IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

PERCEPTIVE AUTOMATA LLC,	§	
	§	
Plaintiff,	§	
	§	**JURY TRIAL DEMANDED**
v.	§	
	§	
TESLA, INC.,	§	**C.A. NO. 2:25-cv-742**
	§	
Defendant.	§	
	§	

PLAINTIFF'S COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Perceptive Automata LLC ("Perceptive" or "Plaintiff") files this Complaint against Defendant Tesla, Inc. ("Tesla" or "Defendant") for infringement of U.S. Patent No. 10,614,344 (the "'344 patent"), U.S. Patent No. 11,126,889 (the "'889 patent"), U.S. Patent No. 11,467,579 (the "'579 patent"), U.S. Patent No. 11,520,346 (the "'346 patent"), and 11,753,046 (the "'046 patent"), collectively, the "Asserted Patents."

THE PARTIES

1. Perceptive Automata LLC is a Texas limited liability company.

2. On information and belief, Tesla, Inc. is a corporation organized and existing under the laws of the State of Texas, having a principal place of business as its global headquarters at 1 Tesla Road, Austin, Texas 78725.

3. Tesla has numerous business locations throughout Texas, including businesses within this District located at 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075.

4. The Tesla business locations within this District are vital to Tesla's presence and business in the state of Texas. *See, e.g.*, https://dentonrc.com/news/denton_county/flower-mound-greenlights-tesla-location-the-automaker-s-first-for-denton-county/article_41b4f605-86c8-53d6-8ae8-ea409f0f8b87.html ("Expanding and having this new center in Flower Mound is going to be vital to our presence in the state of Texas," Tesla design manager Dhwani Dave told the council members.").

5. Tesla's past and continuing making, using, selling, offering for sale, and/or importing, and/or inducing its subsidiaries, affiliates, retail partners, and customers in the making, using, selling, offering for sale, and/or importing the accused instrumentalities throughout the United States i) willfully infringe each of the Asserted Patents and ii) impermissibly take the significant benefits of Perceptive's patented technologies without fair compensation to Perceptive.

6. Tesla is engaged in making, using, selling, offering for sale, and/or importing, and/or induces its subsidiaries, affiliates, retail partners, and customers in the making, using, selling, offering for sale, and/or importing throughout the United States, including within this District, products and services accused of infringement.

JURISDICTION AND VENUE

7. This action arises under the patent laws of the United States, namely 35 U.S.C. §§ 271, 281, and 284-285, among others.

8. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over Tesla in accordance with due process and/or the Texas Long Arm Statute because, among other things, Tesla does business in this State by, among other things, maintaining offices in this District, including maintaining its offices

located at 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075.

10. Further, this Court has personal jurisdiction over Tesla because it has engaged, and continues to engage, in continuous, systematic, and substantial activities within this State, including the substantial marketing, making, using, and sale of products and services within this State and this District. Indeed, this Court has personal jurisdiction over Tesla because it has committed acts giving rise to Perceptive's claims for patent infringement within and directed to this District, has derived substantial revenue from its goods and services provided to individuals in this State and this District, and maintains regular and established places of business in this District, including its places of business at 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075.

11. Relative to patent infringement, Tesla has committed and continues to commit acts in violation of 35 U.S.C. § 271, and has made, used, marketed, distributed, offered for sale, imported, and/or sold infringing products and services in this State, including in this District, and otherwise engaged in infringing conduct within and directed at, or from, this District. Such products and services have been and continue to be offered for sale, distributed to, sold, and used in this District, and the infringing conduct has caused, and continues to cause, injury to Perceptive, including injury suffered within this District. These are purposeful acts and transactions in this State and this District such that Tesla reasonably should know and expect that it could be haled into this Court because of such activities.

12. In addition, Tesla has knowingly induced and continues to knowingly induce infringement within this District by advertising, marketing, offering for sale and/or selling devices pre-loaded with infringing functionality within this District, to consumers, customers, manufacturers, distributors, resellers, partners, and/or end users, and providing instructions, user manuals, advertising, and/or marketing materials which facilitate, direct or encourage the use of infringing functionality with knowledge thereof.

13. Tesla re-incorporated from Delaware to Texas in 2024. In preparation for its Shareholder decision to re-incorporate in Texas, Tesla provided the following statements:

- "The Texas legal framework is strong and fair, and more appropriate to our mission;"
- "Our global headquarters, largest manufacturing facility and future are in Texas;"
- "We have thousands of [Texas] employees;" and
- "We respect Texas. Texas respects us."

https://ir.tesla.com/_flysystem/s3/sec/000110465924057076/tm2326076d23_defa14a-gen.pdf at 3. Moreover, Telsa considers Texas its "home." *Id.* at 47 (stating "Bring Tesla Home to Texas.").

14. Venue is proper in this District under 28 U.S.C. §§ 1391 and 1400(b) because Tesla has regular and established places of business in this District and has committed acts of infringement in this District. Tesla's regular and established places of business in this District include, at least, its facilities in 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075. Such acts of infringement include the making, using, and/or selling of Tesla vehicles with Full Self-Driving (FSD) hardware and/or software that leverage and infringe the inventions of the Asserted Patents (as more

particularly identified and described throughout this Complaint, below) in this State and this District.

15. Tesla's "Gigafactory" and "Global Headquarters" are located in Austin, Texas. https://www.tesla.com/giga-texas. This factory has "over 10 million square feet of factory floor" and is a "manufacturing hub for Model Y and the home of Cybertruck." *Id*. The Model Y and the Cybertruck comprise the FSD hardware and/or software, and these autonomous vehicle models are Accused Products.

16. Tesla has built Cortex 1 ("Cortex") and is building Cortex 2 at its Gigafactory in Austin, Texas. Cortex is an infringing product and/or service that includes a supercluster datacenter that receives video clips from Tesla's large fleet of vehicles that Cortex uses to train Tesla's FSD product/service.

17. On information and belief, Tesla has a large number of employees in Texas working on the self-driving technology infringed by the Asserted Patents. For example, Tesla has an autonomous robotaxi service, which uses Tesla's FSD infringing technology, operating in Austin, Texas. https://www.shop4tesla.com/en/blogs/news/tesla-robotaxi-fsd-tests-austin-2025.

18. Tesla is currently advertising job positions in Texas related to the infringing products and services. *See, e.g.*, https://www.tesla.com/careers/search/job/staff-soc-rtl-design-engineer-self-driving-244821; https://www.tesla.com/careers/search/job/machine-learning-hardware-performance-engineer-self-driving-244822; https://www.tesla.com/careers/search/job/physical-design-engineer-self-driving-245760; https://www.tesla.com/careers/search/job/sr-product-test-engineer-self-driving-244818.

19. As further discussed, the Asserted Patents do not claim autonomous driving generally, but rather, are directed to concrete solutions for problems faced by autonomous vehicles,

such as how to predict the variable behavior and decision-making of humans. Training autonomous vehicle systems with a better understanding of such issues improves self-driving capabilities of vehicles and increases safety for drivers, pedestrians, and other vehicles.

COUNT I

(INFRINGEMENT OF U.S. PATENT NO. 10,614,344)

20. Plaintiff incorporates paragraphs 1 through 19 herein by reference.

21. Perceptive is the assignee of the ’344 patent, entitled “System and Method of Predicting Human Interaction with Vehicles,” with ownership of all substantial rights in the ’344 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

22. The ’344 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The ’344 patent issued from U.S. Patent Application No. 16/512,560.

23. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claim 1[1] of the ’344 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing FSD software and hardware, Tesla vehicles with FSD software and hardware, and/or systems that support Tesla vehicles with FSD software and hardware (the ’344 Accused Products). Such infringement includes, but is not limited to, the making, using, and/or selling of ’344 Accused Products that leverage and infringe the inventions of the ’344 patent.

[1] Throughout this Complaint, wherever Plaintiff identifies specific claims of the Asserted Patents infringed by Defendant, Plaintiff expressly reserves the right to identify additional claims and products in its infringement contentions in accordance with applicable local rules and the Court’s case management order. Specifically identified claims throughout this Complaint are provided for notice pleading only.

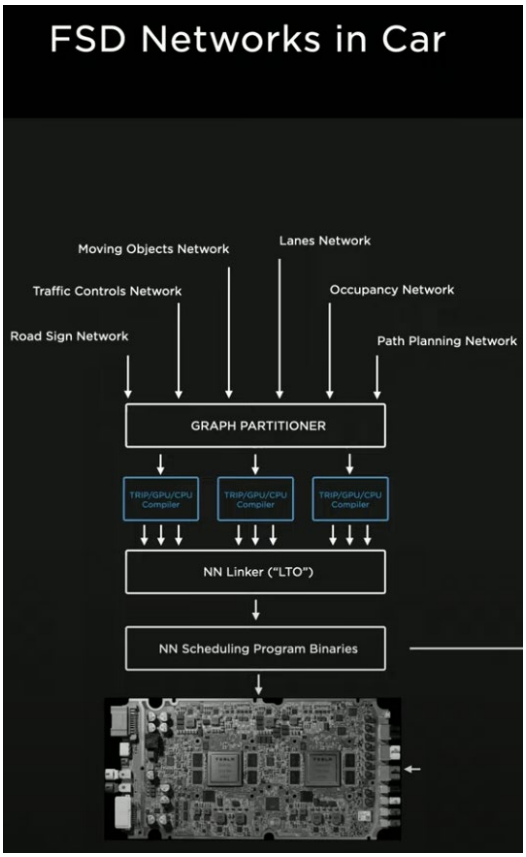
24. On information and belief, Tesla directs and controls the ’344 Accused Products to operate in an infringing manner by providing the FSD hardware and software instructions that infringe the ’344 patent. Furthermore, Tesla installs, services, and/or maintains the ’344 Accused Products that it provided to its customers. Tesla owns and controls the FSD software which automatically runs on and controls the ’344 Accused Products. Through its provision of FSD software, Tesla causes the ’344 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps by the ’344 Accused Products by conditioning receipt of warranty benefits on the customer’s agreement not to modify the ’344 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

25. On information and belief, Tesla performs a computer-implemented method that receives, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road. For example, the ’344 Accused Products include an internal computing device. This is evidenced by historic statements from Tesla’s website referring to an “onboard computer”:

Processing Power Increased 40x

To make sense of all of this information, our Hardware 3 onboard computer processes more than 40 times the data compared to our previous generation system. This computer runs the Tesla-developed neural net, which is the foundation for how we train and develop Autopilot. This system provides a view of the world that a driver alone cannot access, seeing in every direction simultaneously, and on wavelengths that go far beyond the human senses.

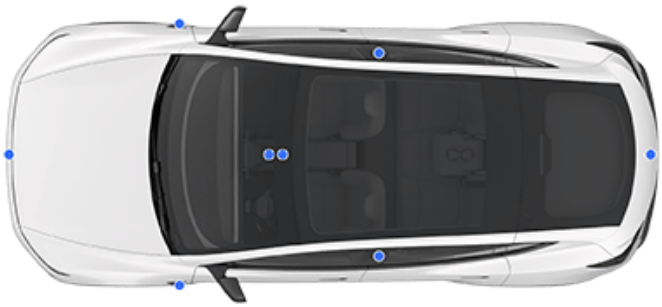
https://www.tesla.com/autopilot (as of January 1, 2025). And also evidenced by graphics shown in videos produced by Tesla:



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The onboard computer is associated with its host, which is an autonomous vehicle that operates on the road. *See* https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery"). The '344 Accused Products comprise sensors, such as cameras, that actively monitor road conditions.

Cameras

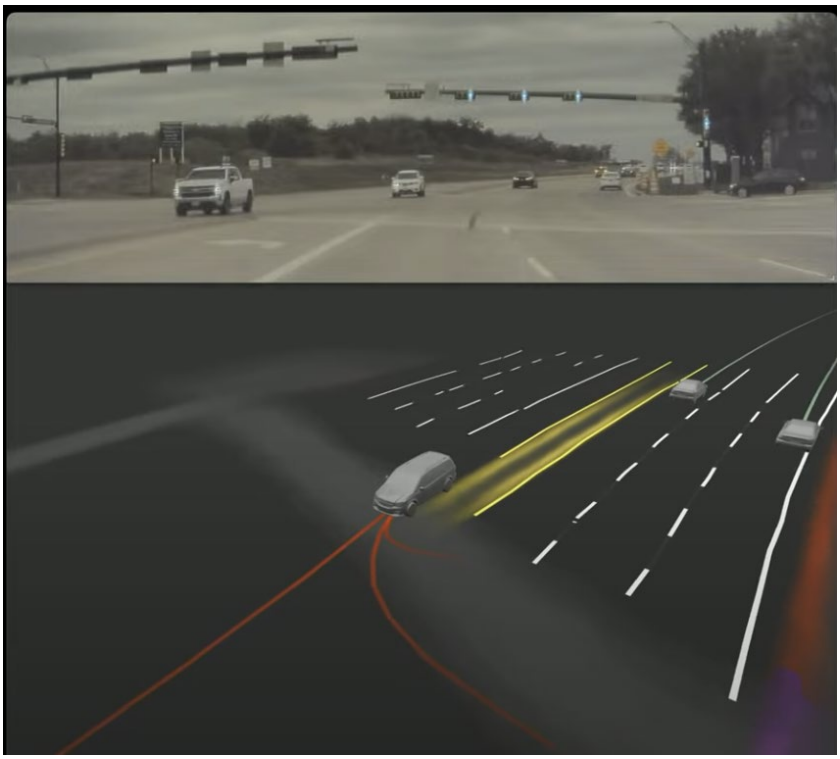
Your Model Y includes the following components that actively monitor the surrounding area:



- A camera is mounted above the grille on the front bumper.
- A camera is mounted above the rear license plate.
- A camera is mounted in each door pillar.
- Two cameras are mounted to the windshield above the rear view mirror.
- A camera is mounted to each front fender.

Model Y is also equipped with high precision electronically-assisted braking and steering systems.

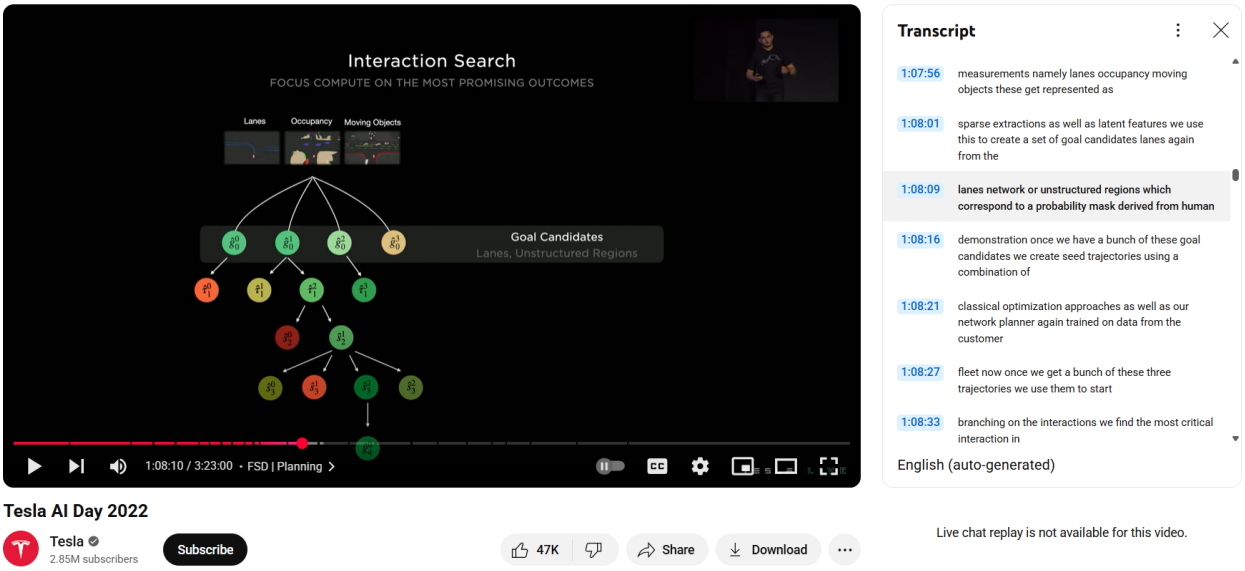
https://www.tesla.com/ownersmanual/modely/en_us/GUID-682FF4A7-D083-4C95-925A-5EE3752F4865.html. The onboard computer, receives sensor data captured by the sensors that displays an object on the road:



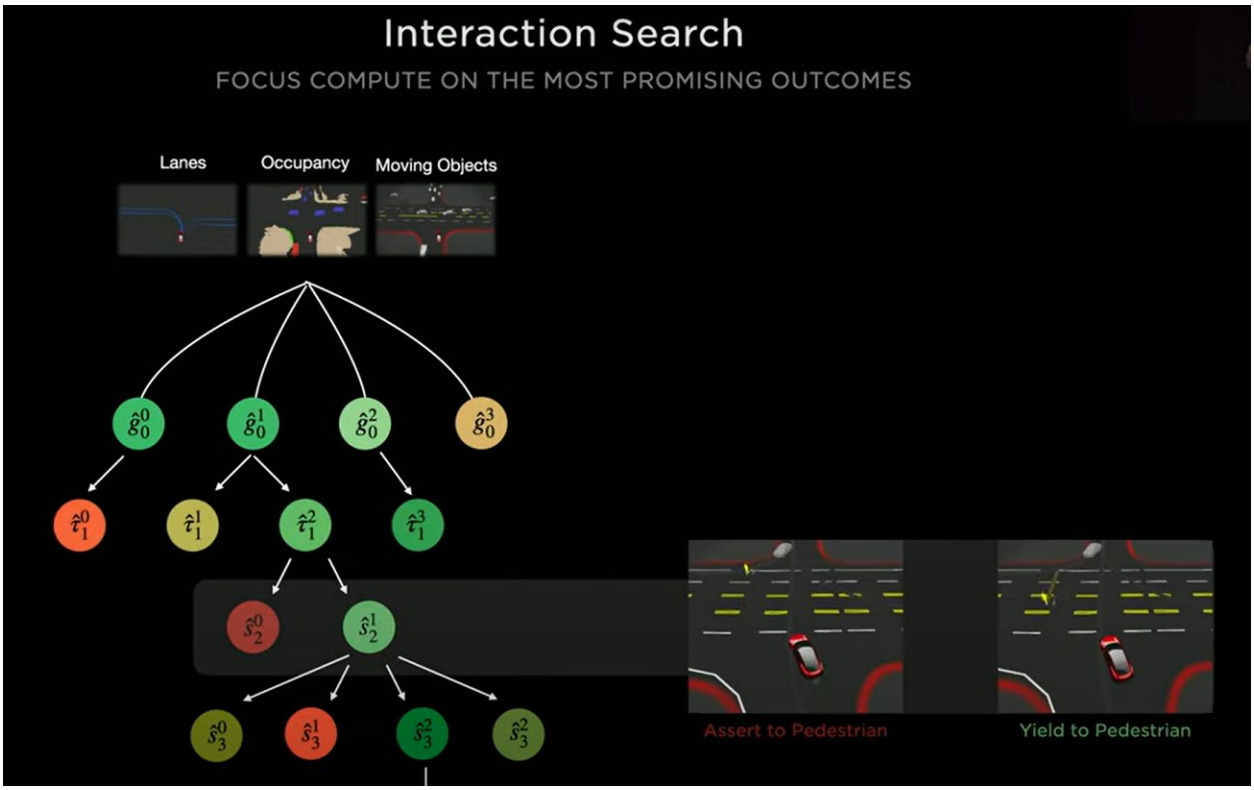
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

26. On information and belief, Tesla provides the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object. The onboard computer within the ’344 Accused Products includes the FSD software, which comprises a supervised learning based model. The FSD software is based on supervised learning. For example, Tesla’s in-house team of over 1,000 people (e.g., users) provided advanced labeling to particular objects (e.g., vehicle stopped at light in left hand lane) in a traffic scene. In the example illustrated below, a labeler is asked whether a stationary vehicle is one of six options: stopped_double_parked, stopped_traffic_controls, stopped_idle_in_lane, stopped_pulled_over, stopped_traffic, or parked.

