

What are you looking at? The Importance of Driver Monitoring

Improving Methods to Measure Attentiveness Through Driver Monitoring

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Distracted driving is a predominant issue in vehicle safety.

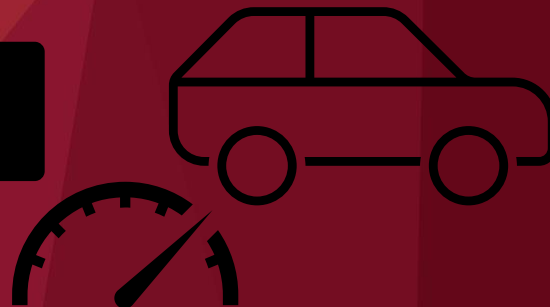
Claimed
3,142
lives in 2019*

- How often is a driver inattentive during one trip?
- Will inattention increase with more advanced vehicles (AVs)?
- How do we measure inattentiveness?
- How and when should we notify the driver when they are being inattentive?

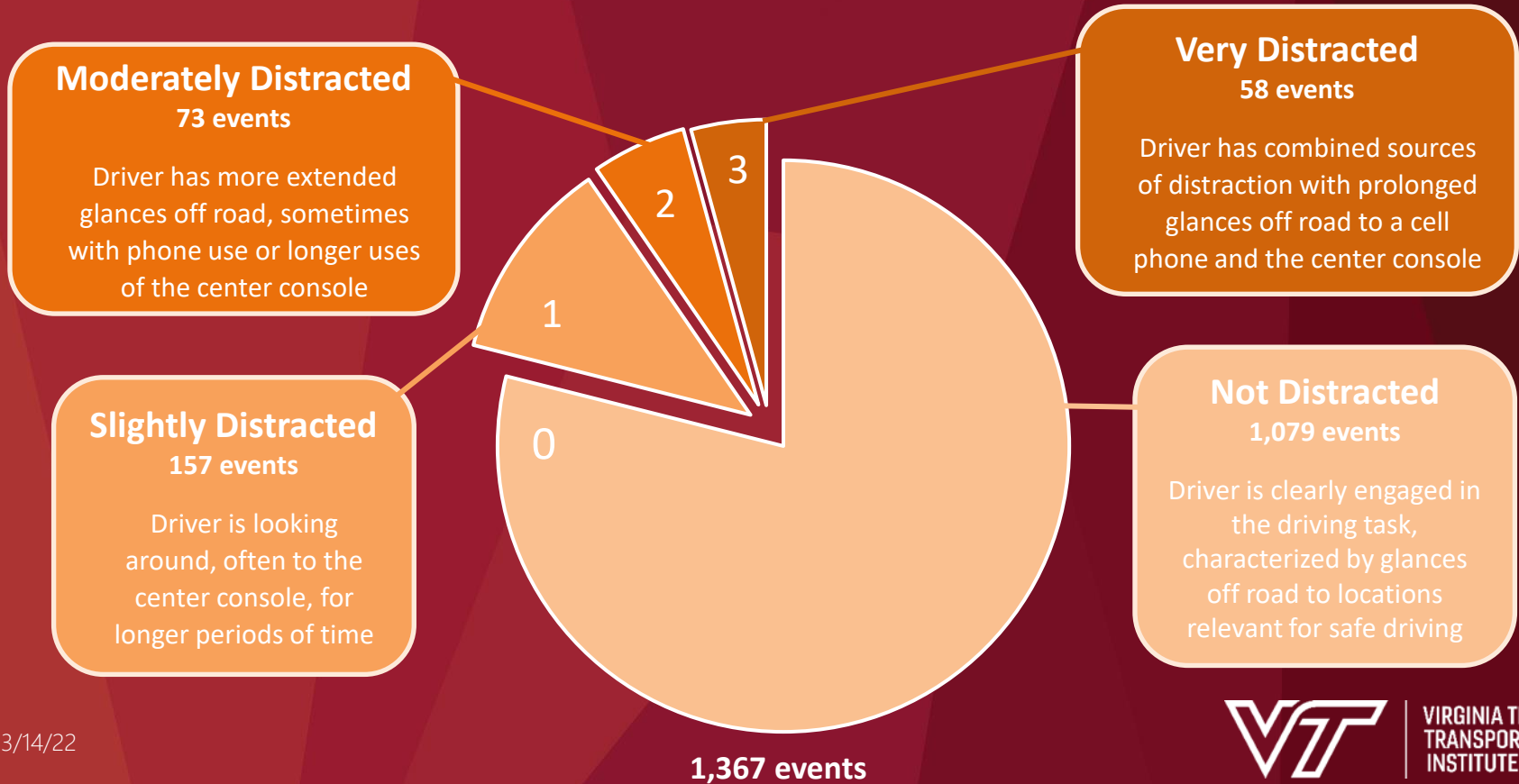
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A privately funded naturalistic driving database was made available to support this study's research objectives.

