Jonathan Pilling

Reverse Outline

Introduction

1. Gives benefits and background of why we need self-driving cars. Topic sentence kind of unclear.
2. Talks about history of autonomous vehicles. Topic sentence “One of the first autonomous cars were hypothesized in the 1990s.”
3. Autonomous vehicles, why they’re unsafe now. “Autonomous vehicles as they are now are insufficient for human ...”
4. Presenting methods to solve relative velocity issues. Topic Sentence “The methods are presented to help solve the issues of calculating relative velocity.”
5. Little more detail into methods the paper will talk about. Topic sentence unclear.
6. Talk about methods suffering. Topic sentence “Although these solutions have assisted tremendously...”

All paragraphs in this section are about the same length. All mid-sized paragraphs.

Methods

1. Overview of Methods I’ll be discussing. Topic sentence “There are a lot of current methodologies to make autonomous vehicles as safe as possible.”
2. Talk about Wang TTC experiments. Topic sentence “Wang. et al used a camera coordinate system to implement their TTC algorithm.”

3. Talk about Java application for Wang TTC experiments. “In [2] Wang and his team of authors were able to implement the TTC algorithm in Java.”
4. Overview into next TTC experiment using Matlab. Topic sentence unclear.
5. Matlab experiments overview. “The authors implemented the algorithm and used MATLAB to plot results.”
6. Contrasting of the TTC algorithms. “The biggest contrast between these two TTC algorithms presented is that one requires object detection and one does not.”
7. Talk about final experiments using learning based framework. “The final experiments we will discuss for calculating relative velocity is to use a learning-based framework from human drivers. ”
8. Talk about predictive controller and statistic models. “Lefevre et al. were able to use a predictive controller which enforces sets of comfort and safety constraints.”
9. Talk about training phases in experiments. Topic sentence unclear.
10. Talk about controller and how it changes relative velocity. “The controller was used to ensure safety constraints.”
11. Talk about collected data from human drivers. “The authors collected data from five human drivers.”
12. Comparing and contrasting the different methods. “The methodologies behind all these experiments were all very different.”

Most paragraphs that talk about methods are all the same length. The setup and transition paragraphs are a little shorter.

Results

1. Talk about how results are all different. Topic sentence kind of unclear.

2. Talk about TTC android results. “In [2], the car with the Android phone running the TTC algorithm was able to accurately determine dangerous and safe conditions.”
3. Talk about algebra of TTC. “Using the inverse of the TTC in calculation, the authors were able to calculate relative velocity by multiplying distance by inverse of the estimated TTC.”
4. Discussion of Matlab results. “In [3], Horn et al. used three different experiments to test their TTC algorithm.”
5. Discussion of framework results. “In [4], when the personalized model of the first driver was used, the authors created a situation that the model did not know how to handle.”
6. Discussion of framework downsides. “The behavior of this system shows that it can handle all kinds of different situations.”

Paragraphs 1, 2, and 3 are shorter than 4, 5, and 6.

Conclusion

1. Overview of results. Topic sentence unclear.
2. Discussion of how no method is better over the other. “We cannot explain what the best method for determining relative velocity is in autonomous vehicles.”
3. Discussion of what the future could hold if we solve all the relative velocity issues. “If we successfully figure out all the safety concerns of self-driving cars we will have long road trips through the night where we may not have to be behind the wheel.”

All paragraphs equal length.

Analysis

I think the topics are mostly in a logical ordering. I need to add a paragraph in between 3 and 4 in Introduction. This paragraph needs to explain the issues with calculating relative velocity now. I also need to add a paragraph after the results, in the Matlab TTC section talking about the downsides of the TTC. I do this for my other two results discussion, so I think this would help. I think I've included most things essential. I need to add a paragraph at the end of the learning based framework experiments (end of paragraph 11) that talks about how they used radar to calculate relative velocity. This will help give more information to discuss for the discussion section. I think the ordering makes sense except for paragraphs at the end of the methods where I start talking about the next method to be discussed needs to be moved in the subsequent section. For example, at the end of Section A, I have a paragraph that starts to setup section B, I need to move this paragraph into section b.