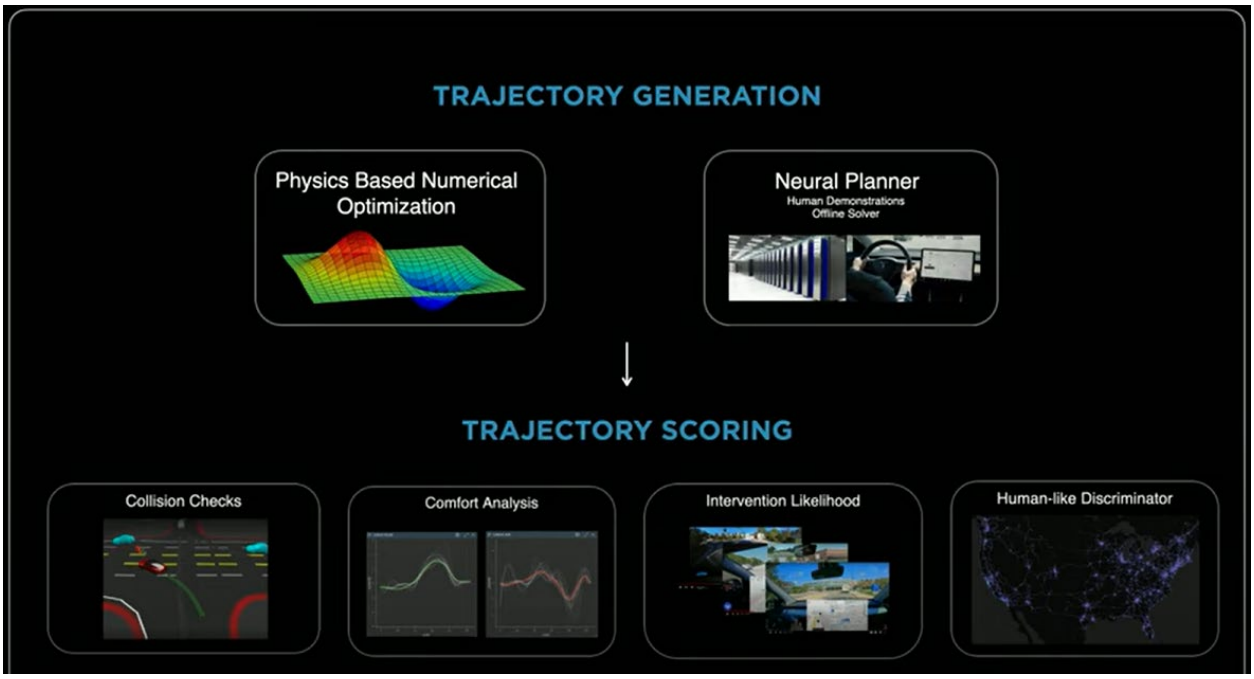
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The FSD software is configured to receive the sensor data as an input. In response to the sensor data, the FSD software predicts a statistical summary that characterizes a distribution of user responses expected to be received if presented with the sensor data. This is evidenced by the decision tree for the FSD software. In the below example, the FSD software is presented with sensor data corresponding to an object in the road and creates a set of "goal candidates" that "correspond to a probability mask derived from human demonstration."



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The FSD software is also presented with further sensor data corresponding to an object in the road. For example, in the below excerpt, the FSD software is presented with sensor data corresponding to a pedestrian in the road:



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). In response to this sensor data, the FSD software predicts a distribution of user responses expected to be received responsive to presenting the pedestrian in the road to a plurality of users. This is evidenced by the FSD software's assessment of the "Intervention Likelihood," as well as the "Human-like Discriminator" that the FSD software relies on. And further evidenced by the fact the Neural Planner within the FSD software was built on "Human Demonstrations":

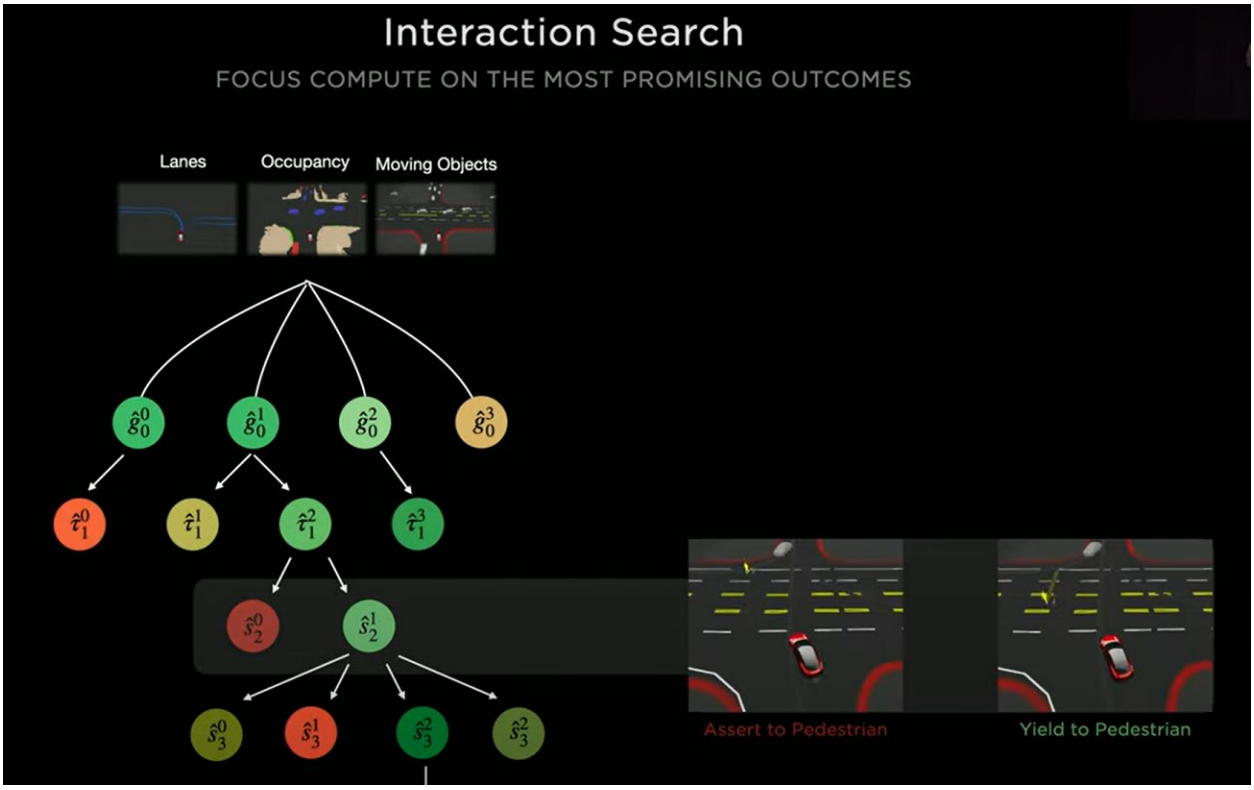


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

27. On information and belief, Tesla executes the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users. For example, the '344 Accused Products execute the FSD software (the trained supervised learning based model) to generate a summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users. *See* https://www.cnbc.com/2023/09/09/ai-for-cars-walter-isaacson-biography-of-elon-musk-excerpt.html (quoting a member of Tesla's autopilot team as saying "Instead of determining the proper path of the car based on rules, we determine the car's proper path by relying on a neural network that learns from millions of examples of what humans have done."); *see also id.* (explaining "In other words, it's human imitation. Faced with a situation, the neural network chooses a path based on what humans have done in thousands of similar situations."). As detailed

above, the statistical summary generated by the FSD software is evidenced by the assessment of the "Intervention Likelihood," as well as the "Human-like Discriminator" that the FSD software relies on.

28. On information and belief, Tesla controls the operation of the autonomous vehicle on the road based on the generated statistical summary data. The FSD software uses the generated statistical summary data to determine actions. For example, in the below excerpt, the FSD software relies on the statistical summary to determine whether to Assert or Yield to the pedestrian:



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

29. The specific ways in which the '344 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the '344 Accused Products.

30. The technology discussion above and the exemplary ’344 Accused Products provide context for Plaintiff’s infringement allegations.

31. The claims of the ’344 patent are patent eligible under 35 U.S.C. § 101. The ’344 patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. The claims of the ’344 patent are directed to specific technological advancements of autonomous vehicles for predicting the behavior of objects near the autonomous vehicle in a way that more closely resembles how human drivers would predict their behavior. ’344 Patent at 3:44-45. The specification of the ’344 patent explains that properly predicting the behavior of moving objects around the autonomous vehicle is necessary for safely controlling an autonomous vehicle to avoid hitting other objects or people. *Id.* at 1:21-31. Conventional methods for autonomous vehicles control, however, do not predict a moving object’s actions or movements based on other observations besides the object’s past movements, which lead to inferior results in predicting the object’s future behavior. *Id*. at 1:30-50. For example, the conventional methods for controlling an autonomous vehicle could not reliably anticipate whether a person walking on a sidewalk will cross the street, whether another person will remain standing on a street corner, and whether another person will change lanes on his or her bicycle. *Id*. at 1:21-31. The ’344 patent provides several technical features that embody a technical solution to the problems of conventional methods. For example, the technological process of claim 1 of the ’344 patent receives data displaying an object on the road that is provided to a supervised learning based model that is configured to predict an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the object on the road to a plurality of users. *Id*. at 15:26-38. The supervised learning based model of claim 1 is then executed to generate a

statistical summary data characterizing a distribution of user responses (*e.g.*, user predictions for how the object will behave) expected to be received responsive to particular objects on the road. *Id*. at 7:32-39 ("The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles … that operate on roadways by allowing them to make judgments about the future behavior of road users based on their state of mind."); 15:39-44. The technological process of claim 1 then controls the operation of the autonomous vehicle on the road based on the generated statistical summary data. *Id.* at 15:45-47. Accordingly, claim 1 of the '344 patent provides detailed technical requirements for how an improved technological process creates the improved result for controlling the operation of an autonomous vehicle. *Id*. at 13:9-20 ("These summary statistics are an estimate of what the summary statistics would be for a collection of human observers who were shown [the object on the road]. The estimates summary statistics are therefore the system's best answer to the question 'does this cyclist intend to enter the path of the vehicle.' The vehicle is therefore able to make a guess 1006 about the intention of the cyclist that is closely matched to the guess that a human driver would make in that same situation."). The claims of the '344 patent are directed at specific asserted improvements in computer functionalities, specifically to autonomous vehicles, and not directed to abstract ideas. Further, as shown above, the ordered combination of the various claim elements of the claims of the '344 patent results in an unconventional manner result that is highly beneficial to autonomous vehicles—e.g., operation of an autonomous vehicle that more accurately predicts the behavior of pedestrians, bicycles, and other vehicles. The claims of the '344 patent encompass a "technology-based solution" to a problem that is unique to the operations of autonomous vehicles and are therefore patent eligible.

32. At a minimum, Tesla has known about the ’344 patent and its infringement of the ’344 patent at least as early as the filing date of the Complaint. Further, on information and belief, Tesla’s conduct before the USPTO provides that Tesla was aware of the ’344 patent and its infringement prior to the filing of the Complaint. For example, in prosecuting U.S. Patent No. 11,403,069, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,409,692, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,487,288, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,537,811, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,561,791, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,562,231, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,567,514, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,610,117, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,636,333, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,665,108, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,681,649, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,734,562, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,748,620, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,790,664, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,816,585, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,841,434, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,893,774, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,893,393, Tesla has known of the ’344 patent. In another example, in prosecuting

U.S. Patent No. 12,014,553, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 12,307,350, Tesla has known of the ’344 patent. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of this Complaint.

33. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla has actively induced, under U.S.C. § 271(b), its distributors, customers, testing outfits, subsidiaries, importers, and/or consumers to directly infringe one or more claims of the ’344 patent by using and/or testing the ’344 Accused Products. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’344 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the ’344 Accused Products, creating and/or maintaining established distribution channels for the ’344 Accused Products into and within the United States, manufacturing the ’344 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the ’344 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

34. On information and belief, despite having knowledge of the ’344 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the ’344 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high

likelihood of infringement. Tesla's infringing activities relative to the '344 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

35. Perceptive has been damaged as a result of Tesla's infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT II

(INFRINGEMENT OF U.S. PATENT NO. 11,126,889)

36. Plaintiff incorporates paragraphs 1 through 35 herein by reference.

37. Perceptive is the assignee of the '889 patent, entitled "Machine Learning Based Prediction of Human Interactions with Autonomous Vehicles," with ownership of all substantial rights in the '889 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

38. The '889 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The '889 patent issued from U.S. Patent Application No. 16/828,823.

39. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claim 2 of the '889 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing systems that support Tesla vehicles with FSD software and hardware (the '889 Accused Products). Such infringement includes, but is not limited to, the making, using,

and/or selling of ’889 Accused Products that leverage and infringe the inventions of the ’889 patent.

40. On information and belief, Tesla directs and controls the ’889 Accused Products to operate in an infringing manner by providing the FSD hardware and software instructions that infringe the ’889 patent. Furthermore, Tesla installs, services, and/or maintains the ’889 Accused Products that it provided to its customers. Tesla owns and controls the FSD software which automatically runs on and controls the ’889 Accused Products. Through its provision of the FSD software, Tesla causes the ’889 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the ’889 Accused Products by conditioning receipt of warranty benefits on the customer’s agreement not to modify the ’889 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

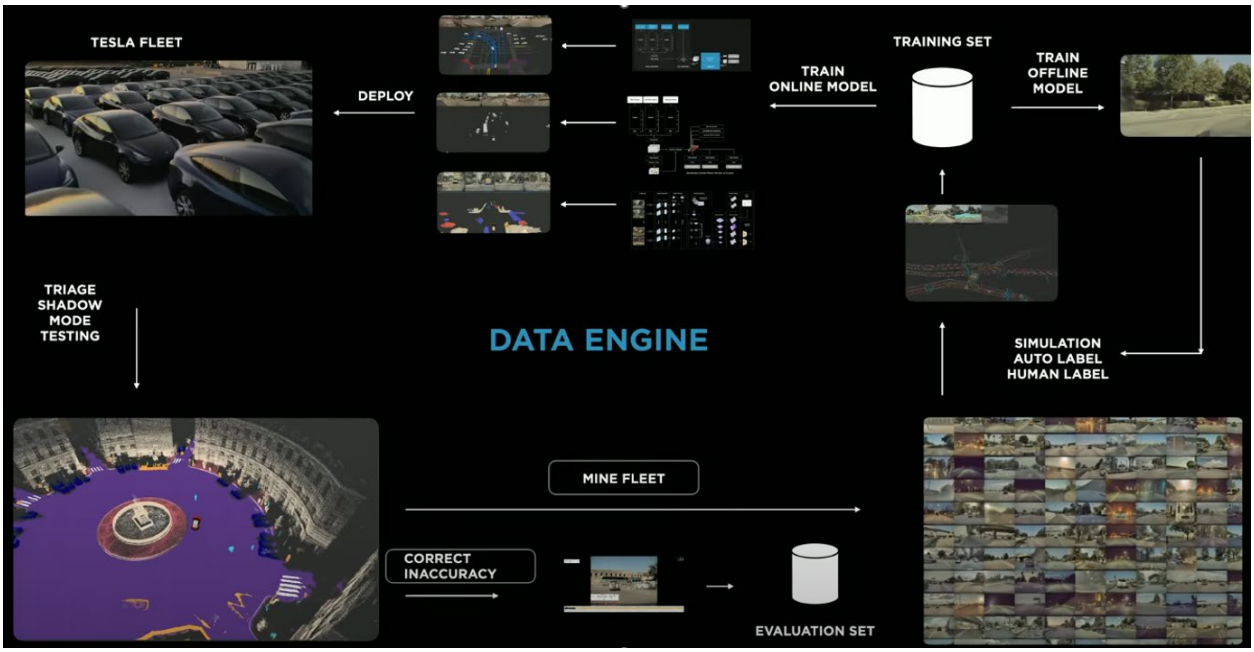
41. On information and belief, Tesla performs a computer-implemented method for controlling an autonomous vehicle based on a predicted state of mind of road users in a scene captured by a camera of the autonomous vehicle as described in the steps below. The ’889 Accused Products comprise a computer that provides autonomous operation:

Processing Power Increased 40x

To make sense of all of this information, our Hardware 3 onboard computer processes more than 40 times the data compared to our previous generation system. This computer runs the Tesla-developed neural net, which is the foundation for how we train and develop Autopilot. This system provides a view of the world that a driver alone cannot access, seeing in every direction simultaneously, and on wavelengths that go far beyond the human senses.

https://www.tesla.com/autopilot (as of January 1, 2025); See https://www.tesla.com/fsd (“Watch the World’s First Autonomous Car Delivery”).

42. On information and belief, Tesla receives a plurality of images displaying road scenes captured by one or more vehicles. For example, Tesla receives, at one or more of its datacenters (e.g., Dojo, Cortex), a plurality of images displaying road scenes captured by one or more Tesla vehicles.

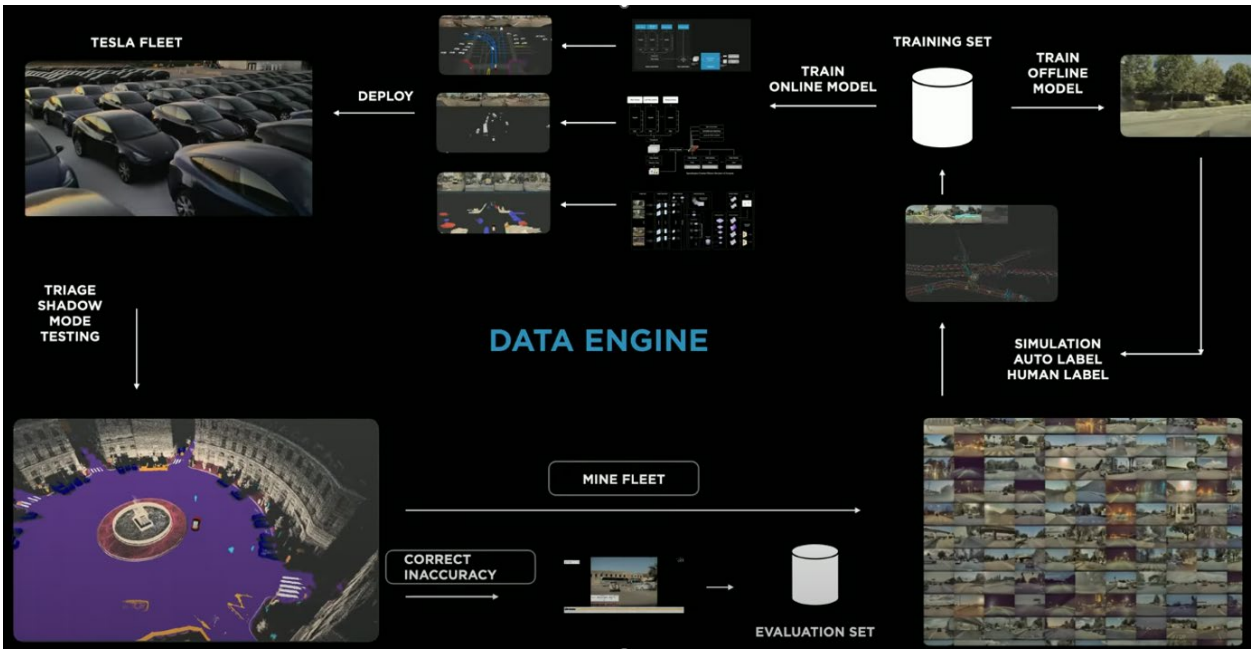


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). Similarly, the '889 Accused Products are part of the Tesla fleet. *See* https://www.tesla.com/fleet. The Tesla fleet transmits the sensor data to Tesla's servers. *See* https://electrek.co/2020/10/24/tesla-collecting-insane-amount-data-full-self-driving-test-fleet/ ("Tesla asked owners for the authorization to collect videos from the Autopilot cameras. After that, Tesla opened the floodgates of Autopilot data gathering."); https://electrek.co/2017/05/06/tesla-data-sharing-policy-collecting-video-self-driving/ (quoting Tesla as saying "We are working hard to improve autonomous safety features and make self-driving a reality for you as soon as possible. In order to do so, we need to collect short video clips using the car's external cameras to learn how to recognize things like lane lines, street signs, and traffic light positions. The more fleet learning of road conditions we are able to do, the better your Tesla's self-driving ability will become.").