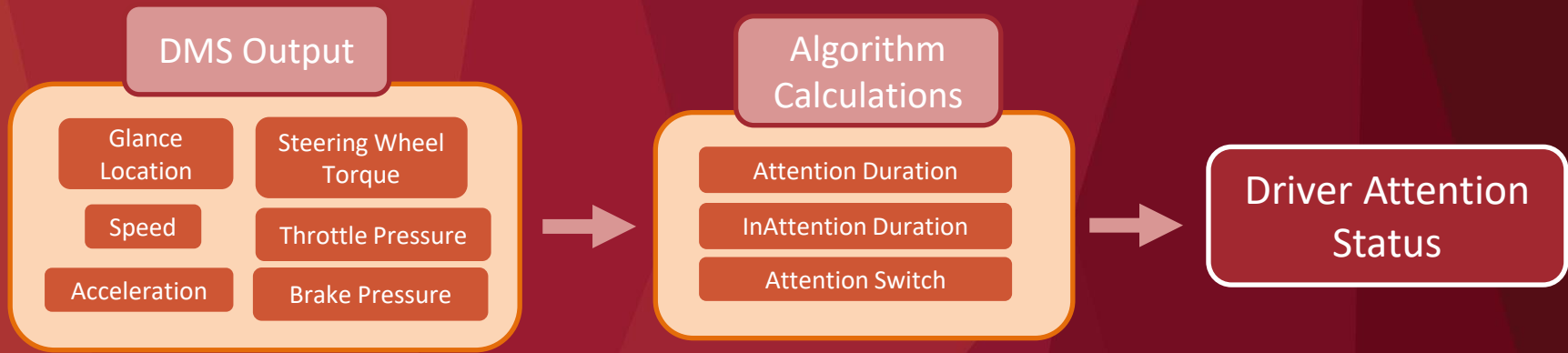
- Individuals recruited to use the equipped research vehicles in place of their personal vehicle
- Collection of DMS output and vehicle parameters, including:
 - Glance Location
 - Speed
 - Acceleration
 - Steering Wheel Torque
 - Throttle Pressure
 - Brake Pressure

