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3660s 101 WG Specific Ex. #2 - Hypothetical

BACKGROUND

Vehicle collisions can occur quickly and often do not leave enough time for either driver to react to avoid an accident. When multiple vehicles are in close vicinity, safe evasion of a collision for all vehicles can be complicated. Currently, many vehicles are equipped with sensors that alert a driver when another vehicle is in close proximity. Some vehicle control systems will utilize these sensors to control an automatic braking system. While this action may prevent the sensor-based braking vehicle from colliding with another vehicle, this type of reactive braking could lead to hard braking events creating dangerous situations for surrounding drivers who must react to the braking vehicle. Current control systems only take into account vehicles in close proximity to a host vehicle and effect a change in only the host vehicle's operation without considering what control instructions the surrounding vehicles may be given by their own control systems. A control method that can determine a future point where a plurality of vehicles might collide and provides a collective evasion route plan to enable collaborative corrective action is needed.

The present invention uses a vehicle control system, which includes a controller, a display console, and a GPS. The GPS continually updates the location, directional heading, and vehicle speed of a driver's vehicle during a trip every 0.5 seconds as the vehicle proceeds to its destination. The GPS has a distinct identification number assigned to it so that a remote server can uniquely identify each vehicle having the disclosed GPS. The GPS reports the driver's coordinates, directional heading, and speed information back to the remote server for use in determining if a collision event may occur. Other vehicles on the road having the same GPS with their own unique identification number participate in the same process by sending their location, directional heading, and speed information back to the remote server for collection.

The remote server will search for any vehicles carrying the disclosed GPS having a distinct identification number and will determine instances where at least two vehicles are operating within a 500-foot radius of each other. If two or more vehicles are travelling within 500 feet of each other, the server will take the collected directional information, speed information, and destination information of each vehicle within the 500-foot radius, and determine whether the vehicles are travelling in respective directions which may intersect at some point. Once the at least two vehicles are identified as operating within 500 feet of each other, the server will calculate each of the at least two vehicles' current path information (change in directional heading and change in speed)-every 0.5 seconds until the vehicles are outside of a 500 foot radius of each other. The server then calculates the predicted paths for each vehicle. The predicted path is limited to the 500 foot radius of another vehicle since this is a distance where collision avoidance becomes critical. The predicted paths may be temporarily stored in the remote server. The server then formulates a collective evasion route plan using the predicted paths of each vehicle. The collective evasion route plan is a set of commands for each vehicle to implement to avoid a potential collision. It can include various commands including a braking force command that provides the amount of braking force that needs to be exerted by one or more of the vehicles' brakes, a steering angle command that provides a change in the wheel angle of one or more of the vehicles, and a steering torque command that provides the amount of torque that needs to be applied to the wheel of one or more of the vehicles. The collective evasion route plan is formulated by the remote server and

transmitted to each vehicle so that the vehicles are simultaneously instructed to change course and/or vehicle speed in a safe, proactive manner which is collaborative between the at least two vehicles to avoid a collision event. This way, the at least two vehicles share the same collision avoidance plan thereby increasing the likelihood of collision avoidance since the vehicles do not rely solely upon their own typical onboard detection systems which do not formulate a collaborative plan with other vehicles. For the duration of time that the vehicles continue to be within 500 feet of each other, the predicted paths are constantly reevaluated to determine an updated, dynamic collective evasion route plan.

Claims

1. A method comprising:

- identifying a first, second, and third vehicle;
- determining, by a first GPS, a first directional heading of the first vehicle;
- determining, by a second GPS, a second directional heading of the second vehicle;
- determining, by a third GPS, a third directional heading of the third vehicle; and
- comparing the first, second, and third directional headings to evaluate whether a collision event may occur.

2. A method comprising:

- determining, by a remote server, a first predicted path of a first vehicle located within 500 feet of a second and third vehicle;
- determining, by the remote server, a second predicted path of the second vehicle;
- determining, by the remote server, a third predicted path of the third vehicle; and
- temporarily storing the first, second, and third predicted paths in the remote server.

3. A method comprising:

- determining, by a remote server, a first predicted path of a first vehicle located within 500 feet of a second and third vehicle;
- determining, by the remote server, a second predicted path of the second vehicle;
- determining, by the remote server, a third predicted path of the third vehicle; and
- continuously evaluating the first, second, and third predicted paths to formulate a dynamic collective evasion route plan for the vehicles based on the first, second, and third predicted paths to avoid collision amongst the first, second, and third vehicles with one another.

ANALYSIS

Claim 1

Step 1: Statutory Category?	Yes. The claim is a method including at least one step.
Step 2A—Prong 1: Judicial Exception Recited?	<p>Yes. The claim recites the limitations of identifying a first, second, and third vehicle; determining the directional heading of the three vehicles and comparing the first, second, and third directional headings to evaluate whether a collision event may occur. The determining limitations, as drafted, are processes that, under their broadest reasonable interpretation, cover performance of the limitation in the mind but for the recitation of “by a GPS”. That is, other than reciting “by a GPS” nothing in the claim element precludes the step from practically being performed in the mind. For example, but for the “by a GPS” language, the claim encompasses a user standing on a street or viewing a screen and determining the direction a vehicle is heading. The mere nominal recitation of a GPS does not take the claim limitations out of the mental process grouping.</p> <p>Additionally, the identifying and comparing steps, under the broadest reasonable interpretation, cover a process that is practically performed in the human mind. For example, these limitations cover a user standing on the street, identifying three vehicles in their mind and determining if any two of the three vehicles may collide based on each vehicle’s directional heading.</p> <p>Thus, each of the limitations in the claim recite a mental process.</p>
Step 2A—Prong 2: Practical Application?	No. The claim recites the additional element of “by a GPS” that performs the determining step. The determining by a GPS is recited at a high level of generality and merely automates the determining steps, therefore acting as a generic computer to perform the abstract idea. The GPS is claimed generically and is operating in its ordinary capacity and does not use the judicial exception in a manner that imposes a meaningful

	limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the exception. The additional limitation is no more than mere instructions to apply the exception using a computer (the GPS).
Step 2B: Inventive Concept?	No. As discussed with respect to Step 2A Prong Two, the additional elements in the claim amount to no more than mere instructions to apply the exception using a computer. The same analysis applies here in 2B, i.e., mere instructions to apply an exception on a computer cannot integrate a judicial exception into a practical application at Step 2A or provide an inventive concept in Step 2B. The claim is ineligible .

Claim 2

Step 1: Statutory Category?	Yes. The claim is a method including at least one step.
Step 2A—Prong 1: Judicial Exception Recited?	<p>No. The claim does not recite any of the judicial exceptions enumerated in the 2019 PEG. For instance, the claim does not recite a mental process because the claim, under its broadest reasonable interpretation, does not cover an abstract idea that can reasonably be performed in the human mind. In the autonomous vehicle technology, a “predicted path” has an ordinary and customary meaning to one of ordinary skill in the art as the predicted trajectory along which the vehicle is predicted to travel over time taking into account numerous different inputs such as: known destination, real-time road and traffic conditions, merge lanes, traffic signals, speed limits, and location of objects near the vehicle. Given that, determining a predicted path for the three vehicles is not something that is practically performed in the human mind.</p> <p>The human mind cannot practically determine the predicted paths of three vehicles located within 500 feet of each other. Since the human</p>

	<p>mind cannot practically foresee the predicted paths of vehicles, the limitations of “determining predicted paths” of other vehicles do not fall within the mental step grouping. Further the claim does not recite any method of organizing human activity, such as a fundamental economic practice or managing interactions between people. Finally, while the claimed determinations may have underlying mathematical computations, the claim does not recite any mathematical relationship, formula or calculation.</p> <p>The storing step of the claim does not fall into one of the enumerated groupings of abstract ideas.</p> <p>Thus, the claim is eligible because it does not recite a judicial exception.</p>
Step 2A—Prong 2: Practical Application?	N/A.
Step 2B: Inventive Concept?	N/A

Claim 3

Step 1: Statutory Category?	Yes. The claim is a method including at least one step.
Step 2A—Prong 1: Judicial Exception Recited?	No. The claim does not recite any of the judicial exceptions enumerated in the 2019 PEG. As with claim 2 above, the claim does not recite a mental process because the claim, under its broadest reasonable interpretation, does not cover an abstract idea that can reasonably be performed in the human mind. In the autonomous vehicle technology, a “predicted path” has an ordinary and customary meaning to one of ordinary skill in the art as the predicted trajectory along which the vehicle is predicted to travel over time taking into account numerous different inputs such as: known destination, real-time road and traffic conditions, merge lanes, traffic signals, speed limits, and location of objects near the vehicle. Given that, determining a predicted path for the

	<p>three vehicles is not something that is practically performed in the human mind.</p> <p>The human mind cannot practically determine the predicted paths of three vehicles located within 500 feet of each other. Since the human mind cannot practically foresee the predicted paths of vehicles, the limitations of “determining predicted paths” of other vehicles do not fall within the mental step grouping. Additionally, the claim recites the limitation of continuously formulating a dynamic collective evasion route plan for all of the vehicles which is a computationally complex determination which the human mind is not equipped to practically perform. For example, it requires knowledge of all of the vehicles’ respective coordinates, changes in directional headings, changes in speed, traffic delays, stop signs, etc. Further the claim does not recite any method of organizing human activity, such as a fundamental economic practice or managing interactions between people. Finally, while the claimed determinations may have underlying mathematical computations, the claim does not recite any mathematical relationship, formula or calculation. Thus, the claim is eligible because it does not recite a judicial exception.</p>
Step 2A—Prong 2: Practical Application?	<p>N/A.</p> <p>Although the analysis is complete at Prong 1, claim 3 contrasts with claim 2 in that it is <i>additionally</i> eligible because the last limitation would integrate any claimed abstract idea (if there was one) into a practical application as an improvement in collision avoidance technology. The formulation of a collective evasion route based on the determined first, second, and third predictive paths provides a specific technological solution to the problem of collision avoidance among multiple vehicles within close proximity of each other. <i>See, e.g., TecSec, Inc. v. Adobe Inc.</i>, No. 2019-2192, -2258, 2020 WL 6228460, at *12-13 (Fed. Cir. Oct. 23, 2020).</p>

	<p>Thus, this claim would be eligible even if there was a judicial exception recited in the claim.</p> <p>Note that a claim need only be found eligible at any one of Prong 1, Prong 2, or Step 2B in order to be considered eligible over all.</p>
Step 2B: Inventive Concept?	N/A.