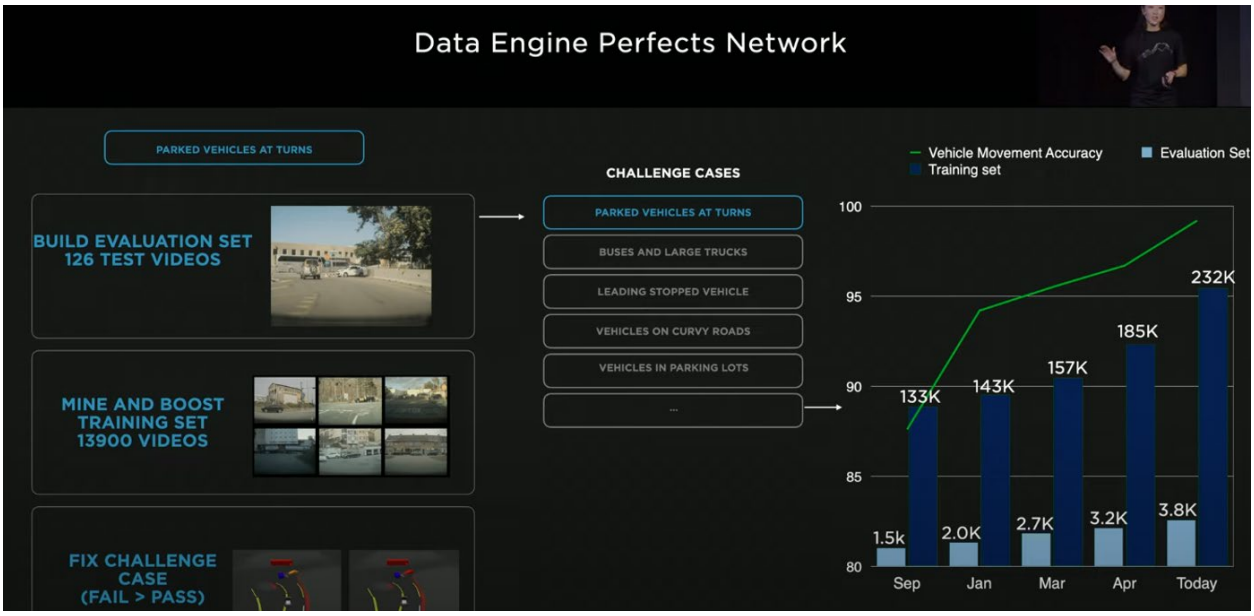
43. On information and belief, Tesla receives a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images. For example, Tesla receives, at one or more of its datacenters (e.g., Dojo, Cortex), the user responses to plurality of images. This is evidenced by the fact that Tesla received millions of video clips "collected from the cars of Tesla customers." *See* https://www.cnbc.com/2023/09/09/ai-for-cars-walter-isaacson-biography-of-elon-musk-excerpt.html. These clips convey the state of mind of road users, which is evidenced by Tesla's selection of scenarios "from humans when they handled a situation well," and corresponded to things "a five-star Uber driver would do." *Id.* Further, the videos received by Tesla at its datacenters were labeled based on the road users state of mind. *Id.* (explaining that "Human labelers, many of them based in Buffalo, New York, assessed the videos" that Tesla received at its datacenters.). Tesla employed an in-house team of over 1,000 data labelers that provide advanced labeling that describes a state of mind of a road user displayed in one or more images. In the example illustrated below, a labeler is asked whether a stationary vehicle is one of six options: stopped_double_parked, stopped_traffic_controls, stopped_idle_in_lane, stopped_pulled_over, stopped_traffic, or parked.

https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The resulting label describes the state of mind of road users displayed in the plurality of images.

44. On information and belief, Tesla generates a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images. At its datacenters (e.g., Dojo and/or Cortex), Tesla generates a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images. With each new user response, the weight of the statistical summary describing the state of minds of road users in the plurality of images is modified, such that the accuracy of the movement by the autonomous vehicle movement improves with more responses and updated statistical summaries.

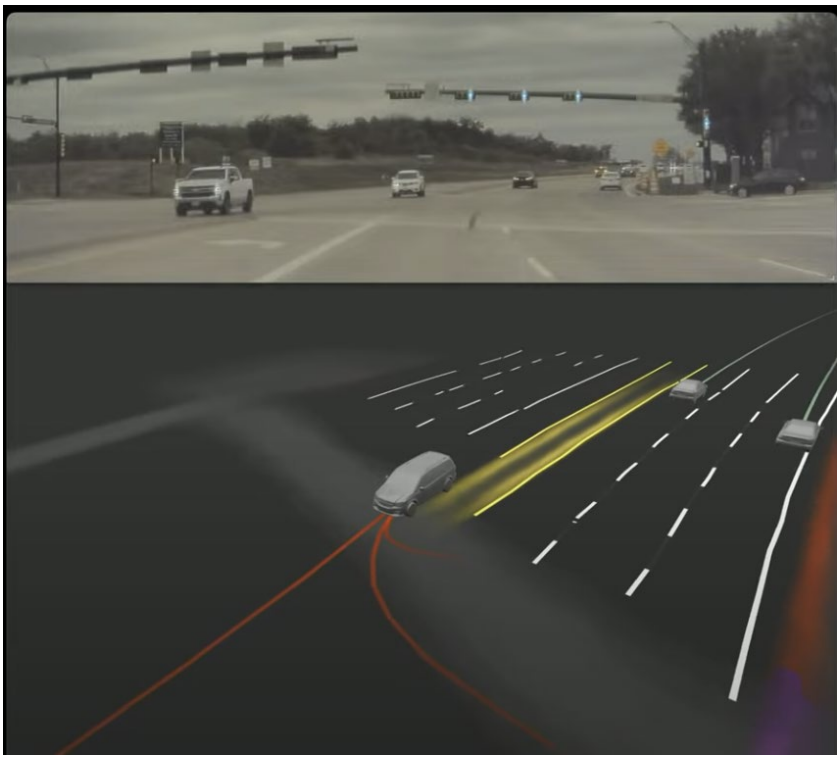


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

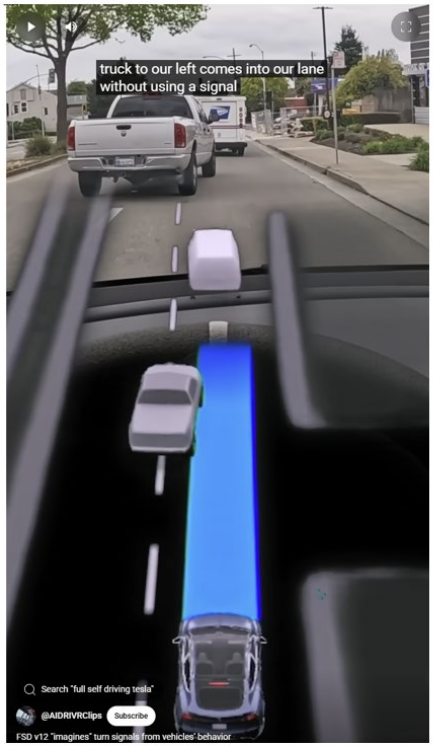


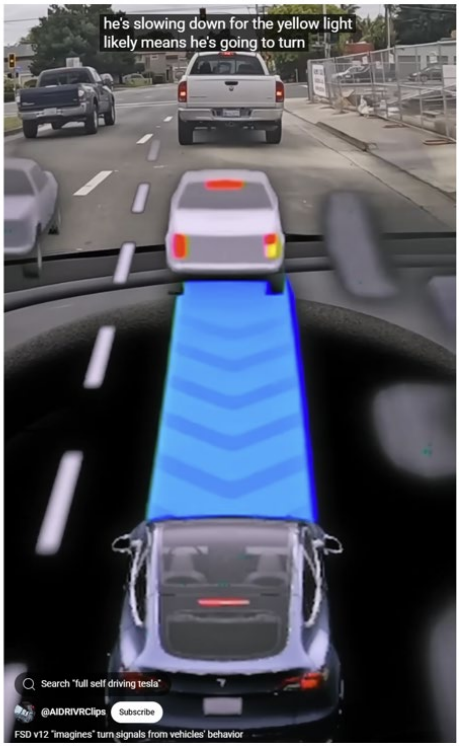
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

45. On information and belief, Tesla trains, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image. Tesla uses the training data set to train the FSD software, which comprises a supervised learning based model. This is evidenced by the fact that the FSD software predicts actions based on the possible state of mind of road users.

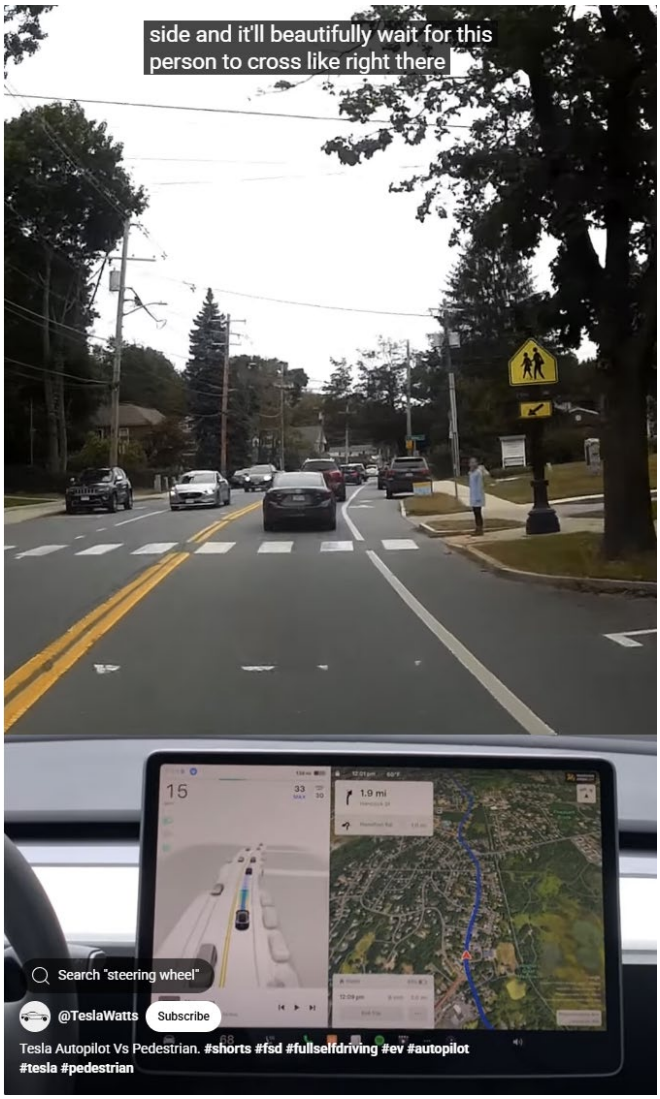


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).





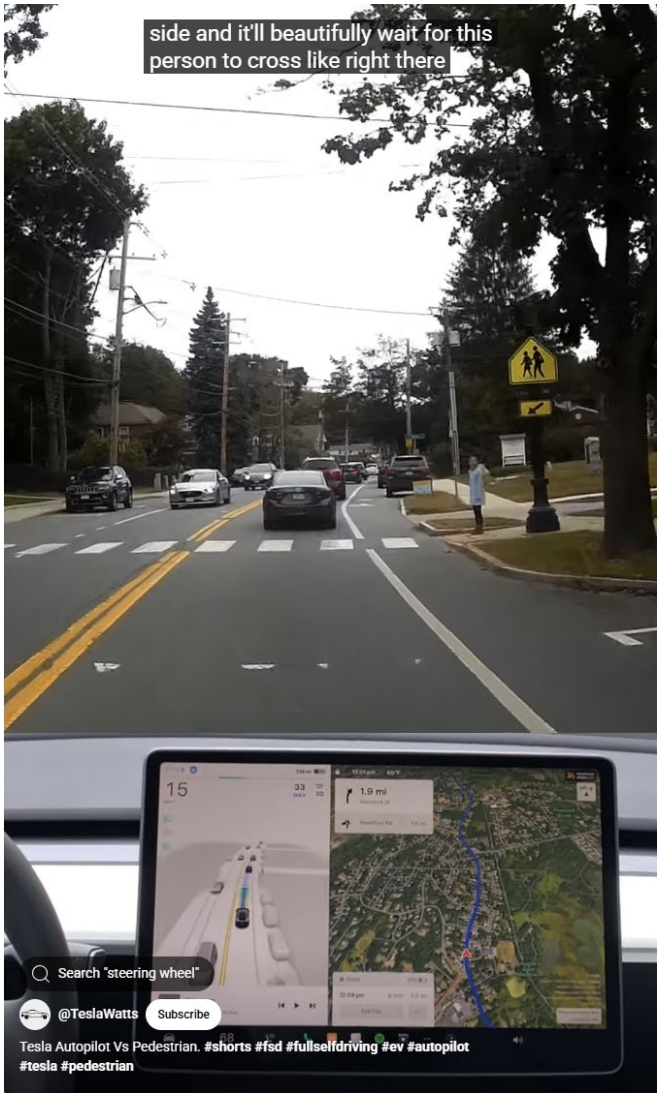
https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand).

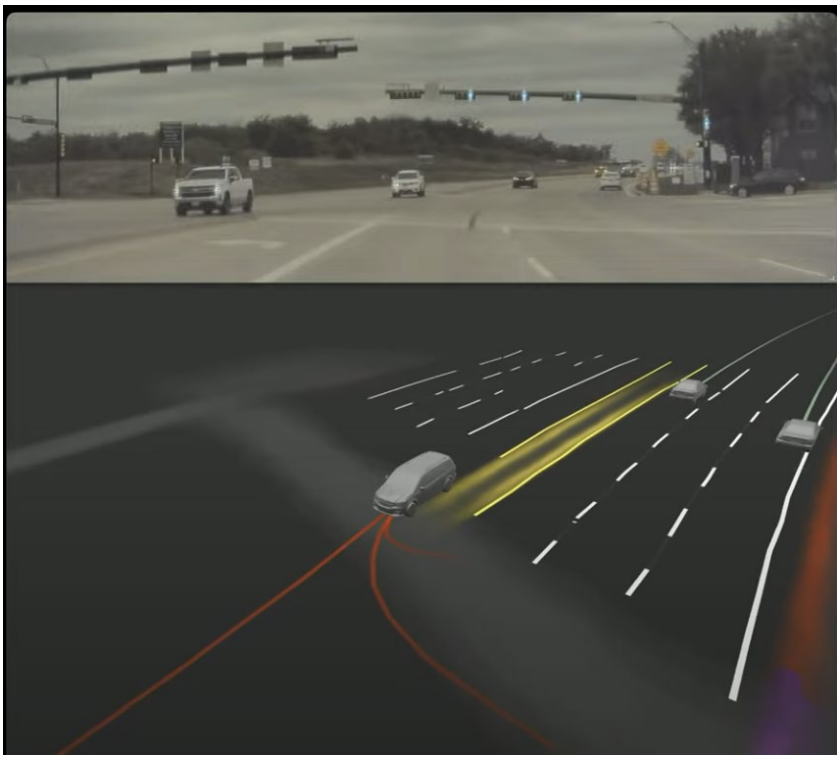
46. On information and belief, Tesla receives, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user.

For example, the ’889 Accused Products receives an image from its camera of a pedestrian on the side of the road.

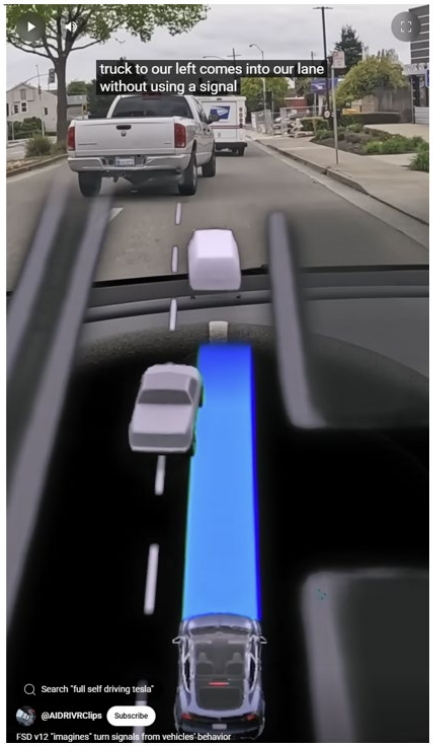


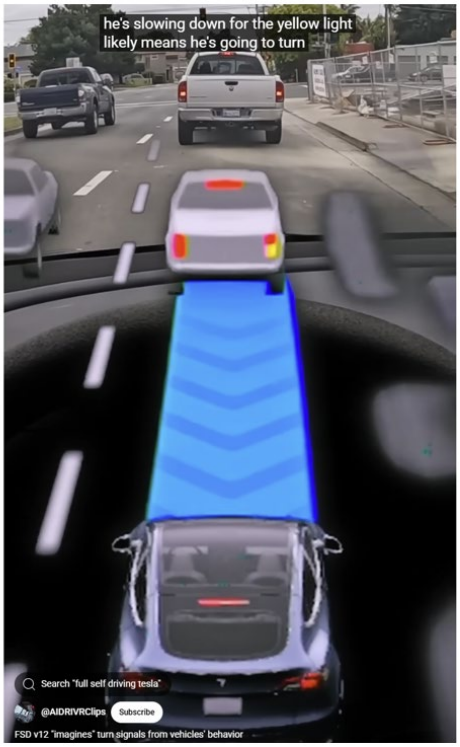
https://www.youtube.com/shorts/-fJzjyi6HkI.

47. On information and belief, Tesla predicts, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image. For example, Tesla, via its FSD software makes statistical predictions describing a state of mind of the road user in the new image. This is evidenced by the fact that the FSD software predicts actions based on the possible state of mind of road users:

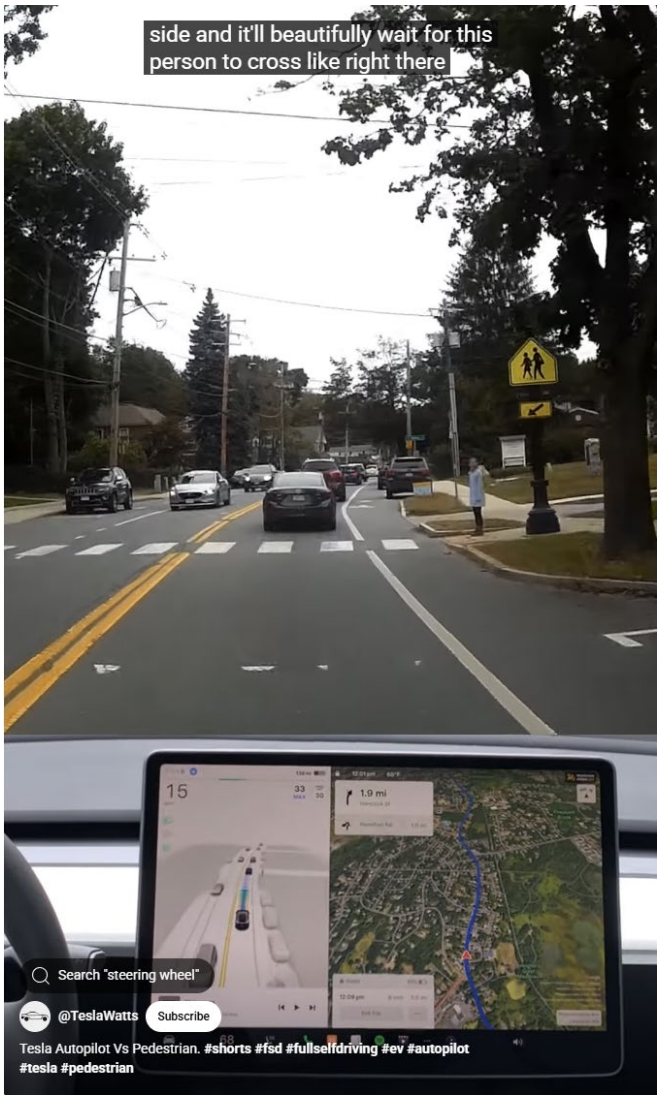


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).





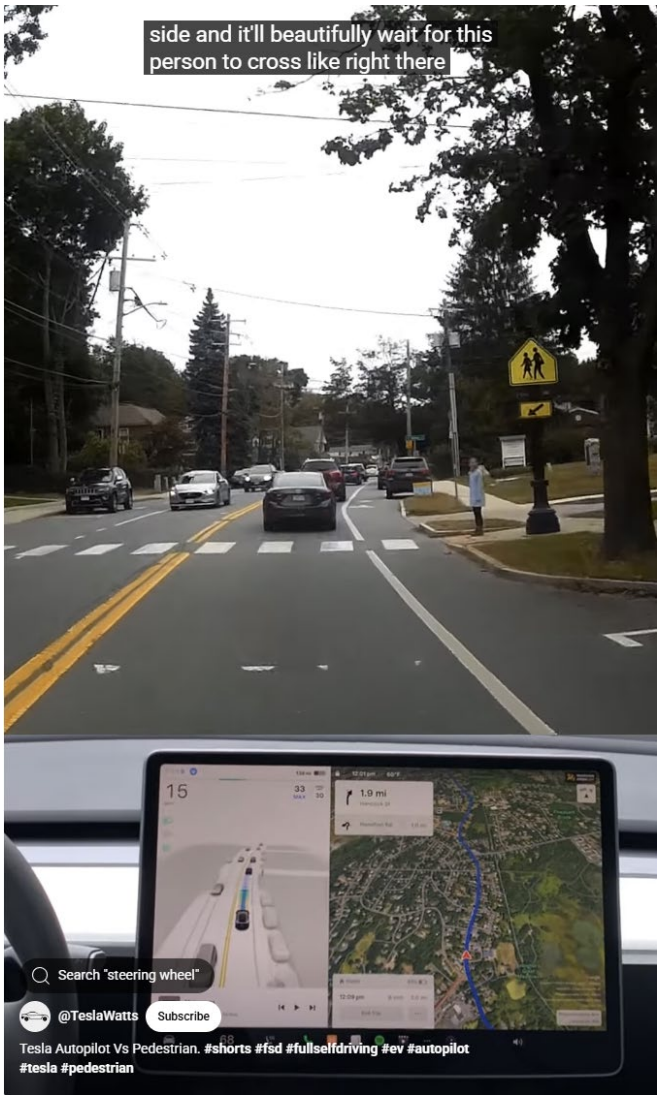
https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to still).

