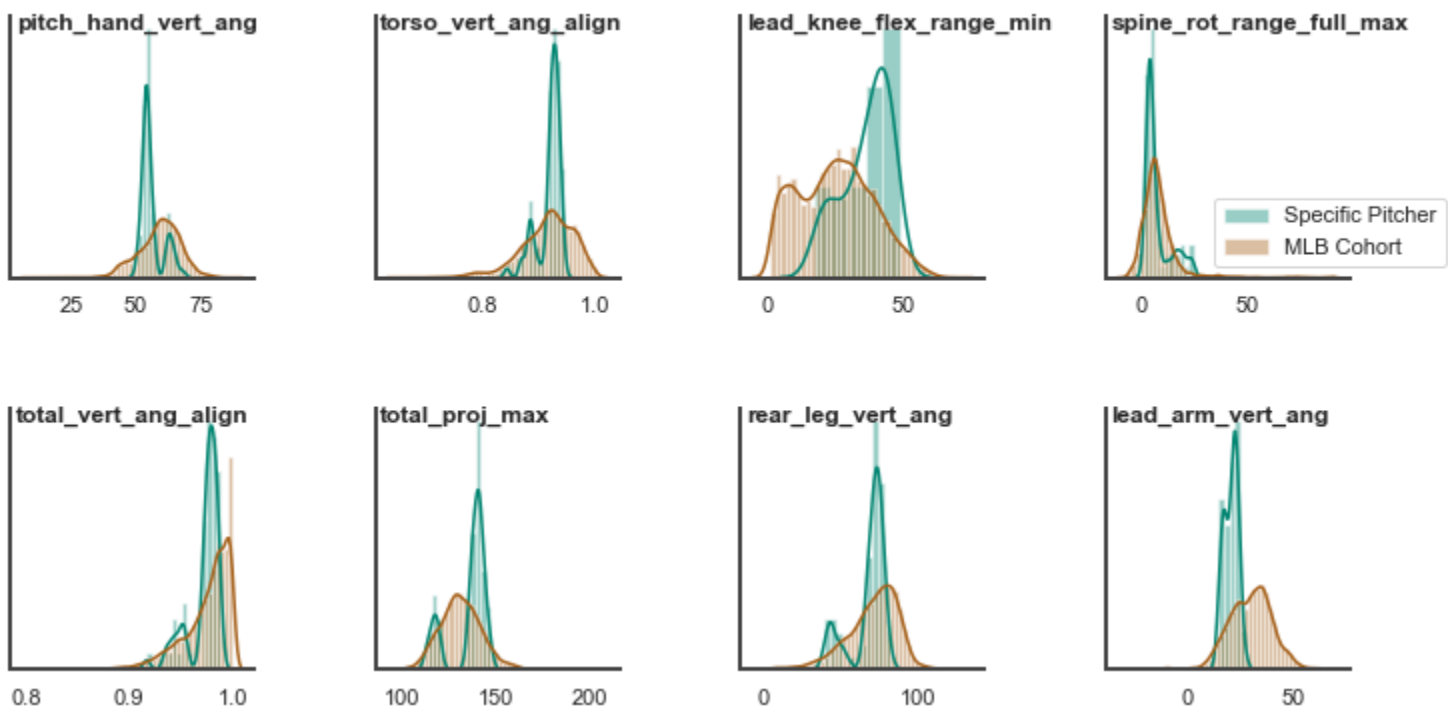


- To increase velocity in the short-term, consider:
- Decreasing your lead\_knee\_flex\_range\_norm
  - Increasing your lead\_leg\_proj\_norm\_time
  - Increasing your pitch\_elbow\_flex\_range\_min
  - Decreasing your pitch\_shoulder\_horz\_range\_min
  - Increasing your pitch\_forearm\_proj\_max