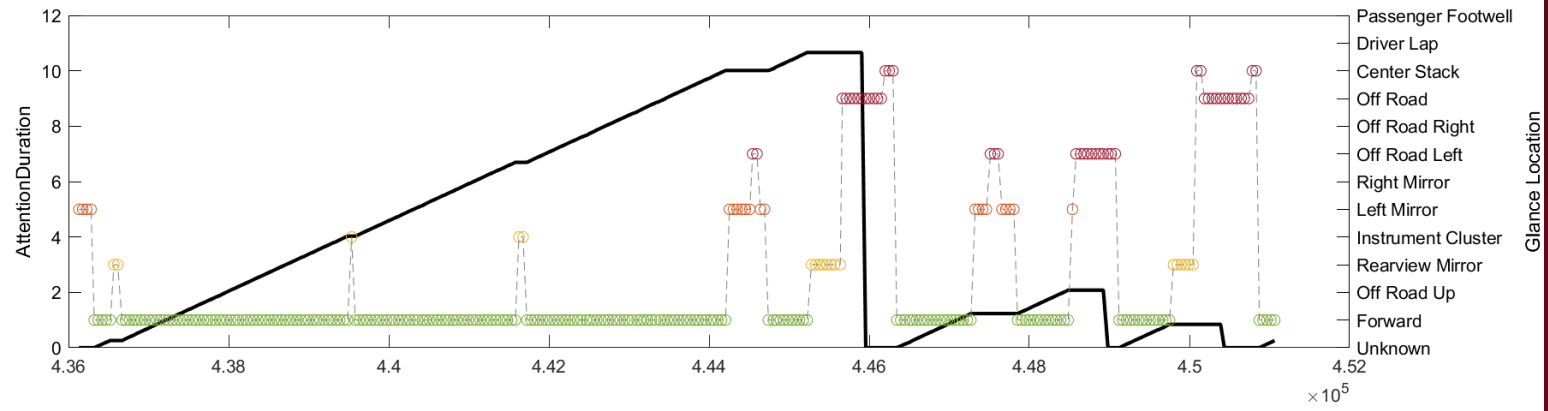
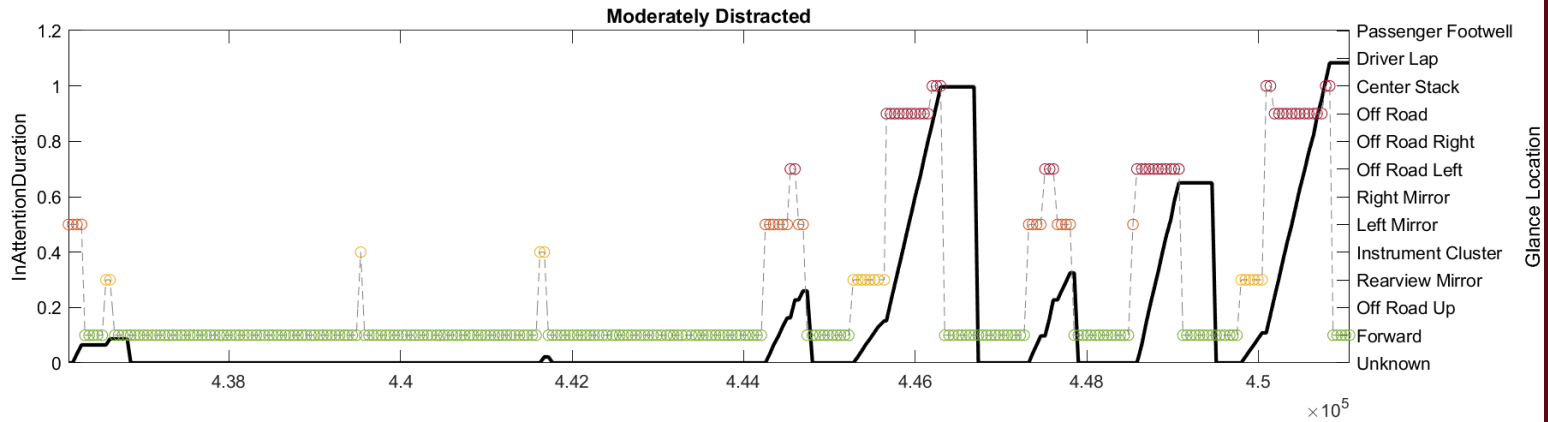


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Given context (10 seconds) before the attention rating, we determined the driver's attention level at the end of the event.