48. On information and belief, Tesla controls the autonomous vehicle based on the prediction of the supervised learning based model. For example, the operation of the Tesla autonomous vehicle is controlled by Tesla's FSD software based on the prediction of the

supervised learning based model. This is evidenced by the fact that the autonomous vehicle performs actions, such as stopping to allow a pedestrian to cross the road without human interaction.



https://www.youtube.com/shorts/-fJzjyi6HkI.

49. The specific ways in which the ’889 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the ’889 Accused Products.

50. The technology discussion above and the exemplary ’889 Accused Products provide context for Plaintiff’s infringement allegations.

51. The claims of the ’889 patent are patent eligible under 35 U.S.C. § 101. The ’889 patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. The claims of the ’889 patent are directed to specific technological advancements for predicting the behavior of road users near the autonomous vehicle in a way that more closely resembles how human drivers would predict their behavior. ’889 patent at 3:51-53. The specification of the ’889 patent explains that properly predicting the behavior of moving objects around the autonomous vehicle is necessary for safely controlling an autonomous vehicle to avoid hitting other objects or people. *Id.* at 1:25-35. Conventional methods for autonomous vehicles control, however, do not predict a moving object’s actions or movements based on other observations besides the object’s past movements, which lead to inferior results in predicting the object’s future behavior. *Id.* at 1:42-54. For example, conventional methods for controlling an autonomous vehicle could not reliably anticipate whether a person walking on a sidewalk will cross the street, whether another person will remain standing on a street corner, and whether another person will change lanes on his or her bicycle. *Id*. at 1:25-35. The ’889 patent provides several technical features that embody a technical solution to the problems of conventional methods. For example, claim 2 of the ’889 recites a technological process that leverages supervised learning based model that is configured to predict summary statistics describing the state of minds of road users in a plurality of received images using training dataset comprising summary statistics of user responses describing the state of minds of road users (*e.g.*, user predictions for how the road user will behave, such as whether the road user will move a certain direction or stay in place). *Id*. at 15:41-59. The autonomous vehicle of claim 2 then uses

the supervised learning based model to predict summary statistics describing a state of mind of the road user in the new image. *Id*. at 13:14-25 ("These summary statistics are an estimate of what the summary statistics would be for a collection of human observers who were shown [the object on the road]. The estimates summary statistics are therefore the system's best answer to the question 'does this cyclist intend to enter the path of the vehicle.' The vehicle is therefore able to make a guess 1006 about the intention of the cyclist that is closely matched to the guess that a human driver would make in that same situation."); 15:41-59. The technological process of claim 2 controls the autonomous vehicle based on the prediction of the supervised learning based model. *Id*. at 7:38-44 ("The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles … that operate on roadways by allowing them to make judgments about the future behavior of road users based on their state of mind."); 15:60-61. Accordingly, claim 2 of the '889 patent provides detailed technical requirements for how an improved technological process creates the improved result for controlling the operation of an autonomous vehicle. *Id.* 13:14-25. The claims of the '889 patent are directed at specific asserted improvements in computer functionalities, specifically to autonomous vehicles, and not directed to abstract ideas. Further, as shown above, the ordered combination of the various claim elements of the claims of the '889 patent results in an unconventional manner result that is highly beneficial to autonomous vehicles—e.g., operation of an autonomous vehicle that more accurately predicts the behavior of pedestrians, bicycles, and other vehicles. The claims of the '889 patent encompass a "technology-based solution" to a problem that is unique to the operations of autonomous vehicles and are therefore patent eligible.

52. At a minimum, Tesla has known about the ’889 patent and its infringement of the ’889 patent at least as early as the filing date of the Complaint. Further, on information and belief, Tesla’s conduct before the USPTO provides that Tesla was aware of the ’889 patent and its infringement prior to the filing of the Complaint. For example, in prosecuting U.S. Patent No. 11,157,441, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,409,692, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 10,671,349, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,893,393, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 12,307,350, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,561,791, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,215,999, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,361,457, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,636,333, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,562,231, Tesla has known of the ’889 patent. In another example, in prosecuting European Patent Application Publication No. 3864573, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,196,678, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,816,585, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,537,811, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,610,117, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 10,997,461, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,150,664, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,567,514, Tesla has known of the ’889 patent. In

another example, in prosecuting U.S. Patent No. 10,956,755, Tesla has known of the ’889 patent. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of this Complaint.

53. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla has actively induced, under U.S.C. § 271(b), its distributors, customers, testing outfits, subsidiaries, importers, and/or consumers to directly infringe one or more claims of the ’889 patent by using and/or testing the ’889 Accused Products. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’889 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the ’889 Accused Products, creating and/or maintaining established distribution channels for the ’889 Accused Products into and within the United States, manufacturing the ’889 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the ’889 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

54. On information and belief, despite having knowledge of the ’889 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the ’889 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla’s infringing activities relative to the ’889 patent have been, and

continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

55. Perceptive has been damaged as a result of Tesla's infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT III

(INFRINGEMENT OF U.S. PATENT NO. 11,467,579)

56. Plaintiff incorporates paragraphs 1 through 55 herein by reference.

57. Perceptive is the assignee of the '579 patent, entitled "Probabilistic Neural Network for Predicting Hidden Context of Traffic Entities for Autonomous Vehicles," with ownership of all substantial rights in the '579 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

58. The '579 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The '579 patent issued from U.S. Patent Application No. 16/783,845.

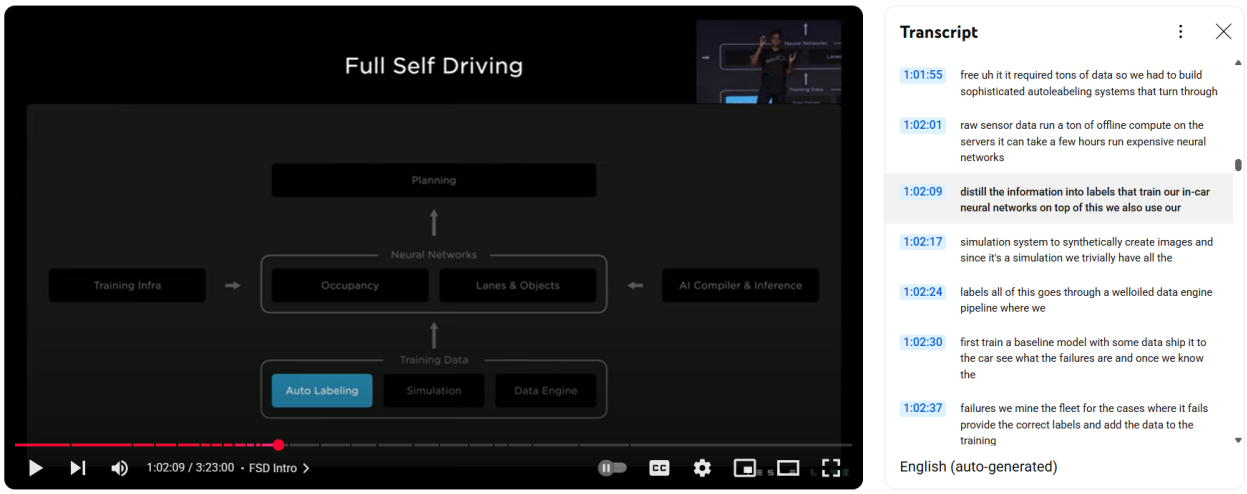
59. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claim 1 of the '579 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing systems that support Tesla vehicles with FSD software and hardware (the '579 Accused Products). Such infringement includes, but is not limited to, the making, using,

and/or selling of ’579 Accused Products that leverage and infringe the inventions of the ’579 patent.

60. On information and belief, Tesla directs and controls the ’579 Accused Products to operate in an infringing manner by providing the requisite FSD hardware and software instructions that infringe the ’579 patent. Furthermore, Tesla installs, services, and/or maintains the ’579 Accused Products provided to its customers. Tesla owns and controls the FSD software that automatically runs and controls the Tesla vehicles it provides to its customers. Tesla provides the FSD software, such that Tesla causes the ’579 Accused Products. Through its provision of the FSD software, Tesla causes the ’579 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the ’579 Accused Products by conditioning receipt of warranty benefits on the customer’s agreement not to modify the ’579 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

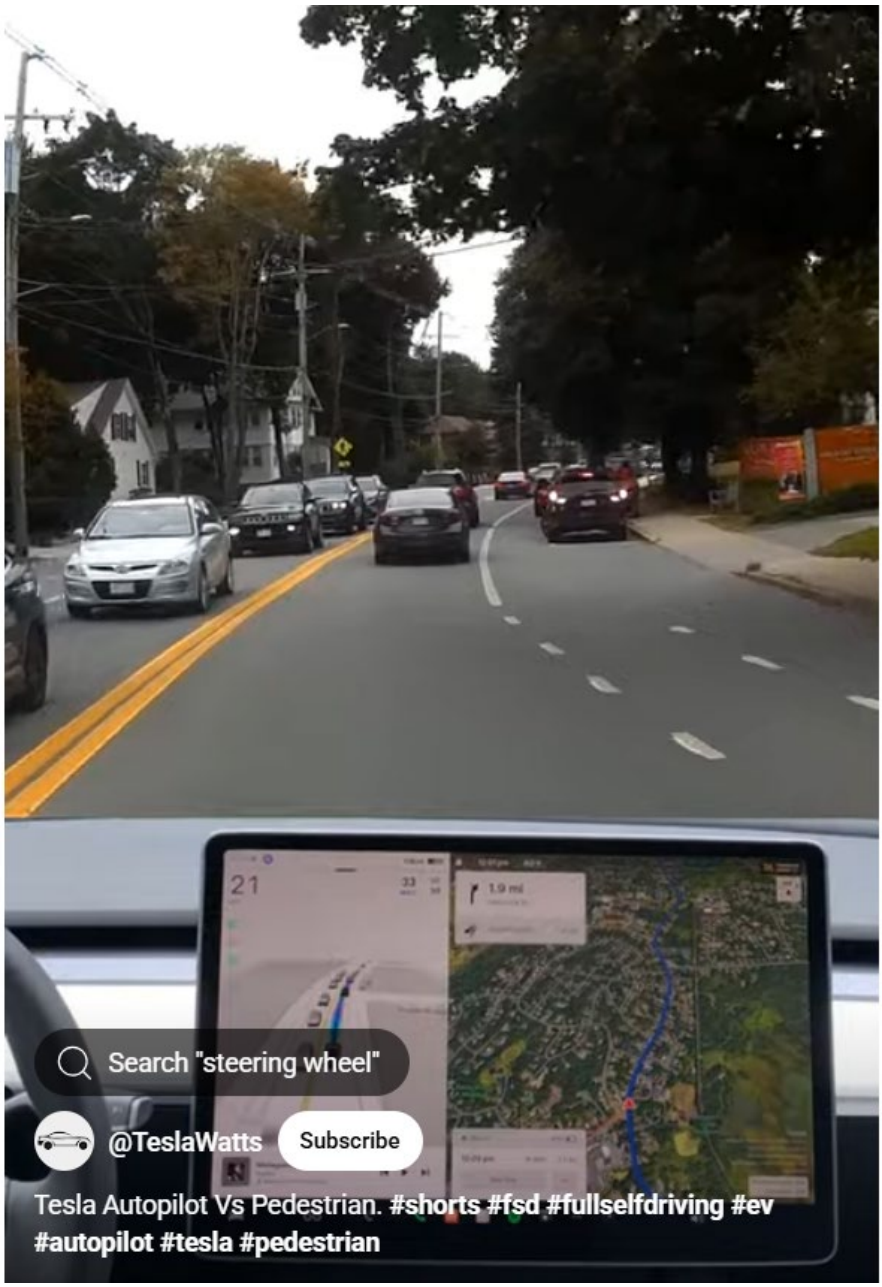
61. On information and belief, Tesla performs a method for navigating autonomous vehicles as described below. *See* https://www.tesla.com/fsd (“Watch the World’s First Autonomous Car Delivery”).

62. On information and belief, Tesla trains a probabilistic neural network. For example, Tesla datacenters (e.g., Dojo and/or Cortex) receive videos from the Tesla fleet that are used to train the FSD software. *See* https://electrek.co/2020/10/24/tesla-collecting-insane-amount-data-full-self-driving-test-fleet/ (“Tesla asked owners for the authorization to collect videos from the Autopilot cameras. After that, Tesla opened the floodgates of Autopilot data gathering.”). The FSD software is a probabilistic neural network:



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (describing Tesla's datacenters as being used to "train [Tesla's] in-car neural networks").

63. On information and belief, the probabilistic neural network is configured to receive as input, an image of traffic, the image displaying a traffic entity belonging to the traffic. For example, the FSD software is configured to receive images from the camera sensors on the Tesla vehicle. Such images correspond to a traffic entity, such as the vehicles in the oncoming lane. This is evidenced by the fact that the Tesla displays representations of such traffic entities on the display screen:

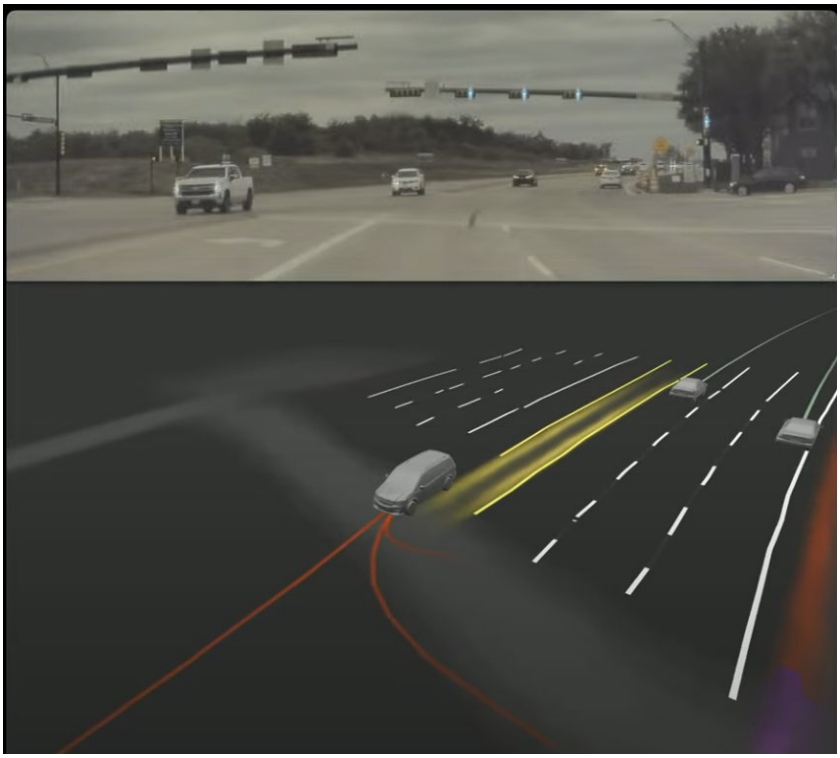


https://www.youtube.com/shorts/-fJzjyi6HkI.

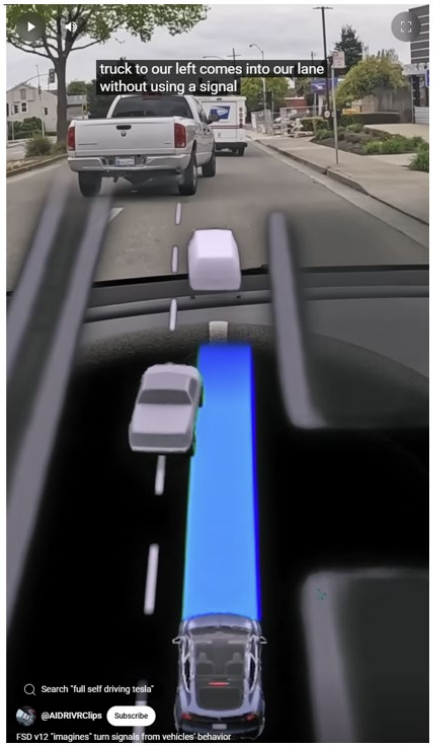
64. On information and belief, the probabilistic neural network is configured to generate a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature. For example, the FSD software is configured to produce a vector space. *See* https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (explaining that "across the full FSD platform all of these neural networks running in the car

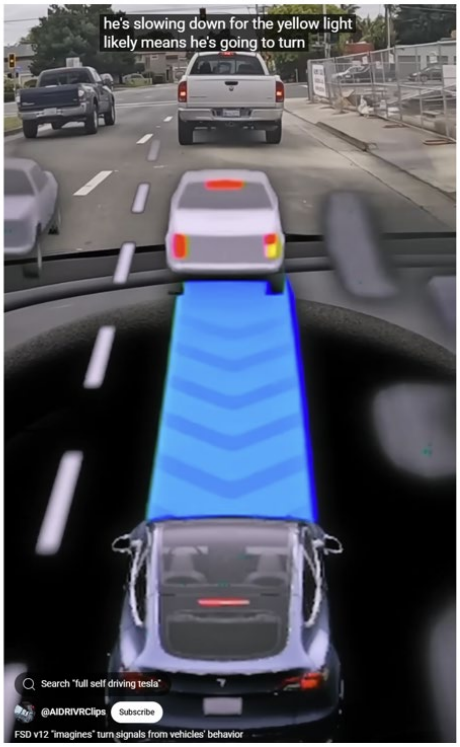
together produce the vector space which is again the model of the world around the robot or car.”). The FSD software uses the feature vector to provide a numerical representation of the vehicle’s surroundings, such as road edges.

65. On information and belief, the probabilistic neural network is configured to generate output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image. For example, the FSD software is configured to generate output representing hidden context for the traffic entity. This is evidenced by the fact that the Tesla displays evidence of such hidden context and reacts to traffic entities, such as pedestrians on the side of the road:

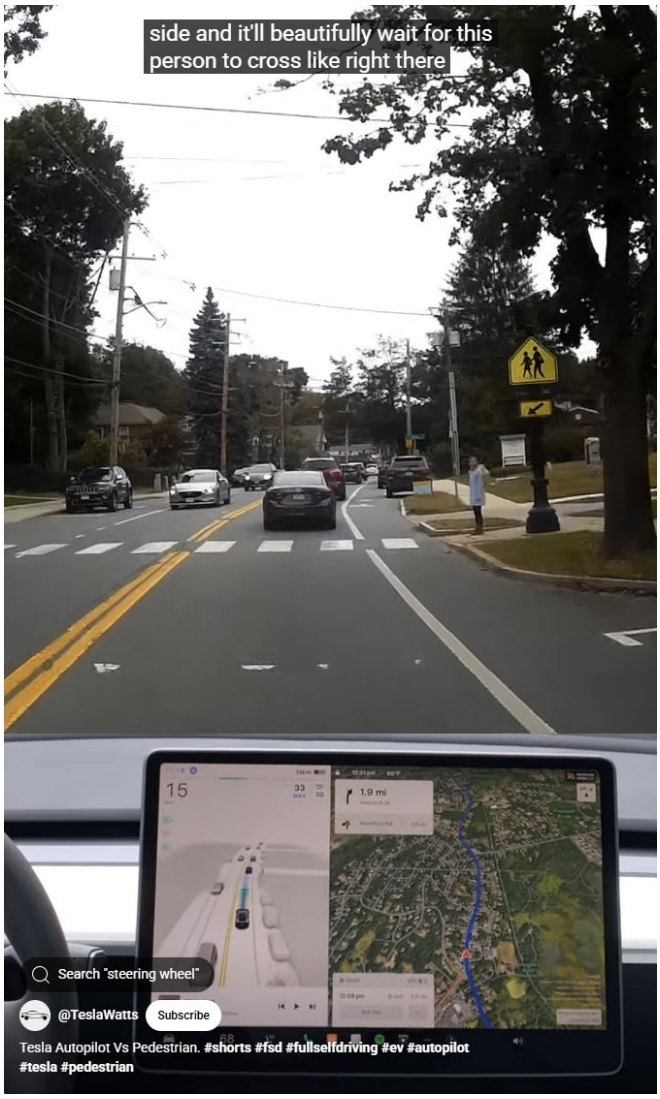


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).