I think time is spent correctly on each topic. There are some paragraphs I think I could combine and omit. In the methods section, the paragraph that talks about comparing/contrasting TTC algorithms could be moved to the discussion section. The 1st paragraph in the results section could probably be omitted. This paragraph doesn't add anything. The first two paragraphs in the conclusion can be omitted, they don't really add anything. Add 3 paragraphs at the end of the results section for more in-depth discussion.

Revised Outline

1. Gives benefits and background of of autonomous vehicles. Explains what AVs are. "Autonomous cars are cars with the ability to drive themselves."

2. Talks about history of autonomous vehicles. Topic sentence “One of the first autonomous cars were hypothesized in the 1990s.”
3. Autonomous vehicles, why they’re unsafe now. “Autonomous vehicles as they are now are insufficient for human”
4. Discussion of why relative velocity isn’t calculated well now. “In the current methods of calculating relative velocity, there are some apparent issues.”
5. Presenting methods to solve relative velocity issues. Topic Sentence “The methods are presented to help solve the issues of calculating relative velocity.”
6. Little more detail into methods the paper will talk about. “Some methods are presented to help solve the issues with calculating relative velocity.”
7. Talk about methods suffering. Topic sentence “For example, Wang et al. assisted in the programming and deployment of an android phone camera on a robot-controlled car.”
8. Talks about prominent issues in autonomous vehicles. Topic sentence is “There are a lot of different methodologies in current research to help make autonomous vehicles as safe as possible.”
9. Signposting into methods. “However, although these solutions have assisted tremendously, none of them are perfect.”
10. Highlight the methods that will be talked about. New Topic Sentence: “The three experiments I’d like to talk about are the TTC Java experiment, the TTC Matlab experiment, and the learning based framework experiments.”
11. Discussion of Camera coordinate system used in TTC experiments. Topic Sentence : “Wang et al used a camera coordinate system to help implement the TTC algorithm.”
12. Talked about TTC being implemented in Java. “In [2], Wang and his authors were able to implement the TTC algorithm in Java.”

13. Highlight the brightness derivatives methodology. “Horn et al. had another idea for calculating TTC using accumulated sums of suitable products of image brightness derivatives.”
14. Talk about Matlab calculations/simulation. “The authors implemented this TTC calculation and used MATLAB to plot results and estimates.”
15. Highlights final methods “The final experiments we will discuss for calculating relative velocity is to use a learning-based framework from human drivers.”
16. Overview of learning-based framework experiments. “Lefevre et al. were able to use a predictive controller which enforces sets of comfort and safety constraints.”
17. Overview of how accelerations are computed. “Using the Gaussian Regression, the model was able to compute the current acceleration of the car.”
18. Overview of how controller worked with experiments. “The controller was used to ensure safety constraints.”
19. Summary of experiment. “The authors collected driving data from five human drivers.”
20. Summarizing all methodologies. “The methodologies behind all these experiments were all very different.”
21. TTC can detect dangerous and safe conditions. “In [2], the car with the Android phone running the TTC algorithm was able to accurately determine dangerous and safe conditions.”
22. Issues for TTC calculation. “One issue with these calculated TTC values was when the camera would vibrate during the recording process.”
23. Talk about TTC matlab results. “In [3], Horn et al. used three different experiments to test their TTC algorithm.”
24. Talk about TTC matlab issues. “Some issues in these experiments were as follows.”

25. Overview of learning based framework experiments. “In [4] the authors tested their experiments with a set of driver-training models.”
26. Summary and explanation of downsides to the learning based experiments. “The behavior of this system shows that it can handle all kinds of different situations.”
27. Revisit previous sections. “In summary, there’s a lot of different experiments that we’ve looked over.”
28. Compare and contrast the different results. “Each of these methods for calculating relative velocity has positives and negatives.”
29. Summary significance/implication. “Combining sensors will be the way to make autonomous vehicles safer.”
30. Talks about what future could entail if we solve issues. “If we successfully figure out all the safety concerns of self-=driving cars we will have long road trips through the night where we may not have to be behind the wheel.”