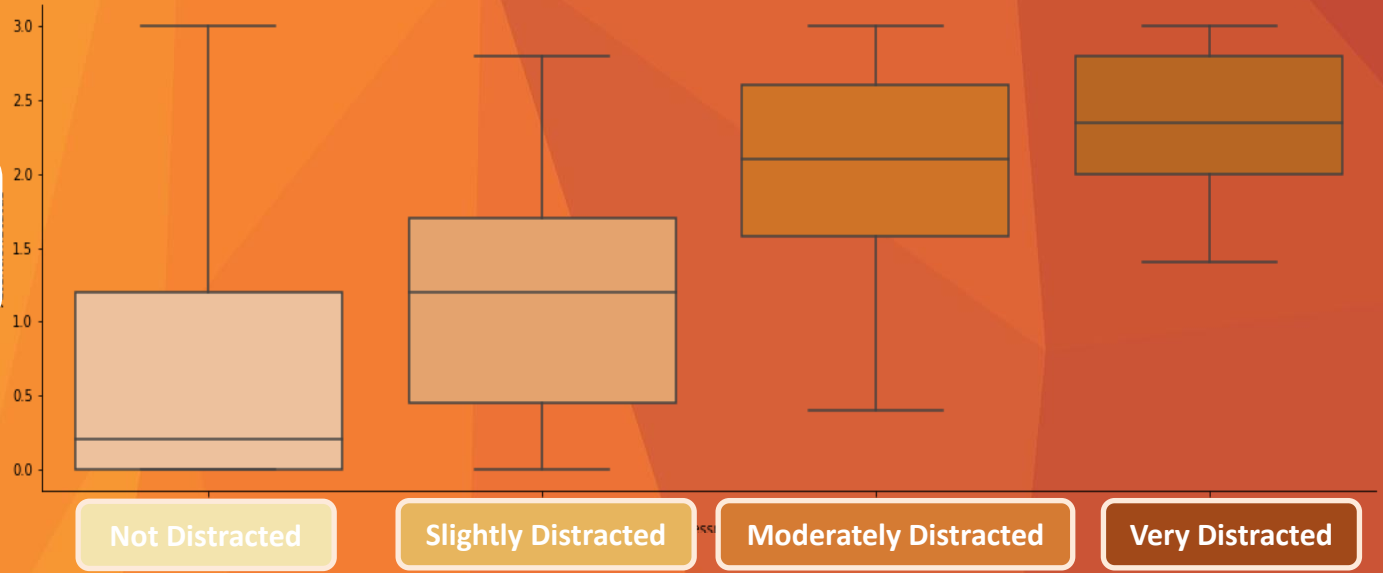
At each timepoint, values were calculated within the algorithm to output the suspected attention level of the driver.





The attention status was compared to the ground truth, which was determined during data reduction.

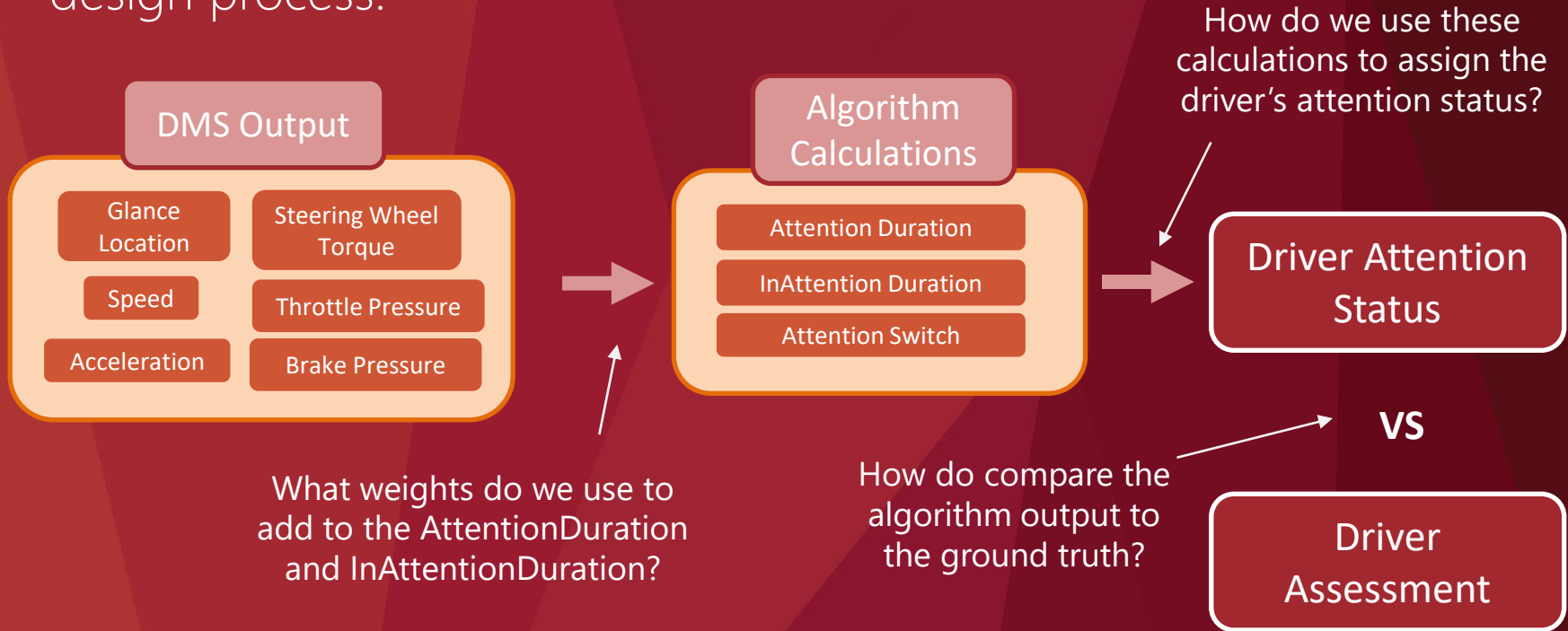
Algorithm Output:
Driver Attention
Status



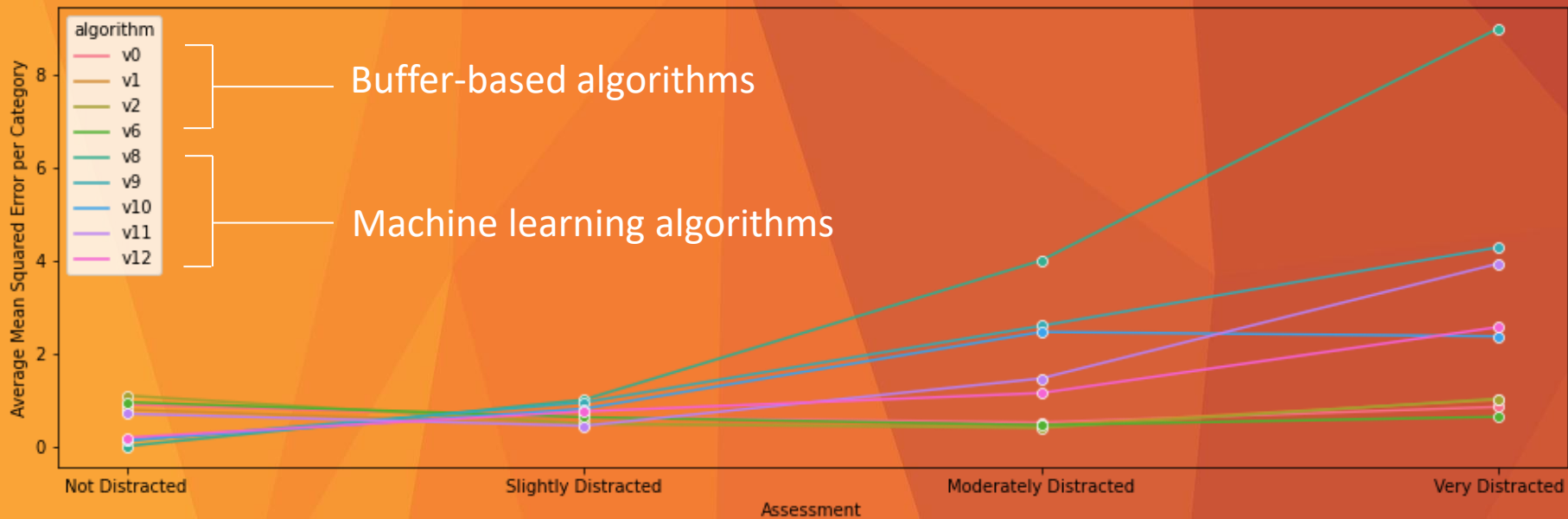
The attention status was compared to the ground truth, which was determined by the data collection.

- 1) Calculate error
- 2) Minimize error
- 3) Prioritize the correct bin

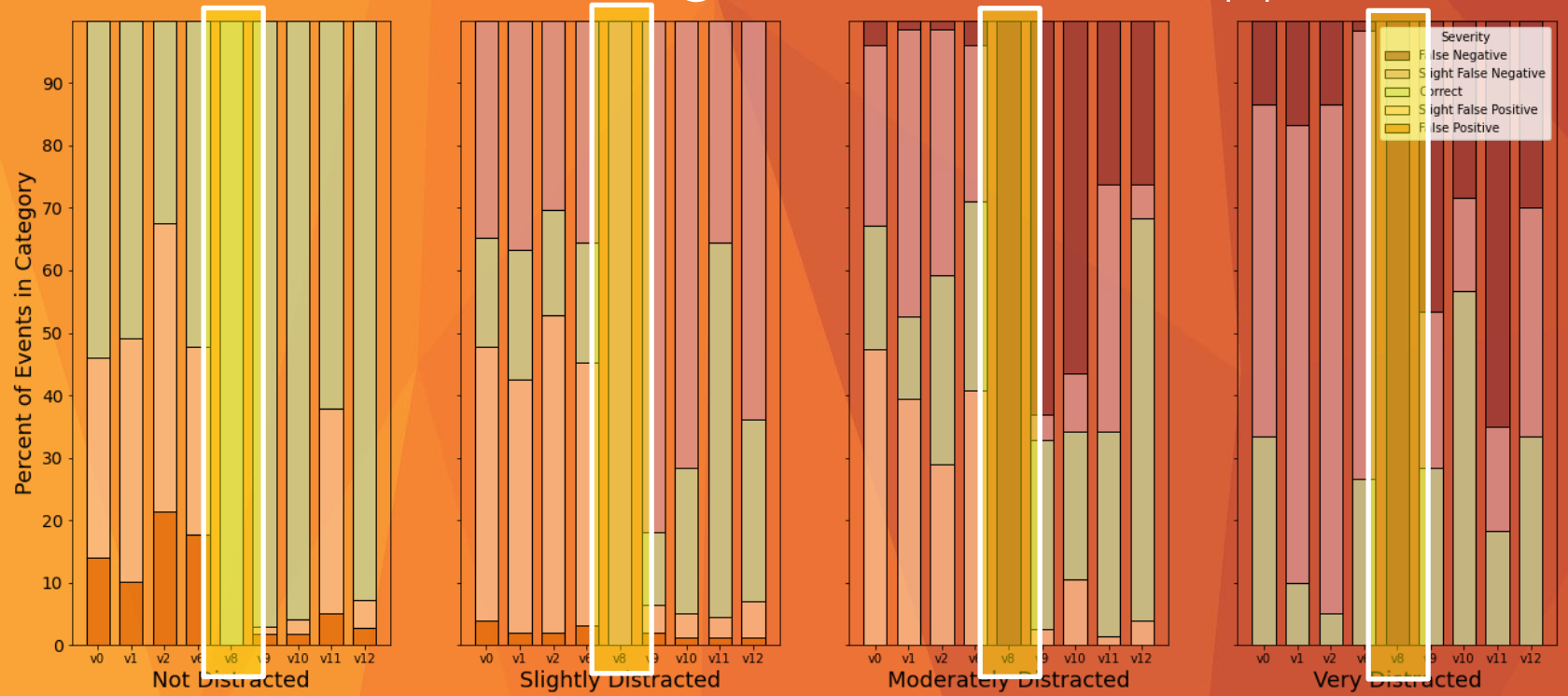
Adjustments can be made along different parts of the algorithm design process.



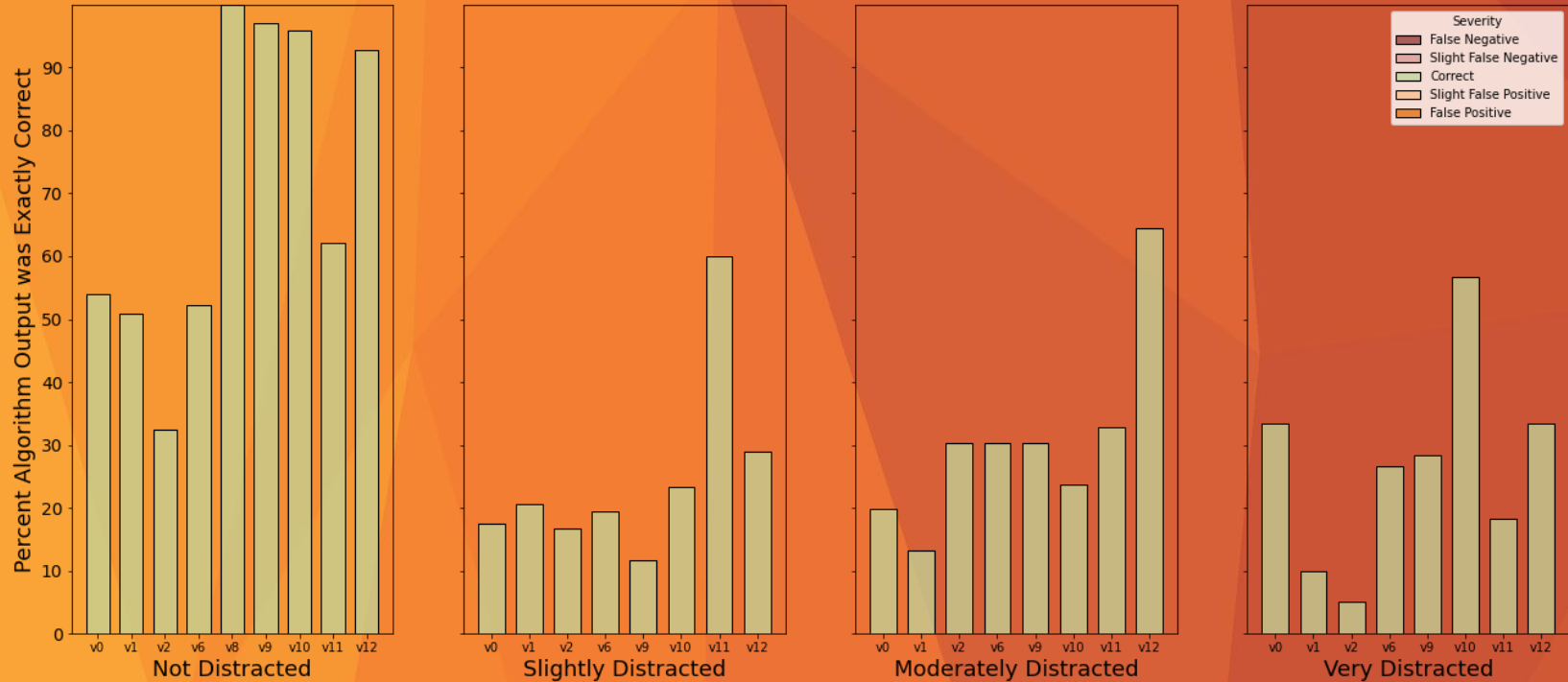
We can compare algorithms against one another to determine the correct algorithm for each application.



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In Summary,

- Tools available now make it easier to determine when a driver is inattentive
- Algorithms used to determine driver attention should be designed with an understanding of their limitations and could be used as a guideline for further development
- At a minimum, both glance location and speed should be used to assess driver attention
- DMS could be an important component in reducing distractions



Thank you!

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