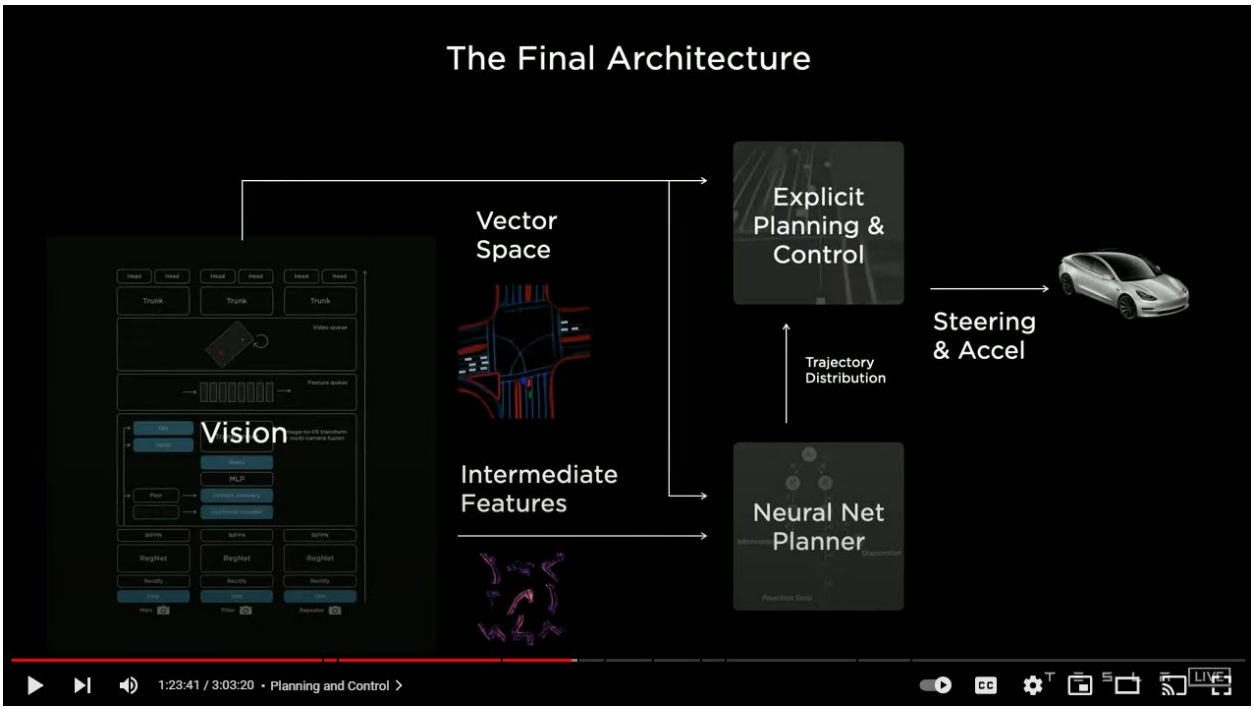


https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



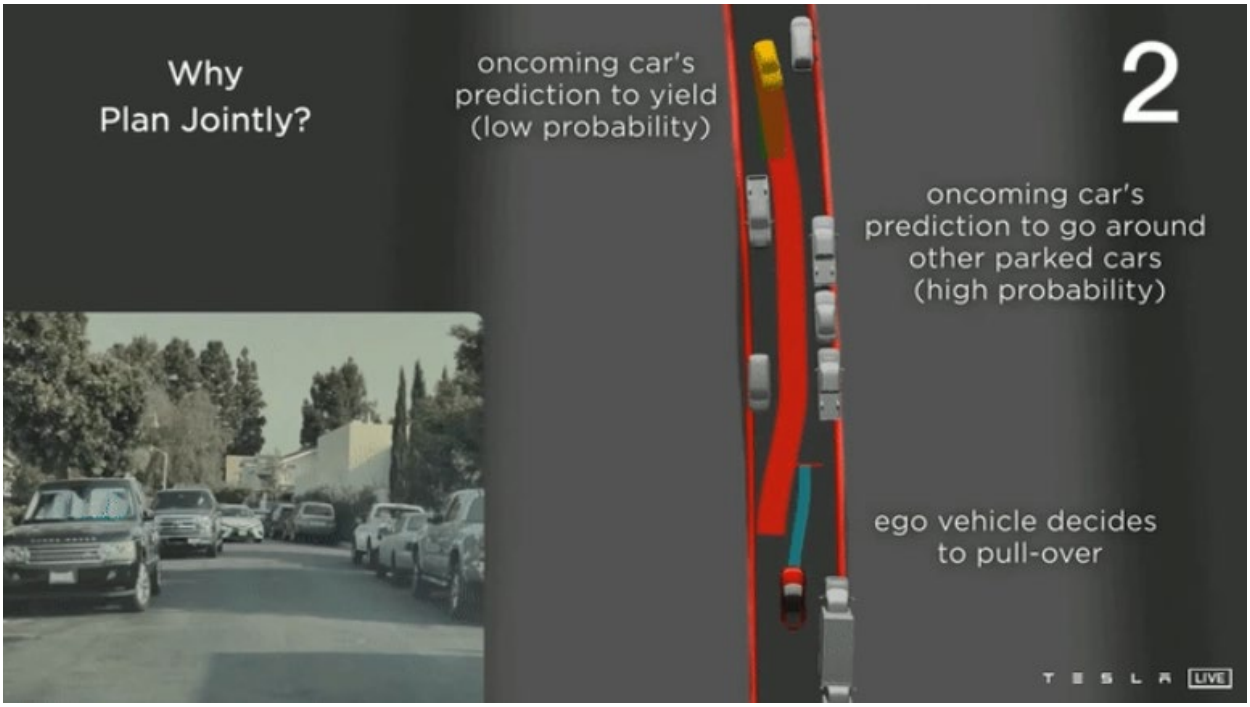
https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand). The generated output comprises values, such as probabilities, corresponding to how a user might react to such hidden context. This is evidenced in part by the fact that Tesla trained the FSD using driving videos "from humans when they handled a situation well," and corresponded to things "a five-star Uber driver would do." https://www.cnbc.com/2023/09/09/ai-for-cars-walter-isaacson-biography-of-elon-musk-excerpt.html.

66. Further, on information and belief, Tesla, at its datacenters (e.g., Dojo and/or Cortex), train the FSD software, which is a probabilistic neural network, that is configured to generate a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature.



See, e.g., www.youtube.com/watch?v=j0z4FweCy4M (Tesla AI Day 2021) (stating "So this is what a final architecture is going to look like. The vision system is going to crush down the dense video data into a vector space. It's going to be consumed by both an explicit planner and a neural network planner. In addition to this, the network planner can also consume intermediate features of the network. Together, this produces a trajectory distribution and it can be optimized end to end both with explicit cost functions and human intervention and other imitation data."). The generated feature vector is associated with at least one traffic entity (*e.g.*, the oncoming car in the image below) for a plurality of features (*e.g.*, first feature = probability that the oncoming car will yield;

and second feature = probability that the oncoming vehicle go around the other parked cars), such as for the oncoming vehicle illustrated in the picture below:



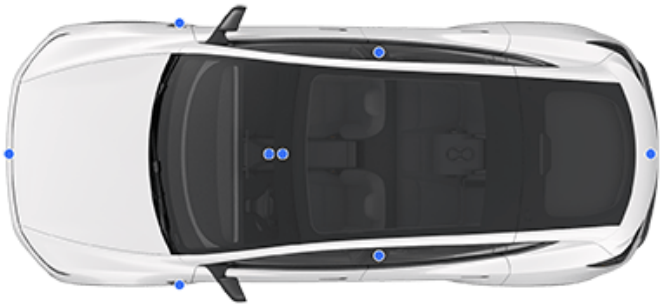
https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021). Continuing with this example, the feature vector comprises values describing statistical distribution for each feature. On information and belief, the first value may be a low number indicating a low statistical chance that the first feature as to whether the oncoming car will yield, and the second value may be a high number indicating a high statistical chance that the second feature as to whether the oncoming car will go around other parked cars. These values correspond to the statistical distribution received by user responses from one or more users (e.g., Tesla labelers) presented with this image and indicating their prediction as to hidden context regarding the state of mind of the driver of the oncoming car to predict whether that driver will yield or go around other parked cars (or some other action). The FSD software then generates output representing these values as

illustrated in the image above showing a low likelihood green path of the oncoming car yielding and a high likelihood red path of the oncoming car going around other parked cars.

67. On information and belief, Tesla receives a new image captured by a camera mounted on an autonomous vehicle navigating through traffic. For example, while in operation the FSD software receives a new image from one of the cameras on the vehicle:

Cameras

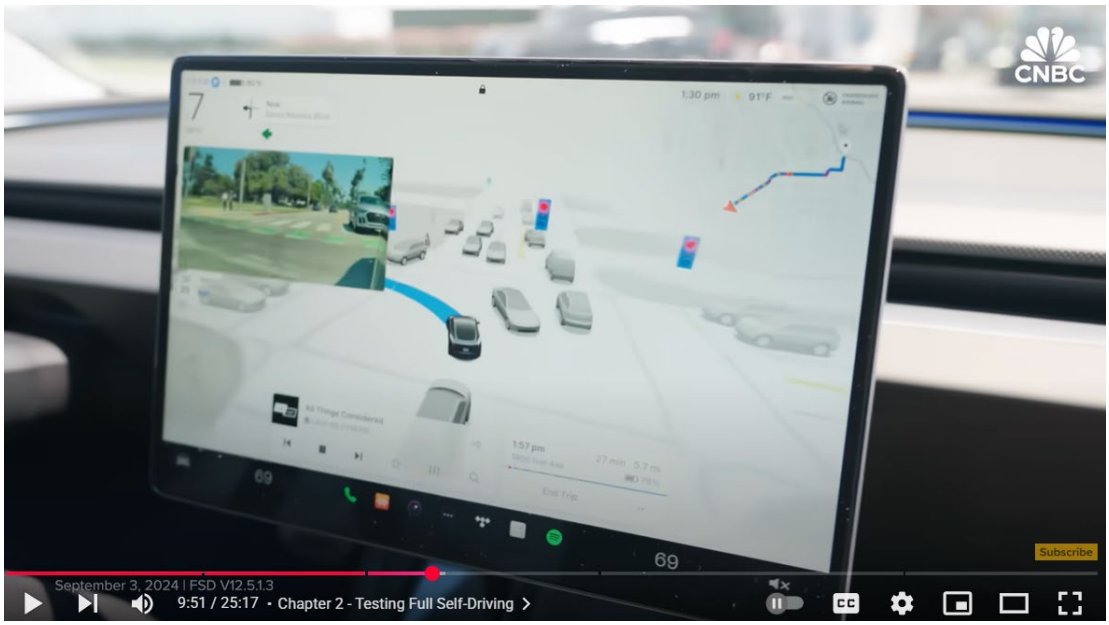
Your Model Y includes the following components that actively monitor the surrounding area:



- A camera is mounted above the grille on the front bumper.
- A camera is mounted above the rear license plate.
- A camera is mounted in each door pillar.
- Two cameras are mounted to the windshield above the rear view mirror.
- A camera is mounted to each front fender.

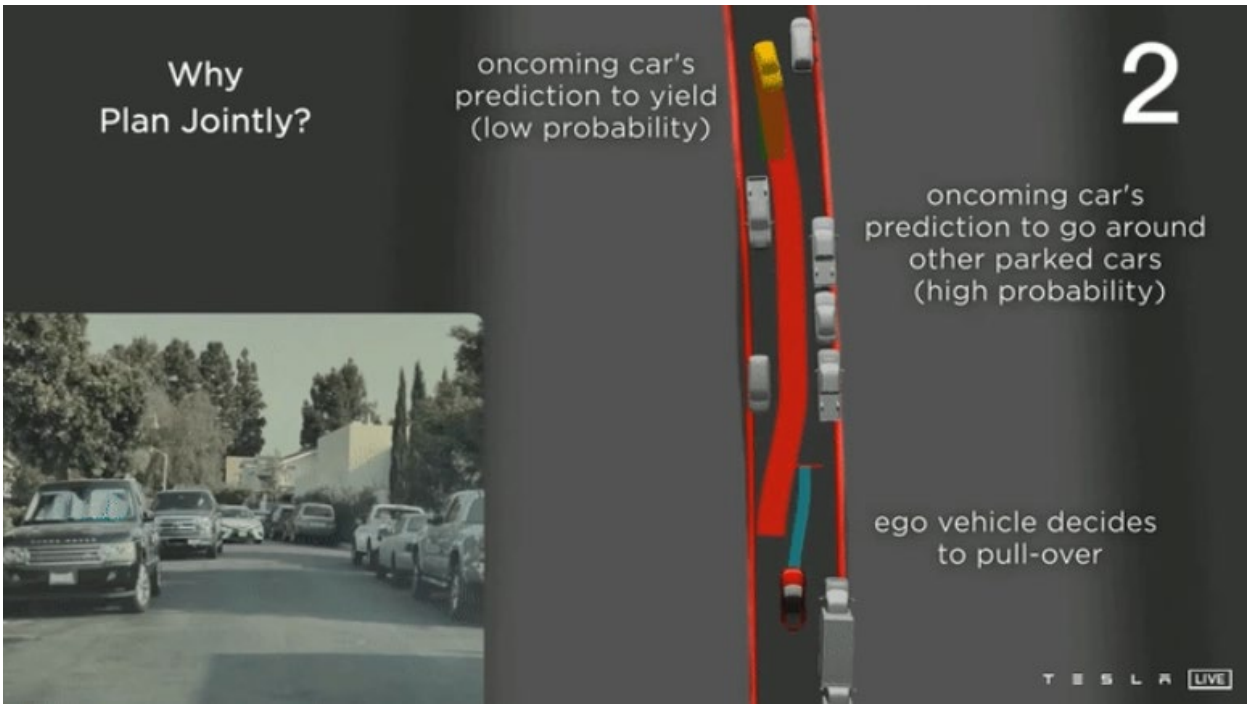
Model Y is also equipped with high precision electronically-assisted braking and steering systems.

https://www.tesla.com/ownersmanual/modely/en_us/GUID-682FF4A7-D083-4C95-925A-5EE3752F4865.html. This is further evidenced by the Tesla display which displays such images:



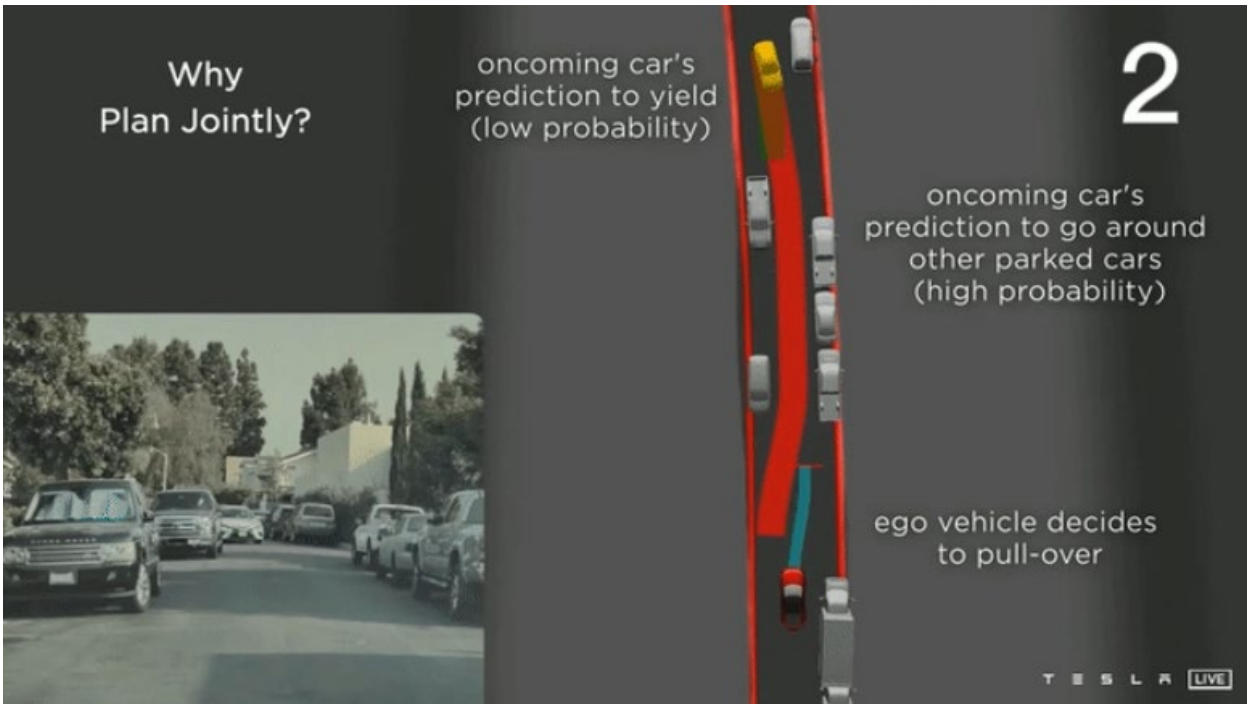
https://www.youtube.com/watch?v=JuwK-vvvYgY.

68. On information and belief, Tesla executes the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image. For example, the probabilistic network of the FSD software is executed to generate output representing hidden context for at least a traffic entity displayed in the new image:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

69. On information and belief, Tesla determines a measure of uncertainty for each of the plurality of values and navigates the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network. For example, the FSD software determines a high measure of uncertainty for the first value indicating a low probability that the oncoming car will yield and a low measure of uncertainty for the second value indicating a high probability that the oncoming car will go around other parked cars. Thus, the FSD software navigates the vehicle to pull-over as illustrated below:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

70. The specific ways in which the ’579 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the ’579 Accused Products.

71. The technology discussion above and the exemplary ’579 Accused Products provide context for Plaintiff’s infringement allegations.

72. The claims of the ’579 patent are patent eligible under 35 U.S.C. § 101. The ’579 patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. The claims of the ’579 patent are directed to specific technological advancements of autonomous vehicles that more accurately predicts the behavior of traffic entities (*e.g.*, such as people, bicycles, vehicles) encountered by an autonomous vehicle. ’579 patent at 4:8-22. The specification of the ’579 patent explains that conventional methods for controlling an autonomous vehicle do not predict a moving

object's actions or movements based on other observations besides the object's past movements, which lead to inferior results in predicting the object's future behavior. *Id*. at 1:38-62. For example, conventional methods for controlling an autonomous vehicle could not reliably anticipate whether a person walking on a sidewalk will cross the street, whether another person will remain standing on a street corner, and whether another person will change lanes on his or her bicycle. *Id*. The failure of conventional methods of controlling autonomous vehicles to accurately predict motion of non-stationary traffic objects results in unnatural movement of the autonomous vehicle. *Id*. The '579 patent provides several technical features that embody a technical solution to the problems of conventional methods. For example, the technological process of claim 1 trains a probabilistic neural network that is used to generate output representing hidden context for a traffic entity displayed in a received image; and determines a measure of uncertainty for each of a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image. *Id.*at 18:34-63 ("Each prediction component 130 predicts 918 output values of the hidden context. The neural network 120 may generate a different output in each execution and the output values have a particular statistical distribution that is determined by the parameters of the neural network 120. The model training system 112 determines 925 statistical distribution of the predicted output values. The model training system 112 compares 930 the statistical distribution of the predicted output values with the statistical distribution of the user responses received by presenting the video frame to users as a stimulus. The model training system 112 may determine a loss function value based on the statistical distribution of the predicted output values with the statistical distribution of the user responses. The model training system 112 adjusts the parameters of the neural network 120 by performing back propagation to minimize the loss function … The vehicle computing system 122 executes the neural network to generate outputs

indicating values of hidden context attributes and uncertainty values associated with the predicted outputs."). The technological process of claim 1 navigates the autonomous vehicle to avoid the traffic entity displayed in the image, where the navigation is based on at least the measure of uncertainty generated by the probabilistic neural network. *Id.* at 18:63-19:2 ("The vehicle computing system 122 uses the output of the neural network 120 to navigate the autonomous vehicle through the traffic. In an embodiment, the vehicle computing system 122 uses the output generated by the neural network to generate control signals provided to the controls of the vehicle, for example, braking system, accelerator, steering, and so on."); *see also id.* at 2:36-40 ("The measure of uncertainty is used to navigate the vehicle through traffic, for example, to determine how far to stay from a traffic entity displayed in the image that was provided as input to the probabilistic neural network."), 14:51-63 ("The vehicle computing system 122 predicts hidden context representing intentions and future plans of a traffic entity. The hidden context may be used for navigating the autonomous vehicle, for example, by adjusting the path planning of the autonomous vehicle based on the hidden context. The vehicle computing system 122 may improve the path planning by taking a machine learning based model that predicts the hidden context representing a level of human uncertainty about the future actions of pedestrians and cyclists and uses that as an input into the autonomous vehicle's motion planner."). Thus, the claims of the '579 patent are directed at specific asserted improvements in computer functionalities, specifically to autonomous vehicles, and not directed to abstract ideas. Further, as shown above, the ordered combination of the various claim elements of the claims of the '579 patent results in an unconventional manner result that is highly beneficial to autonomous vehicles—e.g., operation of an autonomous vehicle that more accurately predicts the behavior of pedestrians, bicycles, and

other vehicles. The claims of the ’579 patent encompass a “technology-based solution” to a problem that is unique to the operations of autonomous vehicles and are therefore patent eligible.

73. At a minimum, Tesla has known about the ’579 patent and its infringement of the ’579 patent at least as early as the filing date of the Complaint. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of this Complaint.

74. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla has actively induced, under U.S.C. § 271(b), its distributors, customers, testing outfits, subsidiaries, importers, and/or consumers to directly infringe one or more claims of the ’579 patent by using and/or testing the ’579 Accused Products. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’579 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the ’579 Accused Products, creating and/or maintaining established distribution channels for the ’579 Accused Products into and within the United States, manufacturing the ’579 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the ’579 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

75. On information and belief, despite having knowledge of the ’579 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the ’579 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla’s infringing activities relative to the ’579 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

76. Perceptive has been damaged as a result of Tesla’s infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla’s infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT IV

(INFRINGEMENT OF U.S. PATENT NO. 11,520,346)

77. Plaintiff incorporates paragraphs 1 through 76 herein by reference.

78. Perceptive is the assignee of the ’346 patent, entitled “Navigating Autonomous Vehicles Based on Modulation of a World Model Representing Traffic Entities,” with ownership of all substantial rights in the ’346 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

79. The ’346 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The ’346 patent issued from U.S. Patent Application No. 16/777,673.

80. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claim 1 of the ’346 patent in this judicial

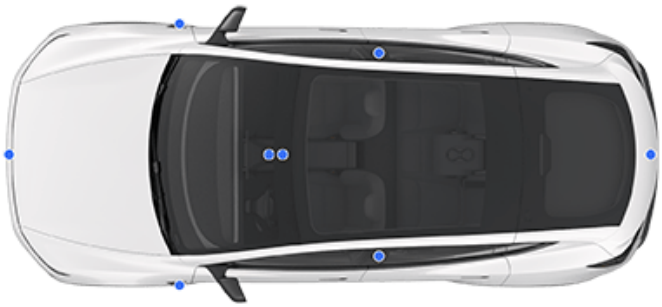
district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing systems that support Tesla vehicles with FSD software and hardware (the '346 Accused Products). Such infringement includes, but is not limited to, the making, using, and/or selling of '346 Accused Products that leverage and infringe the inventions of the '346 patent.

81. On information and belief, Tesla directs and controls the '346 Accused Products to operate in an infringing manner by providing the requisite FSD hardware and software instructions that infringe the '346 patent. Furthermore, Tesla installs, services, and/or maintains the '346 Accused Products that it provided to its customers. Tesla owns and controls the FSD software that automatically runs on and controls the '346 Accused Products. Through its provision of the FSD software, Tesla causes the '346 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the '346 Accused Products by conditioning receipt of warranty benefits on the customer's agreement not to modify the '346 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

82. On information and belief, Tesla performs a method comprising receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images. For example, the '346 Accused Products comprise an autonomous vehicle. *See* https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery"). The '346 Accused Products comprise sensors mounted on the autonomous vehicle:

Cameras

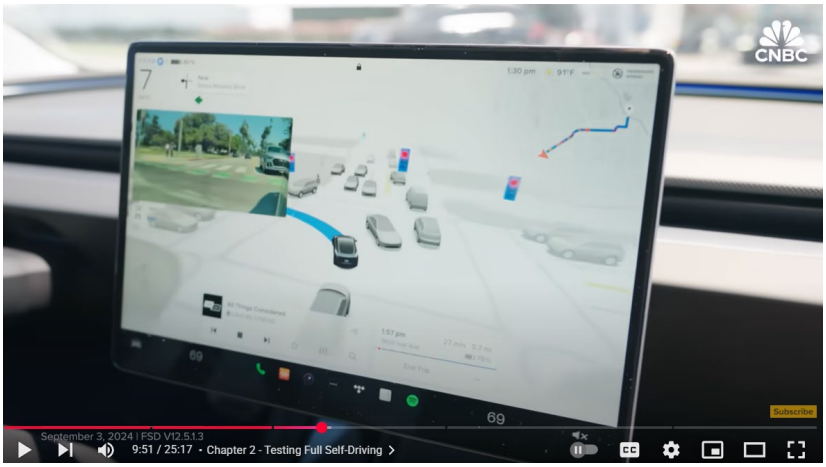
Your Model Y includes the following components that actively monitor the surrounding area:



- A camera is mounted above the grille on the front bumper.
- A camera is mounted above the rear license plate.
- A camera is mounted in each door pillar.
- Two cameras are mounted to the windshield above the rear view mirror.
- A camera is mounted to each front fender.

Model Y is also equipped with high precision electronically-assisted braking and steering systems.

https://www.tesla.com/ownersmanual/modely/en_us/GUID-682FF4A7-D083-4C95-925A-5EE3752F4865.html. The sensors provide the FSD software sensor data corresponding to images of the driving environment:



https://www.youtube.com/watch?v=JuwK-vvvYgY.

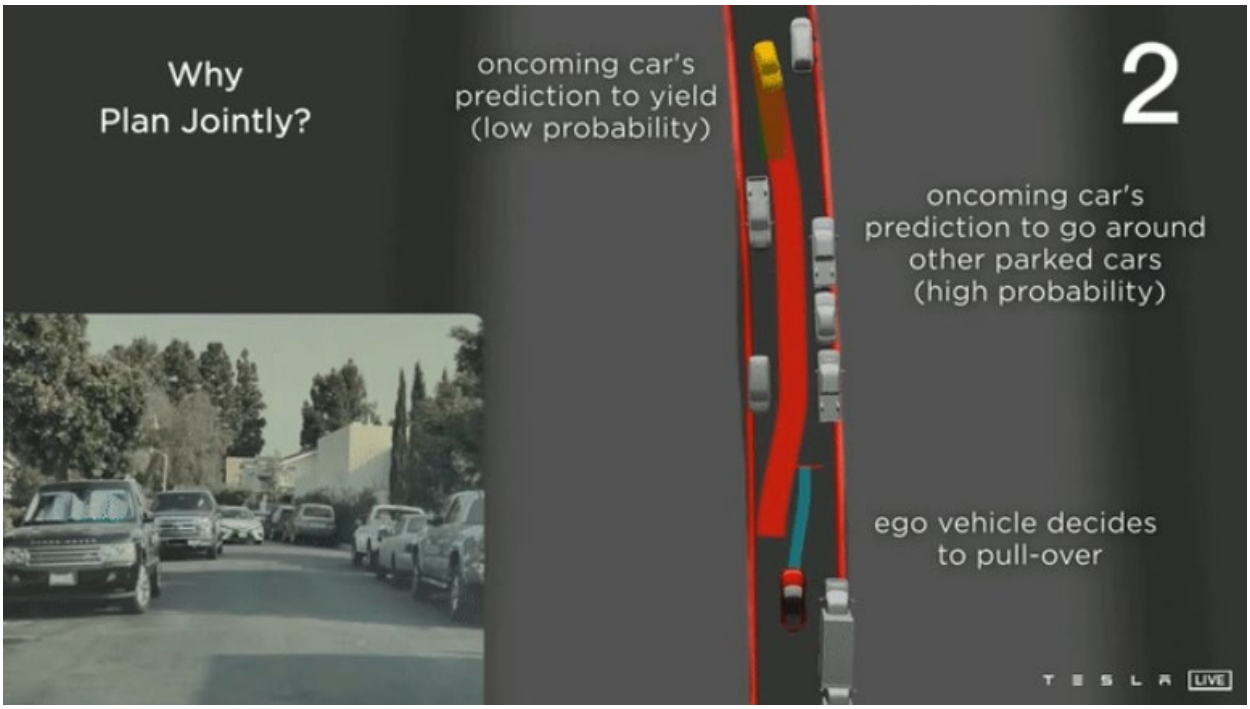
83. On information and belief, Tesla generates a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data. For example, Tesla uses the on vehicle cameras to create a 3D rendering of the vehicle's surroundings.

https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

84. On information and belief, Tesla identifies one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving. For example, the FSD software identifies various moving vehicles (represented as a collection of dark blue cubes).

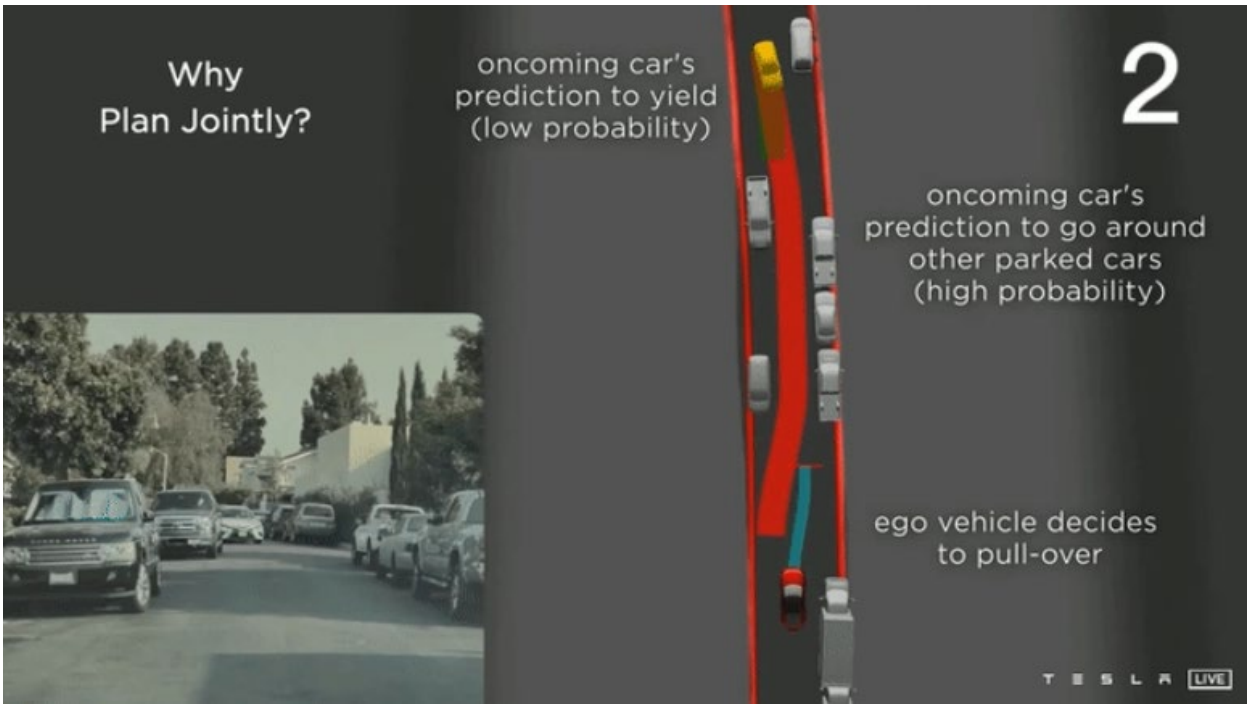
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

85. On information and belief, for each of the one or more traffic entities, Tesla determines one or more motion parameters describing movement of the traffic entity. For example, the FSD software identifies an oncoming vehicle and determines a projected path:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

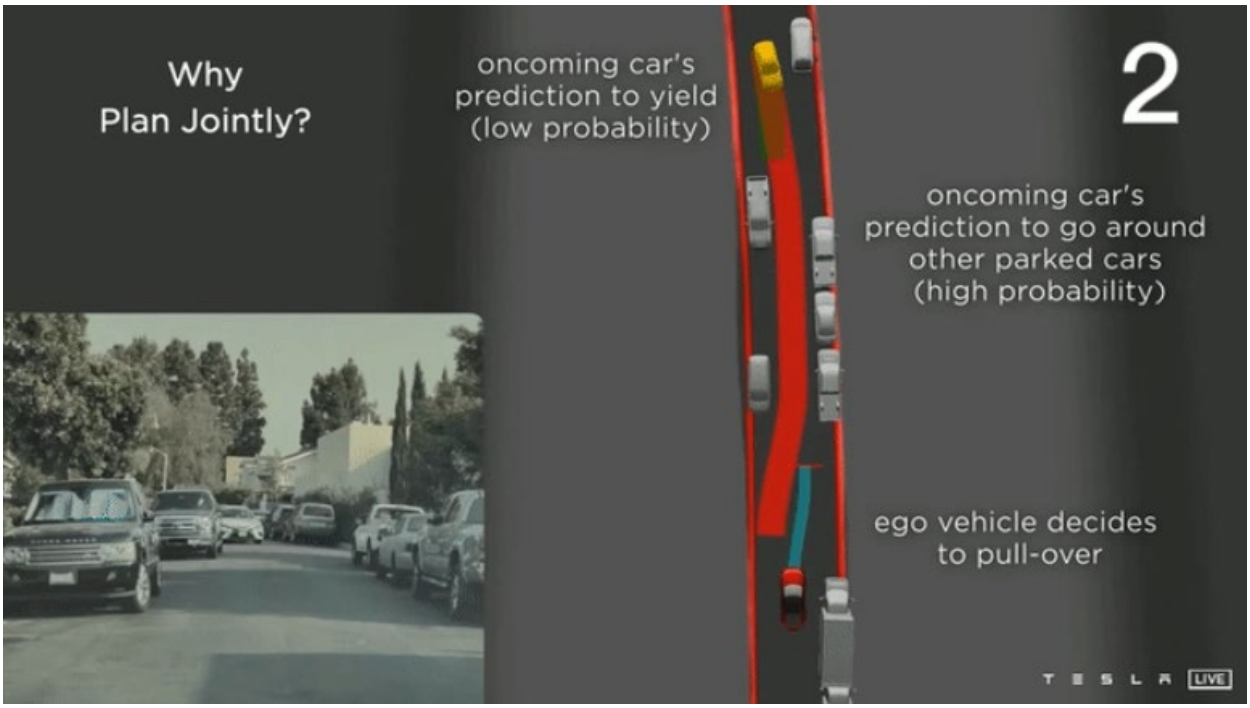
86. On information and belief, for each of the one or more traffic entities, Tesla provides an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image. For example, an image showing the oncoming car is input into the FSD software (a machine learning model) which outputs summary statistics (e.g., low or high probability) of expected human responses describing a hidden context of the oncoming car (e.g., will the oncoming car yield, will the oncoming car go around other parked cars):



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

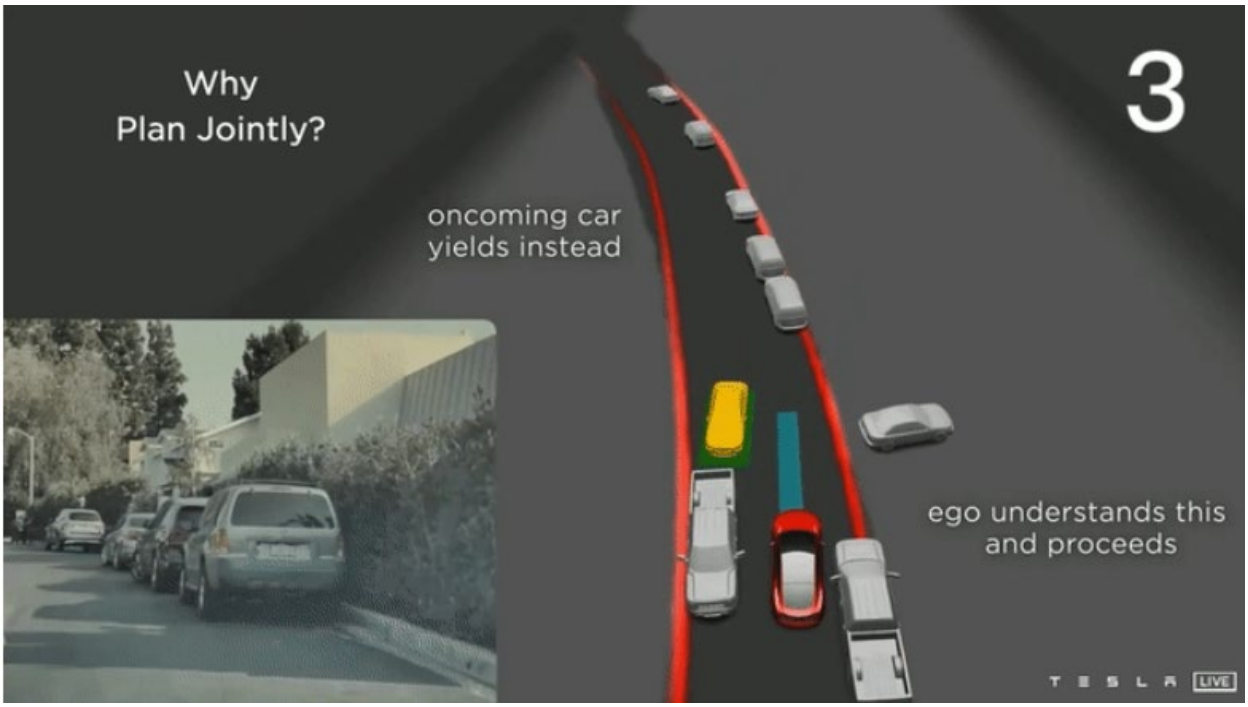
87. On information and belief, for each of the one or more traffic entities, Tesla determines the hidden context of the traffic entity based on the output of the machine learning based model. As described in the previous paragraph, the FSD software determines the hidden context of the traffic entity based on the summary statistics it outputs.

88. On information and belief, for each of the one or more traffic entities, Tesla determines a region of the point cloud where the traffic entity is expected to reach within a threshold time interval. For example, in the below video the FSD software determines that the oncoming vehicle is expected to occupy the space shown by the red path within the decision time window for the vehicle on which the FSD software operates:



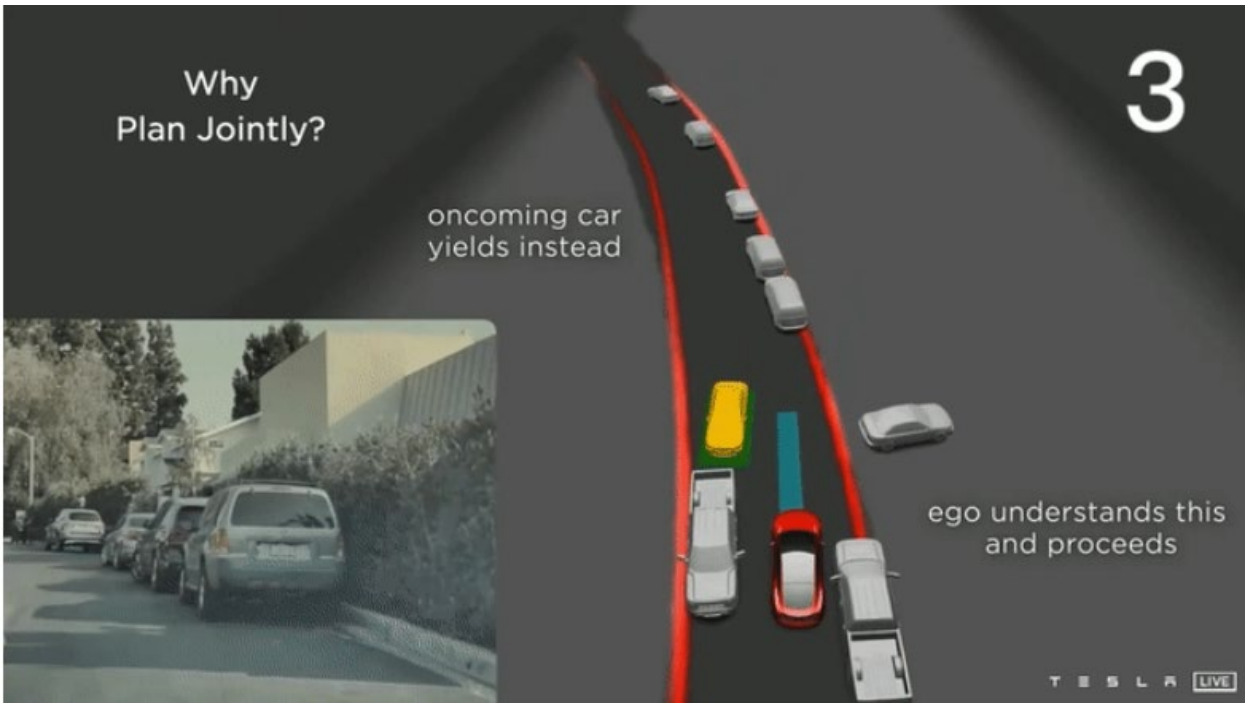
https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

89. On information and belief, for each of the one or more traffic entities, Tesla modifies the region based on the hidden context of the traffic entity. As depicted in the image and illustration below, the FSD software modifies the region based on the hidden context of a high probability that the oncoming car will now yield and a low probability that the oncoming car will continue to go around other parked cars:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

90. On information and belief, Tesla navigates the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities. For example, the FSD software maintains a minimum distance from the modified region to avoid collisions:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

91. The specific ways in which the ’346 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the ’346 Accused Products.

92. The technology discussion above and the exemplary ’346 Accused Products provide context for Plaintiff’s infringement allegations.

93. The claims of the ’346 patent are patent eligible under 35 U.S.C. § 101. The ’346 patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. The claims of the ’346 patent are directed to specific technological advancements of autonomous vehicles that more accurately predicts the behavior of traffic entities (e.g., such as people, bicycles, vehicles) encountered by an autonomous vehicle. ’346 patent at 5:34-55. The specification of the ’346 patent explains that conventional methods for controlling an autonomous vehicle fail to accurately predict motion of certain non-stationary objects (e.g., pedestrians and bicyclists) when they merely

determine if an object is likely to come in the path of the autonomous vehicle. *Id.* at 1:46-60. For example, conventional methods for controlling an autonomous vehicle could not reliably anticipate whether a person walking on a sidewalk will cross the street, whether another person will remain standing on a street corner, and whether another person will change lanes on his or her bicycle. *Id*. The failure of conventional methods of controlling autonomous vehicles to accurately predict motion of non-stationary traffic objects results in unnatural movement of the autonomous vehicle. *Id*. The '346 patent provides several technical features that embody a technical solution to the problems of conventional methods. For example, the technological process of claim 1 leverages a machine learning model that is configured to receive an input image showing an input traffic entity (e.g., a pedestrian or bicyclist) and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image. *Id.* at 26:16-22; *see also* 14:55-15: 3 ("The vehicle computing system 120 predicts hidden context representing intentions and future plans of a traffic entity (e.g., a pedestrian or a bicyclist). The hidden context may represent a state of mind of a person represented by the traffic entity.); 15:23-38 ("In an embodiment, the prediction engine 114 determines a metric representing a degree of uncertainty in human assessment of the near-term goal of a pedestrian or any user representing a traffic entity. The specific form of the representation of uncertainty is a model output that is in the form of a probability distribution, capturing the expected distributional characteristics of user responses of the hidden context of traffic entities responsive to the users being presented with videos/images representing traffic situations. The model output may comprise summary statistics of hidden context, i.e., the central tendency representing the mean likelihood that a person will act in a certain way and one or more parameters including the variance, kurtosis, skew, heteroskedasticity, and multimodality of the predicted human distribution."). The technological process of claim 1 uses

the output of the machine learning based model to determine the hidden context of the traffic entity and modify a region of a point cloud representation of the surrounding of the autonomous vehicle (generated based on sensor data of the vehicle) where the traffic entity is expected to reach within a threshold time interval. *Id.* at 26:23-30; *see also* 15:57-16:24 ("The vehicle computing system 120 receives 700 sensor data from sensors of the autonomous vehicle… The vehicle computing system 120 identifies 702 one or more traffic entities based on the sensor data, for example, pedestrians, bicyclists, or other vehicles driving in the traffic. The traffic entities represent non-stationary objects in the surroundings of the autonomous vehicle … In an embodiment, the autonomous vehicle obtains a map of the region through which the autonomous vehicle is driving … The map may include a point cloud representation of the region around the autonomous vehicle. The autonomous vehicle performs localization to determine the location of the autonomous vehicle in the map and accordingly determines the stationary objects in the point cloud surrounding the autonomous vehicle. The autonomous vehicle may superimpose representations of traffic entities on the point cloud representation generated. The vehicle computing system 120 repeats the following steps 704 and 706 for each identified traffic entity. The vehicle computing system 120 determines 704 motion parameters for the traffic entity, for example, speed and direction of movement of the traffic entity. The vehicle computing system 120 also determines 706 a hidden context associated with the traffic entity using the prediction engine 114."). The vehicle of claim 1 is then navigated to stay at least a threshold distance away from the modified region the traffic entity. *Id.* at 31-34; *see also Id*. at 16: 25-36 ("The vehicle computing system 120 navigates 708 the autonomous vehicle based on the motion parameters as well as the hidden context. For example, the vehicle computing system 120 may determine a safe distance from the traffic entity that the autonomous vehicle should maintain based on the motion parameters of the traffic entity.

The vehicle computing system 120 modulates the safe distance based on the hidden context. The vehicle computing system 120 may adjust the safe distance based on whether the near-term goal of the person indicating that the person intends to reach a location in the direction of the movement of the traffic entity or in a different direction.”). Thus, the claims of the ’346 patent are directed at specific asserted improvements in computer functionalities, specifically to autonomous vehicles, and not directed to abstract ideas. Further, as shown above, the ordered combination of the various claim elements of the claims of the ’346 patent results in an unconventional manner result that is highly beneficial to autonomous vehicles—e.g., operation of an autonomous vehicle that more accurately predicts the behavior of pedestrians, bicycles, and other vehicles. The claims of the ’346 patent encompass a “technology-based solution” to a problem that is unique to the operations of autonomous vehicles and are therefore patent eligible.

94. At a minimum, Tesla has known about the ’346 patent and its infringement of the ’346 patent at least as early as the filing date of the Complaint. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of this Complaint.

95. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla has actively induced, under U.S.C. § 271(b), its distributors, customers, testing outfits, subsidiaries, importers, and/or consumers to directly infringe one or more claims of the ’346 patent by using and/or testing the ’346 Accused Products. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’346 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by

its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the ’346 Accused Products, creating and/or maintaining established distribution channels for the ’346 Accused Products into and within the United States, manufacturing the ’346 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the ’346 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

96. On information and belief, despite having knowledge of the ’346 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the ’346 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla’s infringing activities relative to the ’346 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

97. Perceptive has been damaged as a result of Tesla’s infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla’s infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT V

(INFRINGEMENT OF U.S. PATENT NO. 11,753,046)

98. Plaintiff incorporates paragraphs 1 through 97 herein by reference.

99. Perceptive is the assignee of the ’046 patent, entitled “System and Method of Predicting Human Interaction with Vehicles,” with ownership of all substantial rights in the ’046 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements.

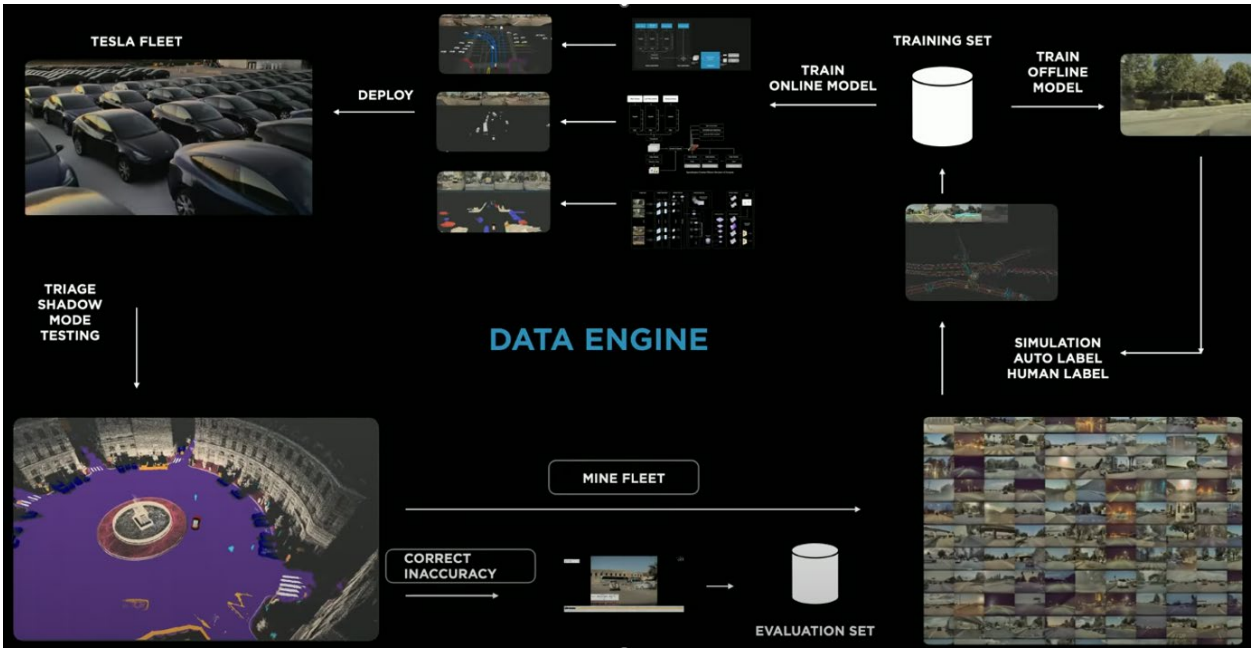
100. The ’046 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code. The ’046 patent issued from U.S. Patent Application No. 17/468,516.

101. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claim 1 of the ’046 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing FSD software and hardware, Tesla vehicles with FSD software and hardware, and/or systems that support Tesla vehicles with FSD software and hardware (the ’046 Accused Products). Such infringement includes, but is not limited to, the making, using, and/or selling of ’046 Accused Products that leverage and infringe the inventions of the ’046 patent.

102. On information and belief, Tesla directs and controls the ’046 Accused Products to operate in an infringing manner by providing the FSD hardware and software instructions that infringe the ’046 patent. Furthermore, Tesla installs, services, and/or maintains the ’046 Accused Products that it provided to its customers. Tesla owns and controls the FSD software which automatically runs on and controls the ’046 Accused Products. Through its provision of the FSD software, Tesla causes the ’046 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the ’046 Accused Products by conditioning receipt of warranty benefits on the customer’s agreement not to modify the ’046 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-

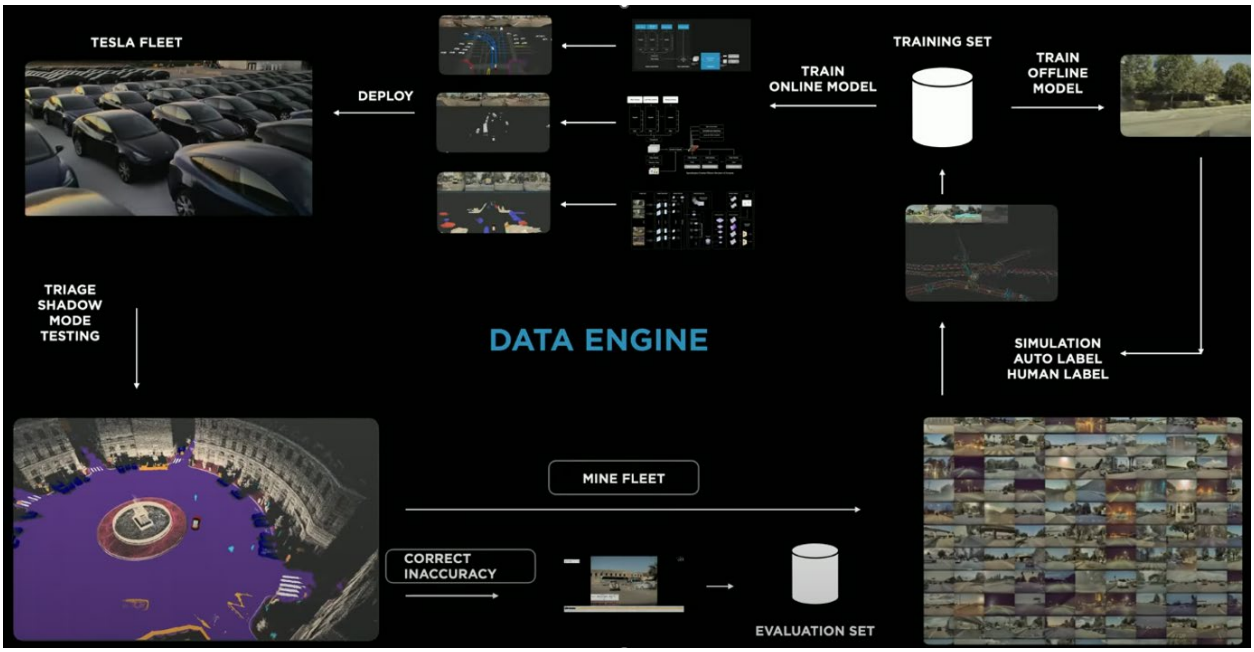
contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

103. On information and belief, Tesla performs a computer-implemented method comprising storing a plurality of images, each image displaying one or more users. For example, Tesla stores, at one or more of its datacenters (e.g., Dojo, Cortex), a plurality of images displaying one or more users (e.g., vehicle, pedestrian).



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

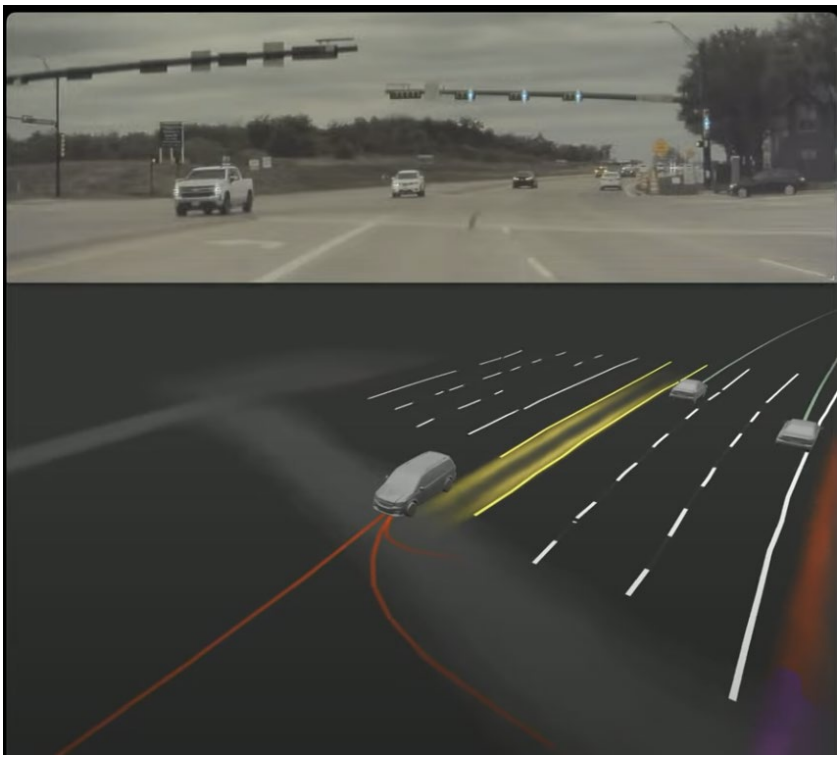
104. On information and belief, Tesla generates training data from the plurality of images, the generating comprising sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image.



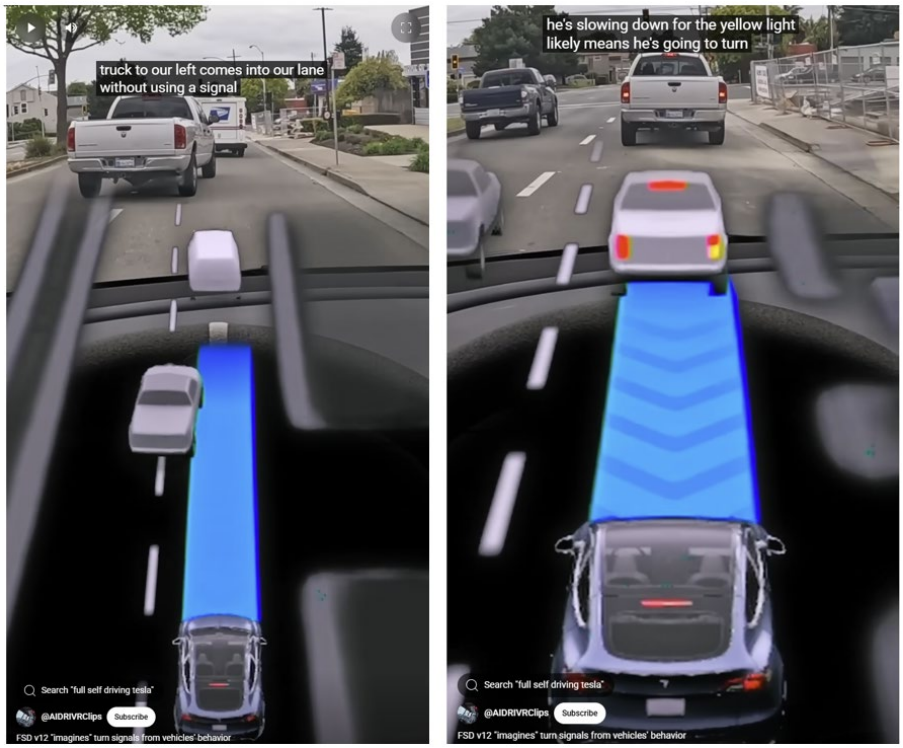
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

For example, Tesla's in-house team of over 1,000 data labelers provide advanced labeling that describe a state of mind of a road user displayed in one or more images. In the example illustrated below, a labeler is asked six questions about the state of mind of a road in the image: stopped_double_parked, stopped_traffic_controls, stopped_idle_in_lane, stopped_pulled_over, stopped_traffic, or parked.

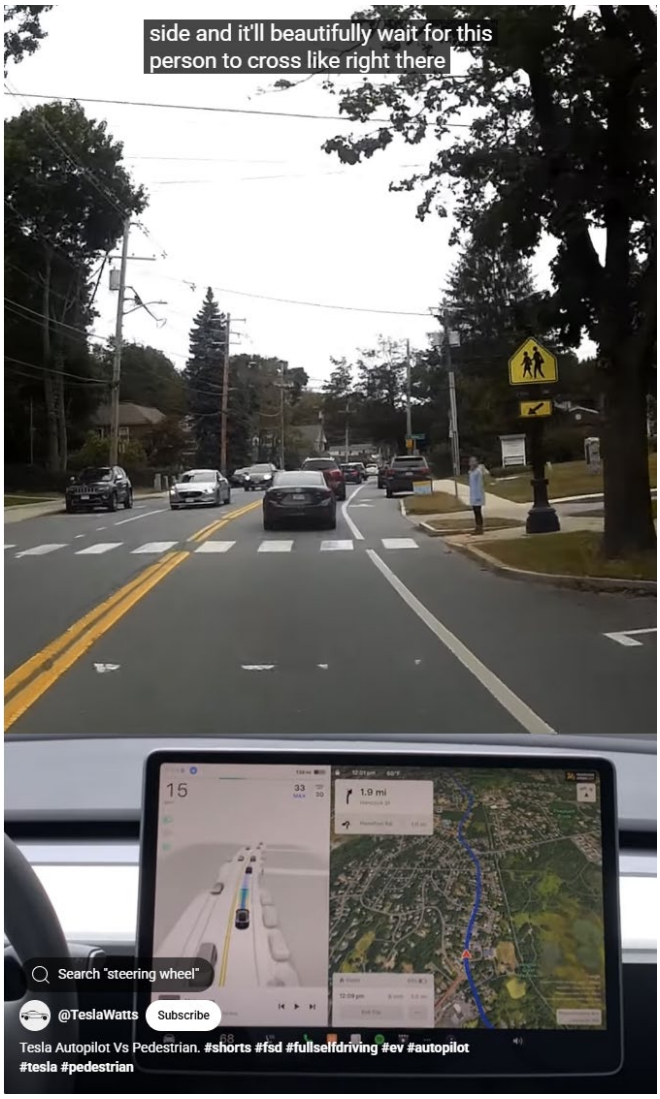
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). Another Tesla labeler reviewing this video makes a new prediction that the car is parked and not stopped because of traffic, which adds a new weight to the prediction of the statistical summary. On information and belief, Tesla uses similar tooling mechanisms to collect multiple answers to questions from many different labelers regarding the state of mind of a road user in thousands for certain images/videos showing a user in an image. Tesla gathers a statistical summary of answers that describe a state of mind of a road user (e.g., will the road user in a stopped vehicle in the left hand lane perform a u-turn, left turn, or continue forward; will a pedestrian road user cross the road or not; will a road user of a vehicle in the right hand lane continue forward or make a right hand turn if it just merged into the lane of the autonomous vehicle). The examples below illustrate that the answers provided by human observers are collected as to the state of mind of road users in the scenarios where the state of mind of road users is considered in the scenarios depicted below.



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will make a left turn, u-turn, or continue forward).



https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).

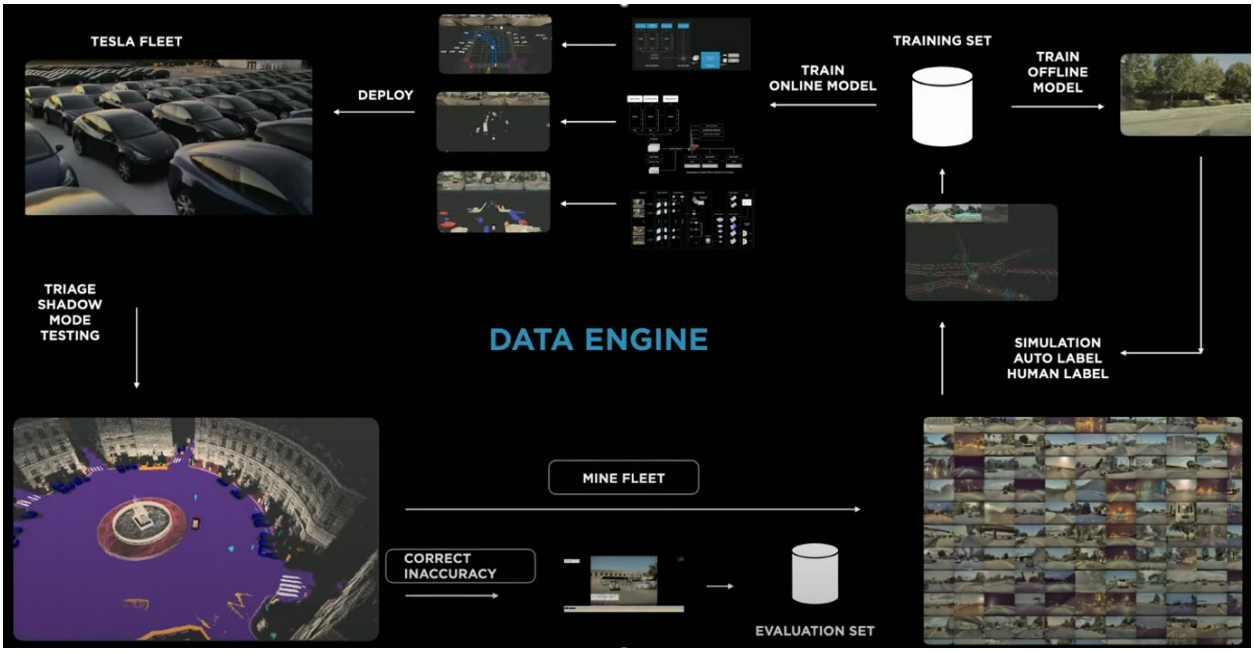


https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand still).

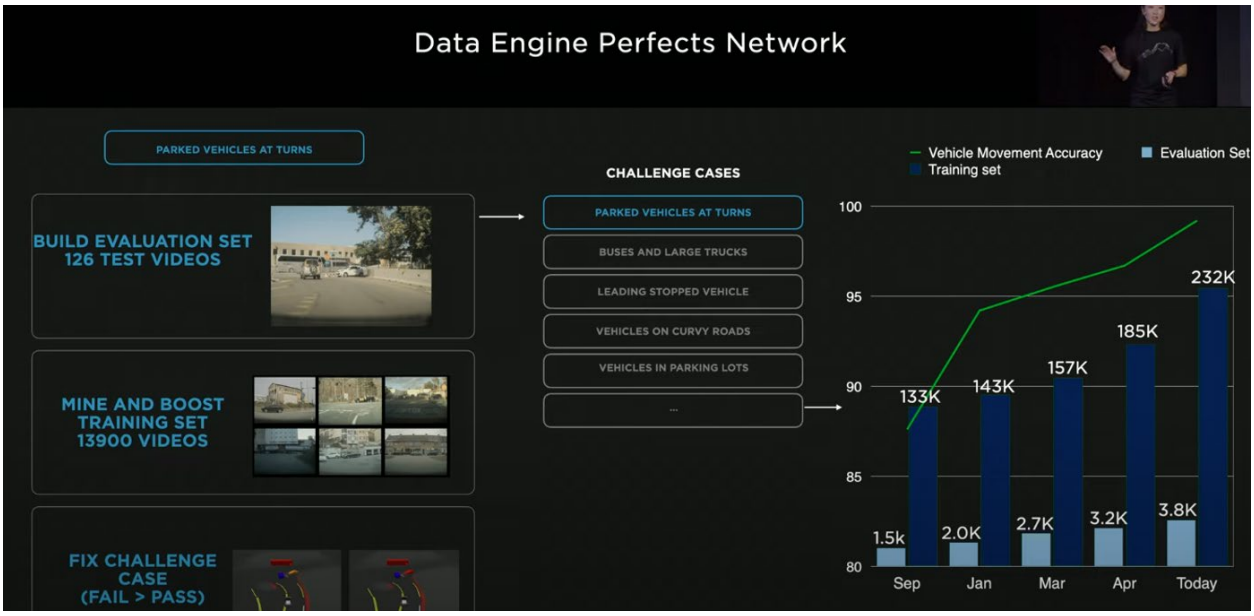
105. On information and belief, Tesla generates training data from the plurality of images, the generating comprising receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image. Tesla performs this step as described in the paragraph above.

106. On information and belief, Tesla generates training data from the plurality of images, the generating comprising generating summary statistics describing the state of mind of

the user in the image based on the received responses from the plurality of human observers. At its datacenters (e.g., Dojo and/or Cortex), Tesla generates a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images. With each new user response, the weight of the statistical summary describing the state of minds of road users in the plurality of images is modified, such that the accuracy of the movement by the autonomous vehicle improves with more responses and updated statistical summaries.



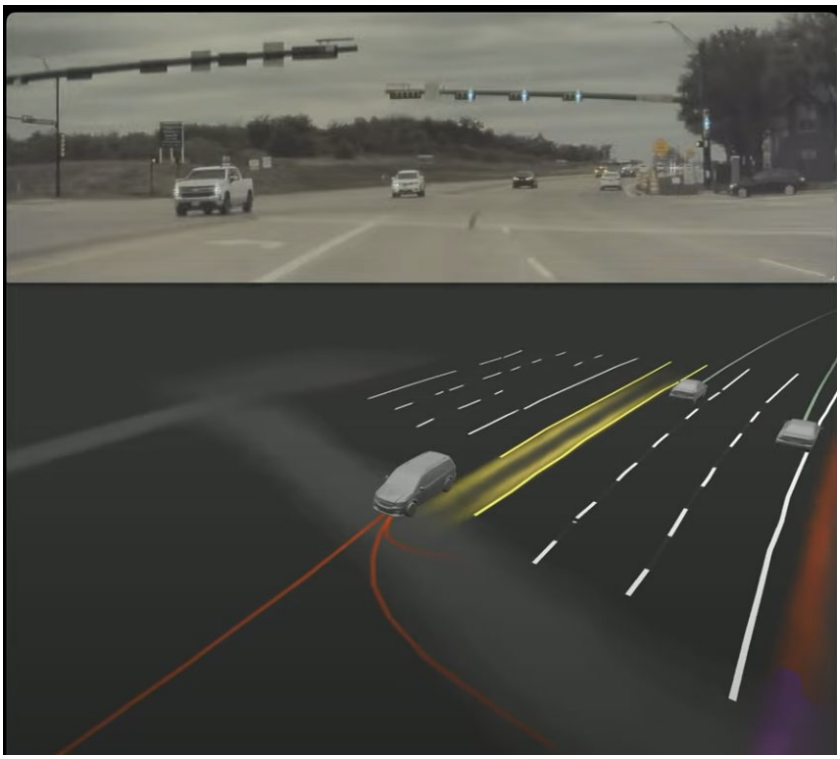
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).



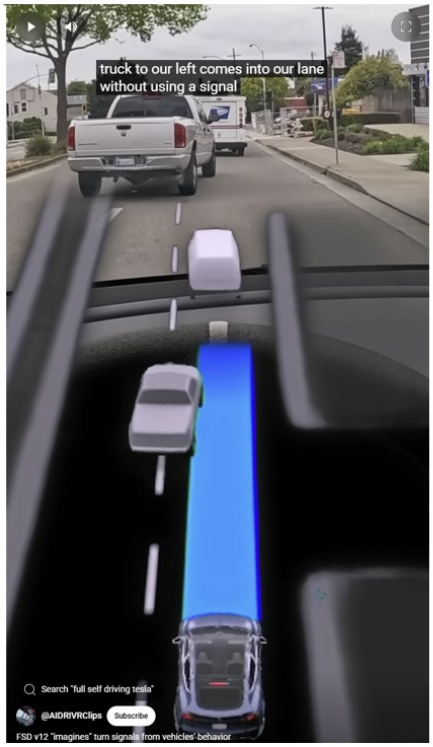
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

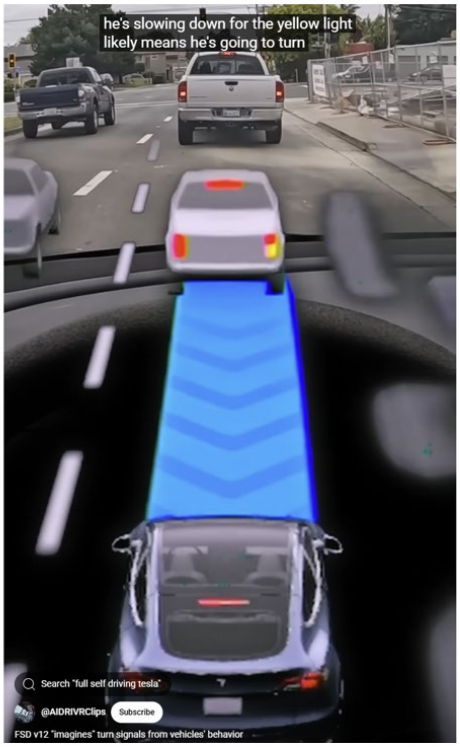
107. On information and belief, Tesla generates training data from the plurality of images, the generating comprising storing the summary statistics in association with the image as part of the training data. Tesla performs this step at its AI data centers, where the summary statistics associated with the image (or video compromising the image(s)) are stored with the image (or with a video comprising the image(s)) as part of the training data.

108. On information and belief, Tesla trains a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image. Tesla uses the training data set to train the FSD software. This is evidenced by the fact that the FSD software predicts actions based on the possible state of mind of road users.

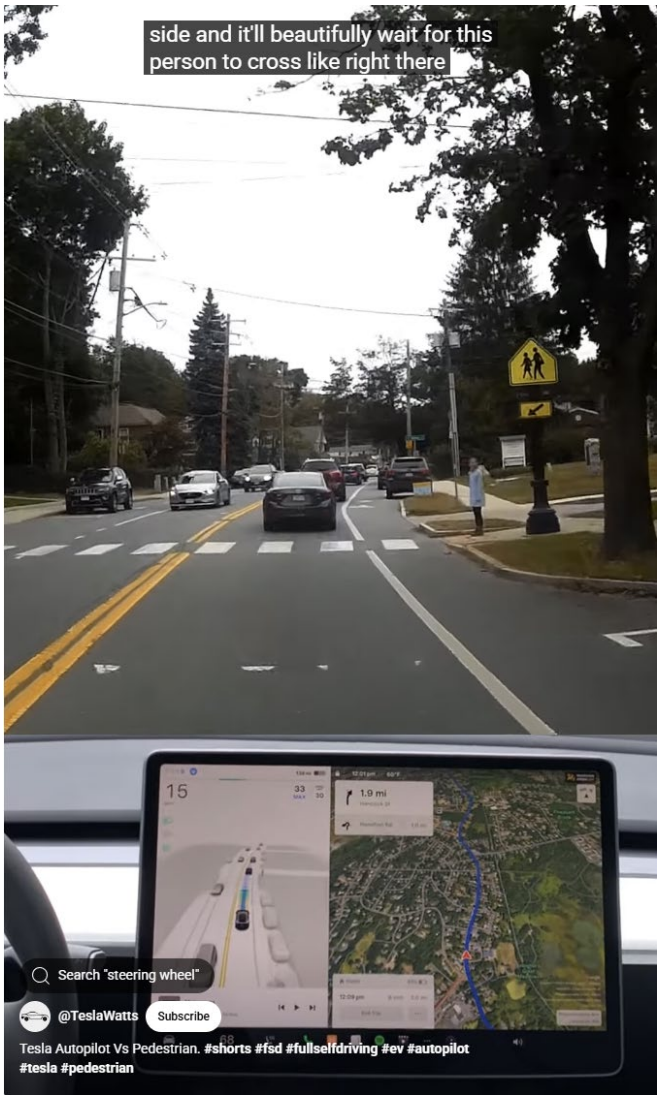


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).

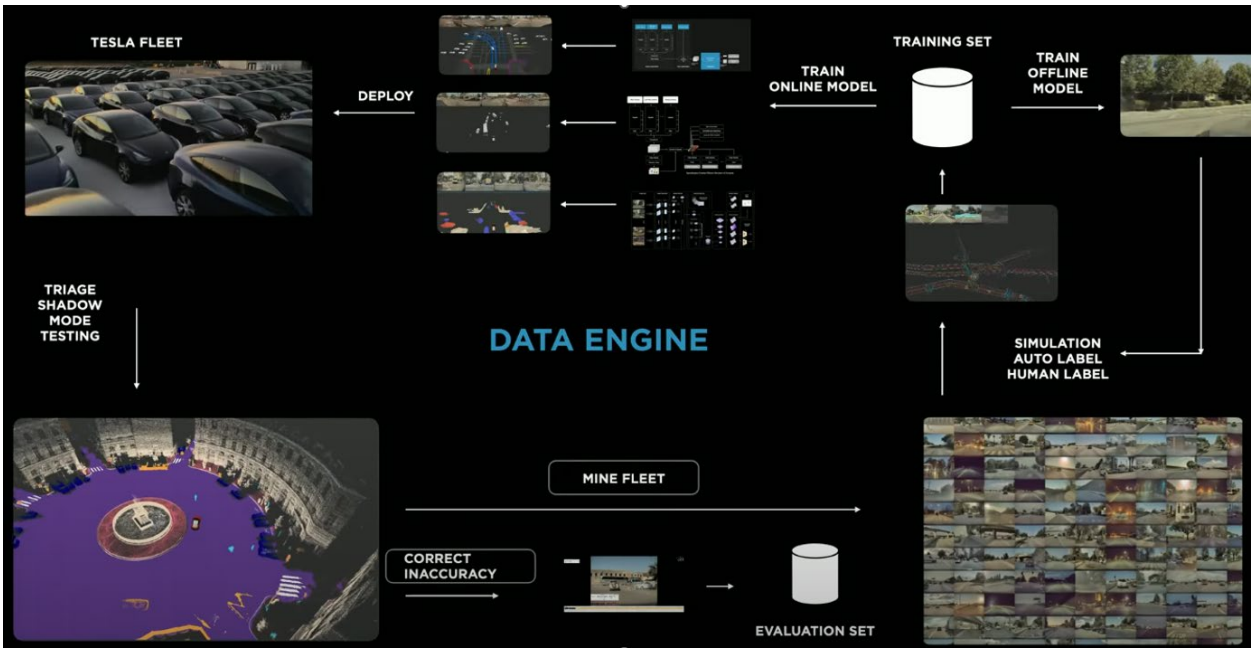




https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand).



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

109. On information and belief, Tesla executes the trained model to predict a state of mind of a user in a new image. For example, the FSD software allows for autonomous operation of the vehicle, in which the Tesla vehicle continuously receives new images and predicts the state of mind of the users in such images. *See* https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery").

110. The specific ways in which the '046 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the '046 Accused Products.

111. The technology discussion above and the exemplary '046 Accused Products provide context for Plaintiff's infringement allegations.

112. The claims of the '046 patent are patent eligible under 35 U.S.C. § 101. The '046 patent is not directed to an ineligible abstract idea. For example, it is not a mathematical algorithm executed on a generic computer or a fundamental economic business practice. The claims of the

’046 patent are directed to specific technological advancements for predicting the behavior of road users are directed to specific technological advancements for predicting the behavior of road users near the autonomous vehicle in a way that more closely resembles how human drivers would predict their behavior. ’046 patent at 3:57-60. The specification of the ’046 patent explains that properly predicting the behavior of moving objects around the autonomous vehicle is necessary for safely controlling an autonomous vehicle to avoid hitting other objects or people. *Id.* at 33-43. Conventional methods for autonomous vehicles control, however, do not predict a moving object’s actions or movements based on other observations besides the object’s past movements, which lead to inferior results in predicting the object’s future behavior. *Id.* at 1:50. For example, conventional methods for controlling an autonomous vehicle could not reliably anticipate whether a person walking on a sidewalk will cross the street, whether another person will remain standing on a street corner, and whether another person will change lanes on his or her bicycle. *Id.* at 33-43. The ’046 patent provides several technical features that embody a technical solution to the problems of conventional methods. For example, claim 1 of the ’046 patent recites a technological process that trains a model, using training data generated from summary statistics describing the state of mind of users (*e.g.*, user predictions for how the road user will behave, such as whether the road user will move a certain direction or stay in place) in an image, that is configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image. *Id*. at 15:44-62. The technology process of claim 1 then executes the trained model to predict a state of mind of a user in a new image. *Id*. at 15:64-64; *see also Id*. at 7:44-50 (“The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles … that operate on roadways by allowing them to make judgments about the future

behavior of road users based on their state of mind."). Accordingly, claim 1 of the '046 patent provides detailed technical requirements for how an improved technological process creates the improved result for controlling the operation of an autonomous vehicle. *Id.* 13:24-33 ("These summary statistics are an estimate of what the summary statistics would be for a collection of human observers who were shown [the object on the road]. The estimates summary statistics are therefore the system's best answer to the question 'does this cyclist intend to enter the path of the vehicle.' The vehicle is therefore able to make a guess 1006 about the intention of the cyclist that is closely matched to the guess that a human driver would make in that same situation."). The claims of the '046 patent are directed at specific asserted improvements in computer functionalities, specifically to autonomous vehicles, and not directed to abstract ideas. Further, as shown above, the ordered combination of the various claim elements of the claims of the '046 patent results in an unconventional manner result that is highly beneficial to autonomous vehicles—e.g., operation of an autonomous vehicle that more accurately predicts the behavior of pedestrians, bicycles, and other vehicles. The claims of the '046 patent encompass a "technology-based solution" to a problem that is unique to the operations of autonomous vehicles and are therefore patent eligible.

113. At a minimum, Tesla has known about the '046 patent and its infringement of the '046 patent at least as early as the filing date of the Complaint. Further, on information and belief, Tesla's conduct before the USPTO provides that Tesla was aware of the '046 patent and its infringement prior to the filing of the Complaint. For example, in prosecuting U.S. Patent No. 11,157,441, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,409,692, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 10,671,349, Tesla has known of the '046 patent. In another example, in prosecuting

U.S. Patent No. 11,893,393, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 12,307,350, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,561,791, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,215,999, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,361,457, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,636,333, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,562,231, Tesla has known of the ’046 patent. In another example, in prosecuting European Patent Application Publication No. 3864573, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,196,678, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,816,585, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,537,811, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,610,117, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 10,997,461, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,150,664, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 11,567,514, Tesla has known of the ’046 patent. In another example, in prosecuting U.S. Patent No. 10,956,755, Tesla has known of the ’046 patent. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of this Complaint.

114. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla has actively induced, under U.S.C. § 271(b), its distributors, customers, testing outfits, subsidiaries, importers, and/or consumers to directly infringe one or

more claims of the ’046 patent by using and/or testing the ’046 Accused Products. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’046 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the ’046 Accused Products, creating and/or maintaining established distribution channels for the ’046 Accused Products into and within the United States, manufacturing the ’046 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the ’046 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

115. On information and belief, despite having knowledge of the ’046 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the ’046 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla’s infringing activities relative to the ’046 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

116. Perceptive has been damaged as a result of Tesla’s infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive

for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

CONCLUSION

117. Plaintiff is entitled to recover from Tesla the damages sustained by Plaintiff as a result of Tesla's wrongful acts, and willful infringement, in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court.

118. Plaintiff has incurred and will incur attorneys' fees, costs, and expenses in the prosecution of this action. The circumstances of this dispute may give rise to an exceptional case within the meaning of 35 U.S.C. § 285, and Plaintiff is entitled to recover its reasonable and necessary attorneys' fees, costs, and expenses.

119. Plaintiff has complied with the requirements of 35 U.S.C. § 287, to the extent necessary and/or applicable, and is entitled to collect pre- and post-filing damages for Defendant's infringements of the Asserted Patents.

JURY DEMAND

120. Plaintiff hereby requests a trial by jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

PRAYER FOR RELIEF

121. Plaintiff respectfully requests that the Court find in its favor and against Tesla, and that the Court grant Plaintiff the following relief:

1. A judgment that Tesla has directly and/or indirectly infringed the Asserted Patents either literally and/or under the doctrine of equivalents;

2. A judgment that Tesla account for and pay to Plaintiff all damages and costs incurred by Plaintiff because of Tesla's infringing activities and other conduct complained of herein, including an accounting for any sales or damages not presented at trial;
3. A judgment and order requiring Tesla to pay Plaintiff damages under 35 U.S.C. § 284, including up to treble damages as provided by 35 U.S.C. § 284, and any royalties determined to be appropriate;
4. A judgment that Tesla account for and pay to Plaintiff a reasonable, ongoing, post judgment royalty because of Tesla's infringing activities, including continuing infringing activities, and other conduct complained of herein.
5. A judgment and order requiring Tesla to pay Plaintiff pre-judgment and post-judgment interest on the damages awarded;
6. A judgment and order finding this to be an exceptional case and requiring Tesla to pay the costs of this action (including all disbursements) and attorneys' fees as provided by 35 U.S.C. § 285; and
7. Such other and further relief as the Court deems just and equitable.

Dated: July 23, 2025

Respectfully submitted,

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