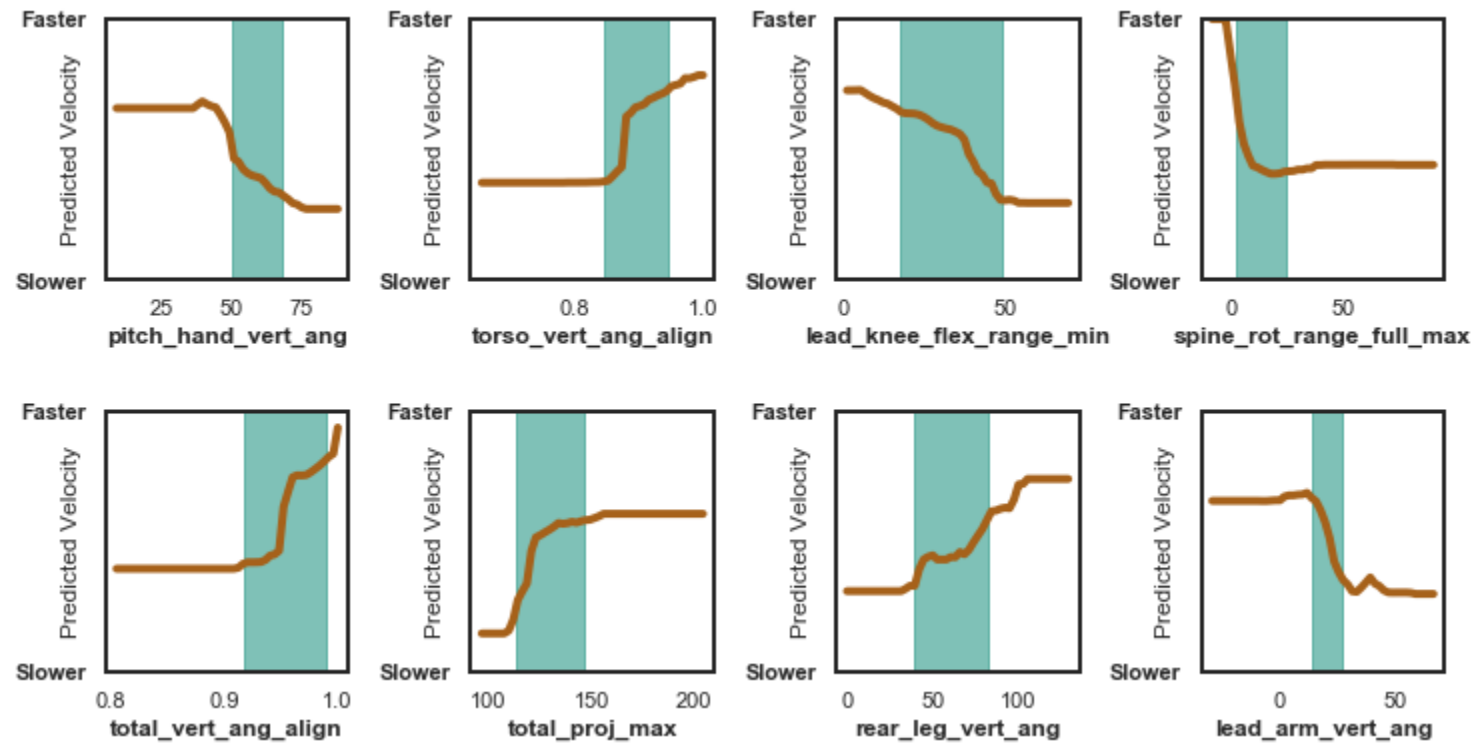
The top 8 features driving absolute velocity (from an MLB cohort) are:

- 1.pitch\_hand\_vert\_ang
- 2.torso\_vert\_ang\_align
- 3.lead\_knee\_flex\_range\_min
- 4.spine\_rot\_range\_full\_max
- 5.total\_vert\_ang\_align
- 6.total\_proj\_max
- 7.rear\_leg\_vert\_ang
- 8.lead\_arm\_vert\_ang

The distributions of each of these parameters for the given pitcher is plotted over the distribution of each for the MLB cohort below:



The relationships generated with our ML model between fastball velocity and given biomechanical parameters are shown below. Highlighted in green is the range of the given pitcher.



To increase your velocity over the long-term, consider:  
 Decreasing your lead\_knee\_flex\_range\_min  
 Increasing your total\_vert\_ang\_align  
 Increasing your rear\_leg\_vert\_ang

In [67]: