

**Exhibit 1 to
Intellectual Ventures II LLC's
Preliminary Infringement Contentions**

**Infringement Claim Chart of
U.S. Patent No. 7,336,805 (the “’805 Patent”)**

The Accused Instrumentalities include, without limitation, Tesla automotive vehicles (*e.g.*, Tesla Model X, S, 3, Y, Semi, Roadster Second Generation, and Cybertruck) that are equipped with Autopilot technology, and all past, current and future Tesla products that operate in the same or substantially similar manner as the specifically identified products and components, and all past, current and future Tesla products that have the same or substantially similar features as the specifically identified products and components (“Count I Automotive Vehicles” or “Tesla Automotive Vehicles”).

Plaintiff Intellectual Ventures II LLC (“IV” or “Plaintiff”) does not intend this exemplary claim chart to be limiting, and IV reserves its rights to pursue other accused instrumentalities, patent claims, evidence, and infringement arguments in this case. Discovery has yet to begin and this case is still in its initial stages. Accordingly, IV reserves the right to amend and/or supplement these contentions to the full extent allowed by the Court, including but not limited to, incorporating additional information, claims, theories, and / or accused products.

IV contends that Tesla, including Tesla’s employees, directly infringes each of the Asserted Claims, either literally or under the doctrine of equivalents. IV also contends that Tesla has indirectly infringed and continues to indirectly infringe by contributing to and actively inducing customers to use the Tesla vehicles and providing product manuals¹ that provide instructions regarding how to use Tesla vehicles in an infringing manner. Tesla also infringes via contributory infringement by providing replacement parts to Tesla vehicles and repair facilities by least making components that suitable for direct infringement that do not have any substantial non-infringing use.

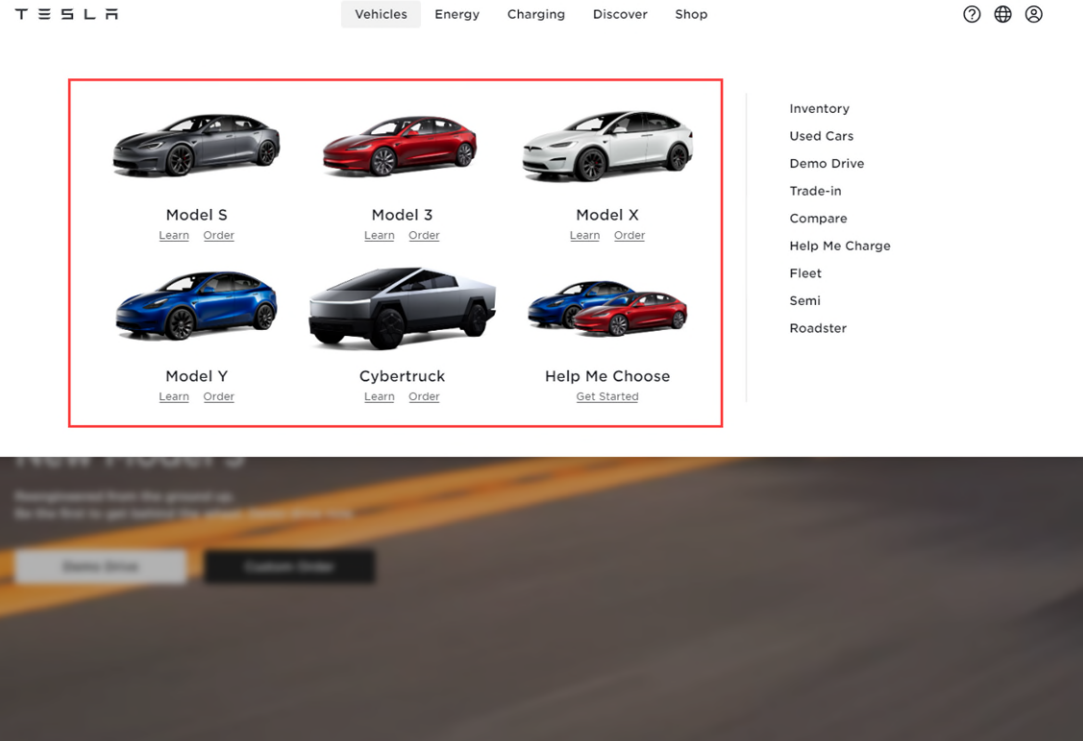
Tesla makes, uses, sells, offers for sale, and /or imports the Tesla Count I Automobiles. For example, on information and belief, Tesla makes Tesla Count I Automobiles, including at least in its Fremont, California; Lathrop, California; Grand Rapids, Michigan; Storey County, Nevada; Buffalo, New York; Brooklyn Park, Minnesota; Elgin, Illinois; and Austin, Texas manufacturing facilities. Further, Tesla sells and/or offers for sale the Tesla Count I Automobiles in the United States through its sales centers.

¹ See, for example, www.tesla.com/ownersmanual, www.tesla.com/support (last accessed on July 31, 2024).

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>1. A method for assisting guidance of a motor vehicle on the basis of image data, the method comprising:</p>	<p>To the extent the preamble is limiting, on information and belief, the Tesla Automotive Vehicles perform a method for assisting guidance of a motor vehicle on the basis of image data.</p>  <p>The image is a promotional graphic for Tesla's 'Future of Driving'. It features a silver Tesla car centered against a dark blue background with geometric, low-poly shapes. Below the car, the text reads: 'Future of Driving', 'Tesla cars come standard with advanced hardware capable of providing Autopilot features and full self-driving capabilities—through software updates designed to improve functionality over time.', and 'Tesla's Autopilot AI team drives the future of autonomy of current and new generations of vehicles. Learn about the team and apply to help accelerate the world with full self-driving.' The word 'Autopilot' is highlighted with a red box in the original image.</p> <p>Source: https://www.tesla.com/autopilot (last accessed on April 10, 2024).</p> <ul style="list-style-type: none"> • Auto Lane Change: When you engage a turn signal while Autosteer is active, Auto Lane Change moves Model 3 into the adjacent lane in the direction indicated by the turn signal (see Auto Lane Change). <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>

Claim 1

Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805



Source: <https://www.tesla.com/> (last accessed on April 10, 2024).

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<h2>Autopilot and Full Self-Driving Capability</h2> <p>Autopilot is an advanced driver assistance system that enhances safety and convenience behind the wheel. When used properly, Autopilot reduces your overall workload as a driver. Each new Tesla vehicle is equipped with multiple external cameras and powerful vision processing to provide an additional layer of safety. All vehicles built for the North American market now use our camera-based Tesla Vision to deliver Autopilot features, rather than radar.</p> <p>Autopilot comes standard on every new Tesla. For owners who took delivery of their vehicle without Autopilot, there are multiple packages available for purchase, depending on when your vehicle was built: Autopilot, Enhanced Autopilot and Full Self-Driving Capability.</p> <p>Source: https://www.tesla.com/support/autopilot (last accessed on April 10, 2024).</p>
1[a] acquired image data using an imaging sensor from a surrounding field of the motor vehicle;	On information and belief, the Tesla Automotive Vehicles perform the step of acquiring image data using an imaging sensor from a surrounding field of the motor vehicle.

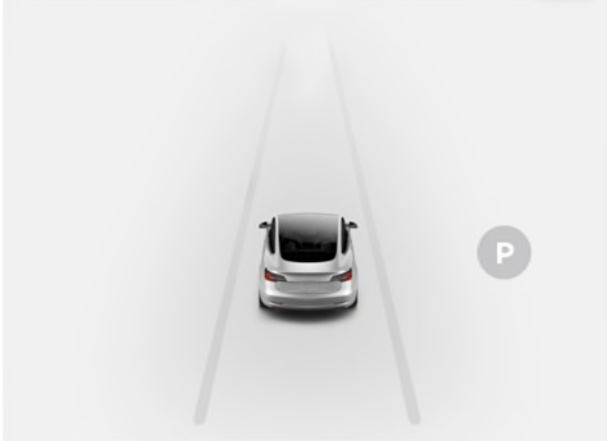
Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <h3 style="text-align: center;">Advanced Sensor Coverage</h3> <p style="text-align: center;">Eight cameras and powerful vision processing provide 360 degrees of visibility at up to 250 meters of range.</p> <p>The diagram illustrates the sensor coverage of a Tesla vehicle, showing eight cameras providing 360 degrees of visibility. The coverage is represented by colored segments around a central point, with labels for each camera type and its maximum range:</p> <ul style="list-style-type: none"> Rearward Looking Side Cameras: Max distance 100m Wide Forward Camera: Max distance 60m Main Forward Camera: Max distance 150m Narrow Forward Camera: Max distance 250m Forward Looking Side Cameras: Max distance 80m Rear View Camera: Max distance 50m </div> <p>Source: https://www.tesla.com/autopilot (last accessed on April 10, 2024).</p> <p>For example, on information and belief, the Tesla Automotive Vehicles include cameras with related components (e.g., optical components such as lenses and image sensors) that are used to acquire image data from the surrounding environment.</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	 <p>Source: https://www.tesla.com/autopilot (last accessed on April 10, 2024).</p>
1[b] extracting from the acquired image data positional parameters of at least one potential destination relative to the motor vehicle; and	<p>On information and belief, the Tesla Automotive Vehicles perform the step of extracting from the acquired image data positional parameters of at least one potential destination relative to the motor vehicle.</p> <p>On information and belief, the positional parameters for the adjacent lane is the position of adjacent lane relative to the vehicle. The positional parameters change in real time as the Tesla Automotive Vehicles perform the move into the adjacent lane. On information and belief, Autopark infringes for similar reasons.</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805																				
	<p>Tesla Hardware 3 vs Hardware 4 Differences</p> <p>Here's a quick comparison showing the differences between Tesla HW3 vs HW4. In a nutshell, Hardware 4 has a faster FSD Computer and upgraded sensors, including better cameras and a new, more precise radar.</p> <table> <tr> <th>HW3 (& FSD Computer 1)</th><th>HW4 (& FSD Computer 2)</th></tr> <tr> <td>Samsung Exynos-IP Based</td><td>Samsung Exynos-IP Based</td></tr> <tr> <td>12 CPU Cores</td><td>20 CPU Cores</td></tr> <tr> <td>CPU Frequency: 2.2 Ghz</td><td>CPU Frequency: 2.35 Ghz</td></tr> <tr> <td>2 Neural Network (NN) Processors</td><td>3 Neural Network (NN) Processors</td></tr> <tr> <td>NN Processor Frequency: 2.0 Ghz</td><td>NN Processor Frequency: 2.2 Ghz</td></tr> <tr> <td>14 nm Process</td><td>Estimated TSMC's 7nm or N4 (4nm class)</td></tr> <tr> <td>36 TOPS</td><td>50 TOPS</td></tr> <tr> <td>1.2MP cameras around the car</td><td>5MP cameras around the car</td></tr> <tr> <td>Radar previously used was Continental's ARS410 with a range of 160 meters. Discontinued in 2021.</td><td>Speculated to be the Arbe Phoenix radar unit with greater detail and a 300 meter range.</td></tr> </table> <p>Source: https://www.autopilotreview.com/tesla-hardware-4-rolling-out-to-new-vehicles/ (last accessed on April 10, 2024).</p>	HW3 (& FSD Computer 1)	HW4 (& FSD Computer 2)	Samsung Exynos-IP Based	Samsung Exynos-IP Based	12 CPU Cores	20 CPU Cores	CPU Frequency: 2.2 Ghz	CPU Frequency: 2.35 Ghz	2 Neural Network (NN) Processors	3 Neural Network (NN) Processors	NN Processor Frequency: 2.0 Ghz	NN Processor Frequency: 2.2 Ghz	14 nm Process	Estimated TSMC's 7nm or N4 (4nm class)	36 TOPS	50 TOPS	1.2MP cameras around the car	5MP cameras around the car	Radar previously used was Continental's ARS410 with a range of 160 meters. Discontinued in 2021.	Speculated to be the Arbe Phoenix radar unit with greater detail and a 300 meter range.
HW3 (& FSD Computer 1)	HW4 (& FSD Computer 2)																				
Samsung Exynos-IP Based	Samsung Exynos-IP Based																				
12 CPU Cores	20 CPU Cores																				
CPU Frequency: 2.2 Ghz	CPU Frequency: 2.35 Ghz																				
2 Neural Network (NN) Processors	3 Neural Network (NN) Processors																				
NN Processor Frequency: 2.0 Ghz	NN Processor Frequency: 2.2 Ghz																				
14 nm Process	Estimated TSMC's 7nm or N4 (4nm class)																				
36 TOPS	50 TOPS																				
1.2MP cameras around the car	5MP cameras around the car																				
Radar previously used was Continental's ARS410 with a range of 160 meters. Discontinued in 2021.	Speculated to be the Arbe Phoenix radar unit with greater detail and a 300 meter range.																				

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <h2>Autopilot Features</h2> </div> <div> <p>This topic describes how to enable and use the following driver assistance features.</p> </div> <div> <p>Note <i>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with the following features, or a feature may not operate exactly as described.</i></p> </div> <div> <ul style="list-style-type: none"> • Traffic-Aware Cruise Control: Like traditional cruise control, Traffic-Aware Cruise Control maintains a set driving speed. However, Traffic-Aware Cruise Control also slows down or accelerates Model 3 as needed to maintain the following distance from the vehicle in front of you. While Traffic-Aware Cruise Control is engaged, you are still responsible for steering Model 3 (see Traffic-Aware Cruise Control). • Autosteer: Like Traffic-Aware Cruise Control, Autosteer maintains a set speed (if there is not a vehicle in front of you) or a set following distance (if there is a vehicle in front of you). In addition, Autosteer detects lane markings, road edges, and the presence of vehicles and objects to intelligently keep Model 3 in its driving lane (see Autosteer). </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div> <div> <ul style="list-style-type: none"> • Auto Lane Change: When you engage a turn signal while Autosteer is active, Auto Lane Change moves Model 3 into the adjacent lane in the direction indicated by the turn signal (see Auto Lane Change). </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div>

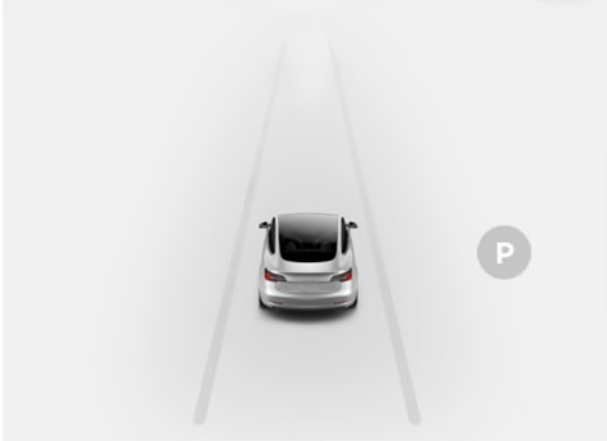
Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <h2>Autopark</h2> </div> <div> <p>This feature may be temporarily limited or inactive until it is enabled with a future software update for vehicles manufactured as of approximately September 2023.</p> </div> <div>  </div> <div> <p>Note</p> </div> <div> <p><i>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Autopark.</i></p> </div> <div> <p>Autopark uses data to simplify parking on public roads by maneuvering Model 3 into parallel and perpendicular parking spaces.</p> </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>To Use Autopark</p> <p>When driving, follow these steps to allow Autopark to maneuver Model 3 into a parking space:</p> <ol style="list-style-type: none"> 1. While driving slowly, monitor the touchscreen to see potential parking spaces detected by Autopilot. When Model 3 is positioned such that it can reverse into one of the detected locations, the touchscreen displays a parking icon.  <p>Note The parking icon appears only if the vehicle's position and/or the circumstances of the surrounding area are such that Autopark can determine an appropriate driving path. If Autopark cannot determine an appropriate path (for example, when driving on a narrow street where moving into the parking space causes the front of the vehicle to extend into the adjacent lane), you can either reposition the vehicle, find a different parking space, or park manually.</p> <ol style="list-style-type: none"> 2. Choose a spot, check to determine if it is appropriate and safe, then pull forward and stop approximately one car length ahead of the parking space (as you normally would when parallel parking or when backing into a perpendicular parking space). 3. Release the steering wheel, then touch and hold Autopark in the drive mode strip on the touchscreen. You can release the button once Autopark engages. 4. Autopark displays a message when parking is complete. <p>If you press the brake pedal when Autopark is actively parking Model 3, the parking process pauses until you touch Resume on the touchscreen.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>
1[c] calculating at least one trajectory describing an optimized travel	On information and belief, the Tesla Automotive Vehicles perform the step of calculating at least one trajectory describing an optimized travel path using the positional parameters so as to assist a subsequent vehicle guidance for at least one of the potential destinations.

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>path using the positional parameters so as to assist a subsequent vehicle guidance for at least one of the potential destinations,</p>	<p>On information and belief, potential destinations include lane changes and freeway exits. Autopilot guides the vehicle towards the potential destinations. On information and belief, Autopark infringes for similar reasons.</p> <p>Autopilot Features</p> <p>This topic describes how to enable and use the following driver assistance features.</p> <div> <p>Note Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with the following features, or a feature may not operate exactly as described.</p> </div> <ul style="list-style-type: none"> • Traffic-Aware Cruise Control: Like traditional cruise control, Traffic-Aware Cruise Control maintains a set driving speed. However, Traffic-Aware Cruise Control also slows down or accelerates Model 3 as needed to maintain the following distance from the vehicle in front of you. While Traffic-Aware Cruise Control is engaged, you are still responsible for steering Model 3 (see Traffic-Aware Cruise Control). • Autosteer: Like Traffic-Aware Cruise Control, Autosteer maintains a set speed (if there is not a vehicle in front of you) or a set following distance (if there is a vehicle in front of you). In addition, Autosteer detects lane markings, road edges, and the presence of vehicles and objects to intelligently keep Model 3 in its driving lane (see Autosteer). <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> <ul style="list-style-type: none"> • Auto Lane Change: When you engage a turn signal while Autosteer is active, Auto Lane Change moves Model 3 into the adjacent lane in the direction indicated by the turn signal (see Auto Lane Change). <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> <p>On information and belief, a processor in the Tesla Automotive Vehicles calculates an optimized trajectory based on the position of the destination relative to the vehicle. For example, the diagram below shows two trajectories including a lane change and a freeway exit. The diagram further below shows the location in the adjacent lane that the trajectory will take the vehicle to.</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div>  </div> <div> <p>PyTorch at Tesla - Andrej Karpathy, Tesla</p> <div>  <div> PyTorch 43.3K subscribers </div> <div> Subscribe </div> </div> <div> <div>  11K </div> <div>  </div> <div>  Share </div> <div>  </div> </div> <div> <p>502K views 4 years ago PyTorch Developer Conference 2019</p> <p>Hear from Andrej Karpathy on how Tesla is using PyTorch to develop full self-driving capabilities for its vehicles, including AutoPilot and Smart Summon. ...more</p> </div> </div> <p>Source: https://www.youtube.com/watch?v=oBklItKXtDE&feature=youtu.be&t=91 at 0:59 (last accessed on April 10, 2024).</p>

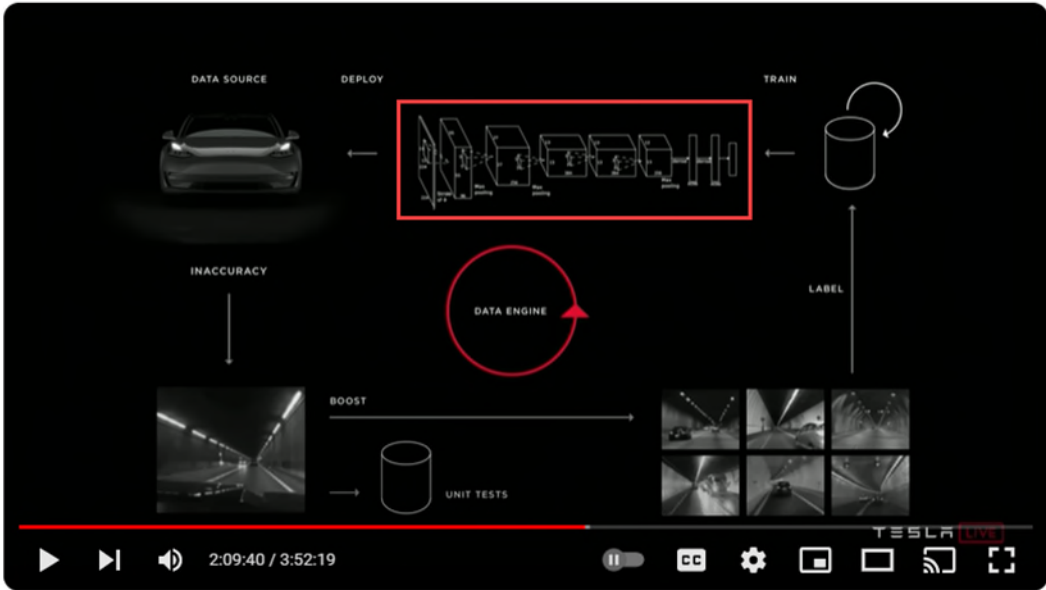
Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>As Model 3 changes lanes, it is important to monitor its performance by watching the driving path in front of you and the surrounding area. Stay prepared to take over steering at any time. As you are crossing over into the adjacent lane, the touchscreen displays the location in the lane that Model 3 is moving into.</p>  <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> <h2>Autopark</h2> <p>This feature may be temporarily limited or inactive until it is enabled with a future software update for vehicles manufactured as of approximately September 2023.</p> <div> <p>Note <i>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Autopark.</i></p> </div> <p>Autopark uses data to simplify parking on public roads by maneuvering Model 3 into parallel and perpendicular parking spaces.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>To Use Autopark</p> <p>When driving, follow these steps to allow Autopark to maneuver Model 3 into a parking space:</p> <ol style="list-style-type: none"> 1. While driving slowly, monitor the touchscreen to see potential parking spaces detected by Autopilot. When Model 3 is positioned such that it can reverse into one of the detected locations, the touchscreen displays a parking icon.  <p>Note The parking icon appears only if the vehicle's position and/or the circumstances of the surrounding area are such that Autopark can determine an appropriate driving path. If Autopark cannot determine an appropriate path (for example, when driving on a narrow street where moving into the parking space causes the front of the vehicle to extend into the adjacent lane), you can either reposition the vehicle, find a different parking space, or park manually.</p> <ol style="list-style-type: none"> 2. Choose a spot, check to determine if it is appropriate and safe, then pull forward and stop approximately one car length ahead of the parking space (as you normally would when parallel parking or when backing into a perpendicular parking space). 3. Release the steering wheel, then touch and hold Autopark in the drive mode strip on the touchscreen. You can release the button once Autopark engages. 4. Autopark displays a message when parking is complete. <p>If you press the brake pedal when Autopark is actively parking Model 3, the parking process pauses until you touch Resume on the touchscreen.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>
1[d] wherein the extracting includes: performing an edge detection and edge	On information and belief, the Tesla Automotive Vehicles perform the extracting step including performing an edge detection and edge segmentation on the image data so as to break down the image data into a plurality of edge segments and storing interrelationships of the plurality of edge segments in a mathematical

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>segmentation on the image data so as to break down the image data into a plurality of edge segments and storing interrelationships of the plurality of edge segments in a mathematical tree structure;</p>	<p>tree structure.</p> <p>On information and belief, the screenshot below demonstrates Autopilot has detected the lane markings including the lane markings of the adjacent lane and represents lane markings as a plurality of edge segments. On information and belief, Autopark infringes for similar reasons.</p> <div> <p>The screenshot shows a first-person view from a vehicle's perspective. The road ahead is a two-lane road with white lane markings. A red 'STOP' sign is visible in the distance. The interface includes various overlays: a speedometer on the left, a 'STOP' sign icon in the center, and a 'MAIN' label at the bottom left. The lane markings are highlighted with green and yellow lines, indicating the system's detection of the road boundaries.</p> </div> <p>Neural Networks</p> <p>Apply cutting-edge research to train deep neural networks on problems ranging from perception to control. Our per-camera networks analyze raw images to perform semantic segmentation, object detection and monocular depth estimation. Our birds-eye-view networks take video from all cameras to output the road layout, static infrastructure and 3D objects directly in the top-down view. Our networks learn from the most complicated and diverse scenarios in the world, iteratively sourced from our fleet of millions of vehicles in real time. A full build of Autopilot neural networks involves 48 networks that take 70,000 GPU hours to train 🔥. Together, they output 1,000 distinct tensors (predictions) at each timestep.</p> <p>Source: https://www.tesla.com/AI (last accessed on April 10, 2024).</p> <p>On information and belief, the autopilot image processing algorithms identify a plurality of edge segments that are stored in a manner or arrangement that defines the interrelationships between the plurality of edge segments. The arrangement is realized through a mathematical tree structure.</p>

Claim 1

Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805



Tesla Autonomy Day



Tesla 2.61M subscribers

Subscribe

64K



Share



6.3M views Streamed 4 years ago

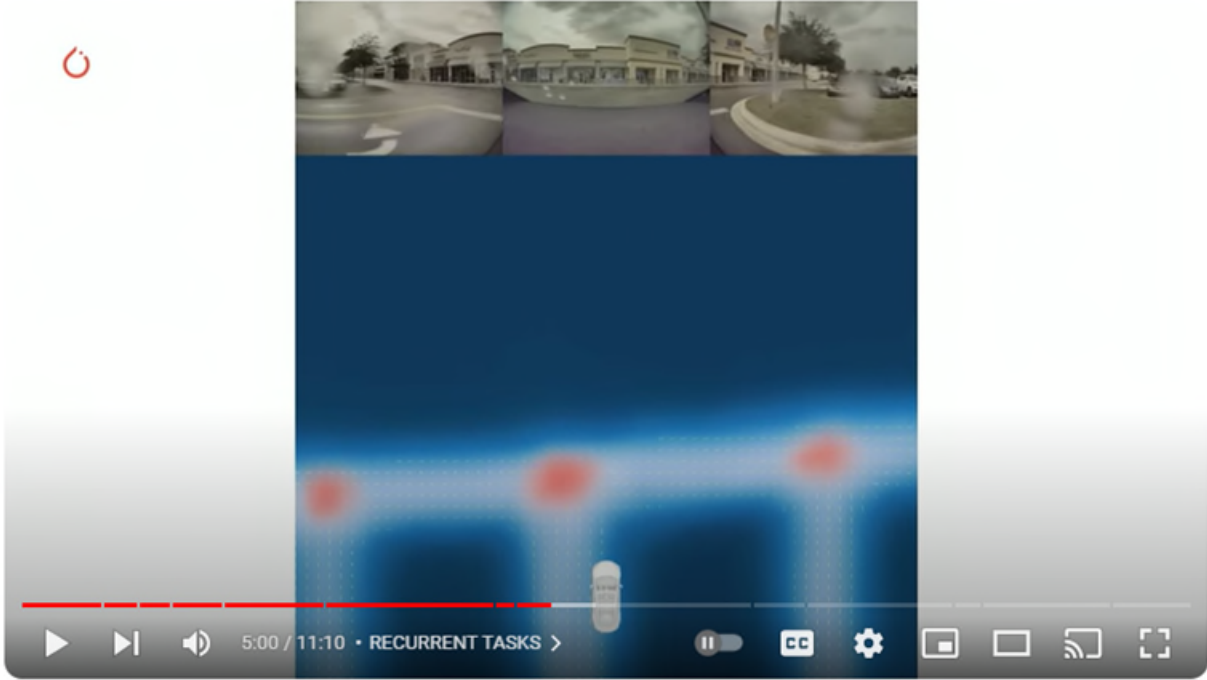
Tesla Autonomy Day is on Mon, April 22nd – watch the event livestream @11am PDT ...more

Source: <https://youtu.be/Ucp0TTmvqOE?t=7784> at 2:09:44 (last accessed on April 10, 2024).



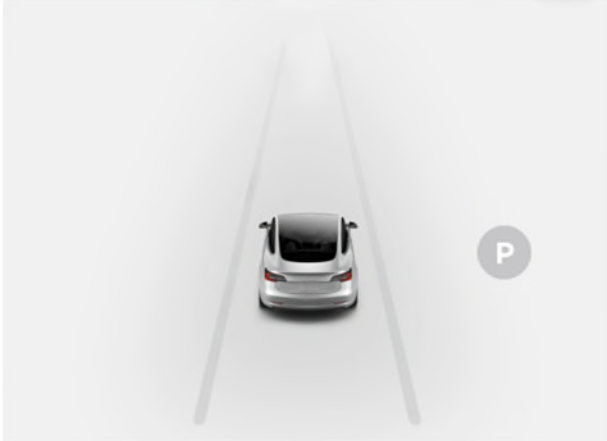
Neural Networks

Apply cutting-edge research to train deep neural networks on problems ranging from perception to control. Our per-camera networks analyze raw images to perform semantic segmentation, object detection and monocular depth estimation. Our birds-eye-view networks take video from all cameras to output the road layout, static infrastructure and 3D objects directly in the top-down view. Our networks learn from the most complicated and diverse scenarios in the world, iteratively sourced from our fleet of millions of vehicles in real time. A full build of Autopilot neural networks involves 48 networks that take 70,000 GPU hours to train. Together, they output 1,000 distinct tensors (predictions) at each timestep.

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>Source: https://www.tesla.com/AI (last accessed on April 10, 2024).</p> <p>On information and belief, the neural network stores the interrelationship of a plurality of edge segments in a mathematical tree structure within the network.</p>  <p>(Transcription of video)</p> <p>“So this is an example of what a road layout prediction might look like for the Autopilot. Here we are</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>plugging in three cameras simultaneously into a neural network and <u>the network's predictions are not anymore in the image space, they are in the top-down space</u>. So we're looking at the predictions of this network, in particular, here we are showing <u>some of the predictions related to the corridors that are available in this parking lot, where the intersections are</u> and what the orientation is of all of these things are. And so the stitching up now, it doesn't happen sort of in the C++ code base, <u>the stitching up across space and time happens inside the recurrent neural network</u>. So more generally what our networks start to look like for all of these different tasks and what we're converging on, is it looks something like this. We have eight hydranets for the eight tasks.”</p> <p>Source: https://www.youtube.com/watch?v=oBklltKXtDE at approximately 5:00 (emphasis added) (last accessed on April 10, 2024).</p>
<p>1[e] analyzing the plurality of edge segments for the presence of a geometric object associated with a geometrical form that may at least partially describe a potential destination so as to identify one or more potential geometric objects;</p>	<p>On information and belief, the Tesla Automotive Vehicles perform the extracting step including analyzing the plurality of edge segments for the presence of a geometric object associated with a geometrical form that may at least partially describe a potential destination so as to identify one or more potential geometric objects.</p> <p>On information and belief, the potential destination is the adjacent lane which Autopilot may move into when making the automated lane change. Autopilot analyses the edge segments to determine the presence of a geometrical form corresponding to a lane marking. In order to compensate for variations in lane marking, e.g. worn or dirty markings, Autopilot has a minimum threshold to identify the lane markings for the adjacent lane, or the geometrical forms of the calculated lanes, which must at least partially describe the adjacent lane. On information and belief, Autopark infringes for similar reasons.</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <p>The image is a screenshot of a Tesla Autopark interface. It shows a first-person view from the driver's seat, looking out at a parking lot. A red octagonal 'STOP' sign is visible in the distance. The interface is overlaid with various data and sensor information. On the left side, there is a list of sensor data: 'Ego Speed: 20.75 MPH', 'Time: 1151.44133000', 'CAL P 0.60 Y 1.20 R 0.00 deg', 'Vision Eye: 18.29 Snow Eye: 18.75 Display Eye: 23.43', 'HL(0.00), EL(0.30), FL(0.31), FR(0.30), SC(0.00)', 'HPR: FLR(0.00), FRH(0.00)', '+0.0000 AUTO_HIGHBEAM', '+0.0000 BLINDED', '+0.0001 RAINING', '+0.0001 THE_SPRAY', '+0.0011 WIDE_ROAD', '+0.0000 RESTRICTED', and 'BUSSE CONTROLLED_ACCESS'. On the right side, there is a 'MAIN' label and a 'STOP' label. The bottom of the screen shows a 'MAIN' label and a 'STOP' label. The overall scene is a parking lot with several cars parked in the background.</p> </div> <p>Source: https://www.tesla.com/AI (last accessed on April 10, 2024).</p> <div> <h2>Autopark</h2> </div> <p>This feature may be temporarily limited or inactive until it is enabled with a future software update for vehicles manufactured as of approximately September 2023.</p> <div> <p>Note <i>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Autopark.</i></p> </div> <p>Autopark uses data to simplify parking on public roads by maneuvering Model 3 into parallel and perpendicular parking spaces.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>To Use Autopark</p> <p>When driving, follow these steps to allow Autopark to maneuver Model 3 into a parking space:</p> <ol style="list-style-type: none"> 1. While driving slowly, monitor the touchscreen to see potential parking spaces detected by Autopilot. When Model 3 is positioned such that it can reverse into one of the detected locations, the touchscreen displays a parking icon.  <p>Note The parking icon appears only if the vehicle's position and/or the circumstances of the surrounding area are such that Autopark can determine an appropriate driving path. If Autopark cannot determine an appropriate path (for example, when driving on a narrow street where moving into the parking space causes the front of the vehicle to extend into the adjacent lane), you can either reposition the vehicle, find a different parking space, or park manually.</p> <ol style="list-style-type: none"> 2. Choose a spot, check to determine if it is appropriate and safe, then pull forward and stop approximately one car length ahead of the parking space (as you normally would when parallel parking or when backing into a perpendicular parking space). 3. Release the steering wheel, then touch and hold Autopark in the drive mode strip on the touchscreen. You can release the button once Autopark engages. 4. Autopark displays a message when parking is complete. <p>If you press the brake pedal when Autopark is actively parking Model 3, the parking process pauses until you touch Resume on the touchscreen.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>
1[f] analyzing the one or more potential geometric objects for	On information and belief, the Tesla Automotive Vehicles perform the extracting step including analyzing the one or more potential geometric objects for plausibility using a matching algorithm so as to identify one or more plausible objects.

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>plausibility using a matching algorithm so as to identify one or more plausible objects;</p>	<p>An integral part of the autopilot system in Tesla's cars is a deep neural network that identifies lane markings in camera images. Neural networks "see" things much differently than we do, and it's not always obvious why, even to the people that create and train them. Usually, researchers train neural networks by showing them an enormous number of pictures of something (like a street) with things like lane markings explicitly labeled, often by humans. The network will gradually learn to identify lane markings based on similarities that it detects across the labeled dataset, but exactly what those similarities are can be very abstract.</p> <p>Source: https://spectrum.ieee.org/cars-that-think/transportation/self-driving/three-small-stickers-on-road-can-steer-tesla-autopilot-into-oncoming-lane (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>The initial step in Tencent's testing involved direct access to Tesla's software. Researchers showed the lane detection system a variety of digital images of lane markings to establish its detection parameters. As output, the system specified the coordinates of any lanes that it detected in the input image. By using "a variety of optimization algorithms to mutate the lane and the area around it," Tencent found several different types of "adversarial example[s] that [are similar to] the original image but can disable the lane recognition function." Essentially, Tencent managed to find the point at which the confidence threshold of Tesla's lane-detecting neural network goes from "not a lane" to "lane" or vice-versa, and used that as a reference point to generate the adversarial lane markings. Here are a few of them:</p> <p>Source: https://spectrum.ieee.org/cars-that-think/transportation/self-driving/three-small-stickers-on-road-can-steer-tesla-autopilot-into-oncoming-lane (last accessed on April 10, 2024).</p>

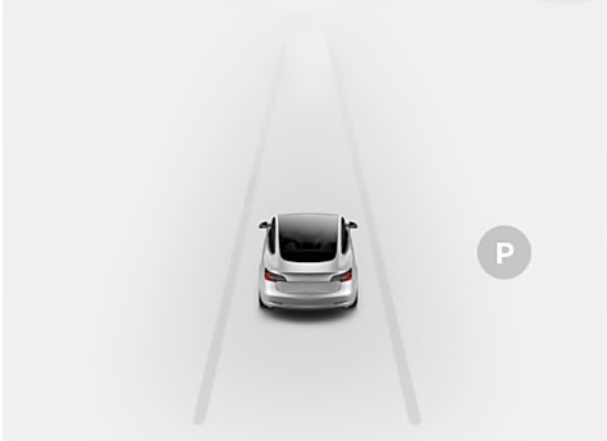
Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> </div> <p>Fig 29. Left picture shows we add some noise on the left lane line in digital level, and right picture shows the result of APE's lane recognition function. (We redact top left of our image for privacy reasons, but it won't affect the final result.)</p> <div> </div> <p>Fig 30. Left picture shows we add some patch around the left lane line in digital level, and right picture shows the result</p> <p>Source: https://spectrum.ieee.org/cars-that-think/transportation/self-driving/three-small-stickers-on-road-can-steer-tesla-autopilot-into-oncoming-lane (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> </div> <p>This Is What Tesla's Autopilot Sees On The Road</p> <div> Carscoops 69.4K subscribers Subscribe 1.1K Share Download ... </div> <div> <p>203,002 views Jan 31, 2020</p> <p>This video shows what Tesla Autopilot's neural network sees on the road. Tesla says the system relies on per-camera networks to analyze raw images to perform semantic segmentation, object detection and monocular depth estimation. It employs birds-eye-view networks to take a video from all cameras to output the road layout, static infrastructure and 3D objects directly in the top-down view.</p> </div> <p>Source: https://www.youtube.com/watch?v=fKXztwtXaGo at 0:04 (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	 <p>This Is What Tesla's Autopilot Sees On The Road</p> <p>Carscoops 69.4K subscribers</p> <p>Subscribe</p> <p>1.1K</p> <p>Share</p> <p>Download</p> <p>203,002 views Jan 31, 2020 This video shows what Tesla Autopilot's neural network sees on the road. Tesla says the system relies on per-camera networks to analyze raw images to perform semantic segmentation, object detection and monocular depth estimation. It employs birds-eye-view networks to take a video from all cameras to output the road layout, static infrastructure and 3D objects directly in the top-down view.</p> <p>Source: https://www.youtube.com/watch?v=fKXztwtXaGo at 0:18 (last accessed on April 10, 2024).</p>
1[g] performing an additional acceptance analysis so as to identify at least one accepted object, the additional acceptance analysis	<p>On information and belief, the Tesla Automotive Vehicles perform the extracting step including performing an additional acceptance analysis so as to identify at least one accepted object, the additional acceptance analysis including analyzing a shape of the image formation of each object in the image data based on knowledge of at least one imaging property of the imaging sensor relative to the surrounding field.</p> <p>On information and belief, Auto Lane Change carries out additional analysis to check each detected object in the image data to ensure there are no obstacles preventing the safe execution of a lane change.</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
including analyzing a shape of the image formation of each object in the image data based on knowledge of at least one imaging property of the imaging sensor relative to the surrounding field; and	<div> <h2>Autopilot Features</h2> </div> <div> <p>This topic describes how to enable and use the following driver assistance features.</p> </div> <div>  </div> <div> <p>Note</p> </div> <div> <p>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with the following features, or a feature may not operate exactly as described.</p> </div> <div> <ul style="list-style-type: none"> • Traffic-Aware Cruise Control: Like traditional cruise control, Traffic-Aware Cruise Control maintains a set driving speed. However, Traffic-Aware Cruise Control also slows down or accelerates Model 3 as needed to maintain the following distance from the vehicle in front of you. While Traffic-Aware Cruise Control is engaged, you are still responsible for steering Model 3 (see Traffic-Aware Cruise Control). • Autosteer: Like Traffic-Aware Cruise Control, Autosteer maintains a set speed (if there is not a vehicle in front of you) or a set following distance (if there is a vehicle in front of you). In addition, Autosteer detects lane markings, road edges, and the presence of vehicles and objects to intelligently keep Model 3 in its driving lane (see Autosteer). </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div> <div> <ul style="list-style-type: none"> • Auto Lane Change: When you engage a turn signal while Autosteer is active, Auto Lane Change moves Model 3 into the adjacent lane in the direction indicated by the turn signal (see Auto Lane Change). </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div> <div> <p>Traffic-Aware Cruise Control and Autosteer use information from the cameras on Model 3 to detect lane markings, road edges, and other vehicles and road users around Model 3.</p> </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div> <div> <p>When Autosteer is able to detect lane markings, it displays the edges of the driving lane in blue on the touchscreen.</p> </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>If you engage a turn signal while Autosteer is active, Model 3 moves into the adjacent lane in the direction indicated by the turn signal, provided the following conditions are met:</p> <ul style="list-style-type: none"> • The turn signal is engaged. • Lane markings indicate that a lane change is permitted. • Midway through the lane change, Model 3 must detect the target lane's outside lane marking. If this lane marking is not detected, the lane change is aborted and Model 3 returns to its original driving lane. • The view of the camera(s) is not obstructed. • Model 3 does not detect a vehicle in its blind spot, or a vehicle or obstacle up to the center of the target lane. If a vehicle or other obstacle is detected in the target lane, it is shown in red in the visualization on the touchscreen and Model 3 does not complete the lane change until it is safe to do so. <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> <p>On information and belief, Autopark carries out additional analysis to check each detected object in the image data to ensure there are no obstacles preventing the safe execution of an autopark.</p> <h2>Autopark</h2> <p>This feature may be temporarily limited or inactive until it is enabled with a future software update for vehicles manufactured as of approximately September 2023.</p> <div> <p>Note <i>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Autopark.</i></p> </div> <p>Autopark uses data to simplify parking on public roads by maneuvering Model 3 into parallel and perpendicular parking spaces.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>To Use Autopark</p> <p>When driving, follow these steps to allow Autopark to maneuver Model 3 into a parking space:</p> <ol style="list-style-type: none"> 1. While driving slowly, monitor the touchscreen to see potential parking spaces detected by Autopilot. When Model 3 is positioned such that it can reverse into one of the detected locations, the touchscreen displays a parking icon.  <p>Note The parking icon appears only if the vehicle's position and/or the circumstances of the surrounding area are such that Autopark can determine an appropriate driving path. If Autopark cannot determine an appropriate path (for example, when driving on a narrow street where moving into the parking space causes the front of the vehicle to extend into the adjacent lane), you can either reposition the vehicle, find a different parking space, or park manually.</p> <ol style="list-style-type: none"> 2. Choose a spot, check to determine if it is appropriate and safe, then pull forward and stop approximately one car length ahead of the parking space (as you normally would when parallel parking or when backing into a perpendicular parking space). 3. Release the steering wheel, then touch and hold Autopark in the drive mode strip on the touchscreen. You can release the button once Autopark engages. 4. Autopark displays a message when parking is complete. <p>If you press the brake pedal when Autopark is actively parking Model 3, the parking process pauses until you touch Resume on the touchscreen.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <h2>Calibrating Cameras</h2> </div> <p>Model 3 must maneuver with precision when Autopilot features are being used. Therefore, before some features can be used for the first time or after some types of service repairs, cameras must complete a self-calibration process. For your convenience, the touchscreen displays a progress indicator.</p> <p>When calibration is complete, Autopilot features are available for use. Calibration typically completes after driving 20-25 miles (32-40 km), but the distance varies depending on road and environmental conditions. For example, calibration completes quicker when driving on a straight road with multiple lanes (such as a controlled-access highway), with highly-visible lane markings (in the driving lane as well as the adjacent lanes). Contact Tesla only if your Model 3 has not completed the calibration process after driving 100 miles (160 km) in the described conditions.</p> <p>If a camera has shifted from its calibrated position (for example, the camera or windshield was replaced), you must clear the calibration. To do so, touch Controls > Service > Camera Calibration > Clear Calibration. When the calibration is cleared, Model 3 repeats the calibration process. While this helps re-calibrate the cameras in many cases, Clear Calibration may not resolve all camera and sensor concerns.</p> <p>Source: https://service.tesla.com/docs/Public/diy/model3/en_us/ (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>Adjust (Service Mode)</p> <ol style="list-style-type: none"> <li>1. Enable Service Mode through the touchscreen. See <u>Service Mode</u> ☺ . <li>2. Unlock the vehicle gateway for diagnostic communication. See <u>Gateway (Unlock)</u> ☺ <li>3. Touch Driver Assist (steering wheel icon) and then touch Cameras. <li>4. Touch Clear Camera Calibration, select ForwardFacing, and then touch Run. <li>5. Touch Close when the routine has passed. <li>6. Touch Reset DAS, and then touch Run. <li>7. Touch Close when the routine has passed. <li>8. Touch Camera Preview and then touch Main. <li>9. Touch Pitch Verification to add the verification lines on the display. <li>10. Review the image on the touchscreen: <p>Source: https://service.tesla.com/docs/Model3/ServiceManual/en-us/ (last accessed on April 10, 2024).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> </div> <p>This Is What Tesla's Autopilot Sees On The Road</p> <div> Carscoops 69.4K subscribers Subscribe 1.1K Share Download ... </div> <div> <p>203,002 views Jan 31, 2020</p> <p>This video shows what Tesla Autopilot's neural network sees on the road. Tesla says the system relies on per-camera networks to analyze raw images to perform semantic segmentation, object detection and monocular depth estimation. It employs birds-eye-view networks to take a video from all cameras to output the road layout, static infrastructure and 3D objects directly in the top-down view.</p> </div> <p>Source: https://www.youtube.com/watch?v=fKXztwtXaGo at 0:04 (last accessed on April 10, 2024).</p>

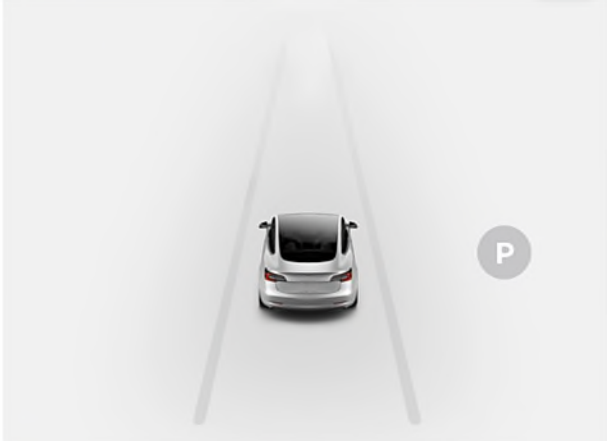
Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	 <p>This Is What Tesla's Autopilot Sees On The Road</p> <p>Carscoops 69.4K subscribers</p> <p>203,002 views Jan 31, 2020</p> <p>This video shows what Tesla Autopilot's neural network sees on the road. Tesla says the system relies on per-camera networks to analyze raw images to perform semantic segmentation, object detection and monocular depth estimation. It employs birds-eye-view networks to take a video from all cameras to output the road layout, static infrastructure and 3D objects directly in the top-down view.</p> <p>Source: https://www.youtube.com/watch?v=fKXztwtXaGo at 0:18 (last accessed on April 10, 2024).</p>
<p>1[h] storing at least one accepted object that corresponds to a most proximate destination together with corresponding relative positional</p>	<p>On information and belief, the Tesla Automotive Vehicles perform the extracting step including storing at least one accepted object that corresponds to a most proximate destination together with corresponding relative positional data in an object list.</p> <p>On information and belief, the accepted objects are the lane marking identifying the adjacent lane. Autopilot use the relative position of the lane marking to accurately move into the adjacent lane. The FSD hardware runs the Autopilot algorithms and manages the objects and their positional data.</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
data in an object list.	<div> </div> <div> <p>sions including sensors</p> </div> <div> <p>The FSD SoC, as shown in Figure 2(b), provides general-purpose CPU cores that run most of the autopilot algorithms.</p> </div> <div> <p>Every few milliseconds, new input frames are received through a dedicated image signal processor where they get pre-processed before being stored in the DRAM. Once new frames are available in the main memory, the CPUs instruct the NNA accelerators to start processing them. The accelerators control the data and parameters streaming into their local SRAM, as well as the results streaming back to the DRAM. Once the corresponding result frames have been sent out to the DRAM, the accelerators trigger an interrupt back to the CPU complex. The GPU is available for any postprocessing tasks that might require algorithms not supported by the NNA accelerators.</p> </div> <div> <p>Source: “Compute Solution for Tesla’s Full Self-Driving Computer,” E. Talpes et al., Tesla Hot Chips Paper, IEEE Computer Society (2020).</p> </div>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <p>Figure 2(a) is a die photograph of the FSD chip showing various functional blocks. A yellow box highlights the 'ISP Video Enc' block. A green box highlights the 'GPU x1' block. A red box highlights the 'NNA x2' block. A blue box highlights the 'CPU x12' block. A purple box highlights the 'Safety & Security' block. Figure 2(b) is a SoC block diagram showing the interconnectivity of these blocks. It includes a 'DRAM controller' at the top, connected to an 'NOC controller'. Below the NOC controller are three 'AI CPU' blocks, each with its own 'L2 Cache'. Further down are '32MB SRAM' blocks, 'NPU P1' and 'NPU A2' blocks, and another '32MB SRAM' block. On the left side, there are blocks for 'CPU L2L3', 'Workconnect controller', 'ISP', 'CPU', and 'Security'. Arrows indicate 'Non-coherent traffic' (orange) and 'Coherent traffic' (blue) paths.</p> </div> <p>Figure 2. (a) FSD chip die photo with major blocks. (b) SoC block diagram.</p> <p>Source: “Compute Solution for Tesla’s Full Self-Driving Computer,” E. Talpes et al., Tesla Hot Chips Paper, IEEE Computer Society (2020).</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div>  <p>PyTorch at Tesla - Andrej Karpathy, Tesla</p> <p>PyTorch 43.3K subscribers</p> <p>Subscribe</p> <p>502K views · 4 years ago · PyTorch Developer Conference 2019 Hear from Andrej Karpathy on how Tesla is using PyTorch to develop full self-driving capabilities for its vehicles, including AutoPilot and Smart Summon. ...more</p> </div> <p>Source: https://www.youtube.com/watch?v=oBklItKXtDE at 0:59 (last accessed on April 10, 2024).</p> <p>On information and belief, the accepted objects are the parking location. Autopark use the relative position of the parking lcoation to accurately move into the parking location. The FSD hardware runs the Autopark algorithms and manages the objects and their positional data.</p>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <h2>Autopark</h2> </div> <div> <p>This feature may be temporarily limited or inactive until it is enabled with a future software update for vehicles manufactured as of approximately September 2023.</p> </div> <div> <div> <div>i</div> <div> <p>Note</p> <p><i>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Autopark.</i></p> </div> </div> </div> <div> <p>Autopark uses data to simplify parking on public roads by maneuvering Model 3 into parallel and perpendicular parking spaces.</p> </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div>

Claim 1	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>To Use Autopark</p> <p>When driving, follow these steps to allow Autopark to maneuver Model 3 into a parking space:</p> <ol style="list-style-type: none"> 1. While driving slowly, monitor the touchscreen to see potential parking spaces detected by Autopilot. When Model 3 is positioned such that it can reverse into one of the detected locations, the touchscreen displays a parking icon.  <p>Note The parking icon appears only if the vehicle's position and/or the circumstances of the surrounding area are such that Autopark can determine an appropriate driving path. If Autopark cannot determine an appropriate path (for example, when driving on a narrow street where moving into the parking space causes the front of the vehicle to extend into the adjacent lane), you can either reposition the vehicle, find a different parking space, or park manually.</p> <ol style="list-style-type: none"> 2. Choose a spot, check to determine if it is appropriate and safe, then pull forward and stop approximately one car length ahead of the parking space (as you normally would when parallel parking or when backing into a perpendicular parking space). 3. Release the steering wheel, then touch and hold Autopark in the drive mode strip on the touchscreen. You can release the button once Autopark engages. 4. Autopark displays a message when parking is complete. <p>If you press the brake pedal when Autopark is actively parking Model 3, the parking process pauses until you touch Resume on the touchscreen.</p> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p>

Claim 6	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>6. The method as recited in claim 1, wherein the calculation of the at least one trajectory includes considering a steering property and a capability of the motor vehicle.</p>	<p>On information and belief, the Tesla Automotive Vehicles perform the step of the method as recited in claim 1, wherein the calculation of the at least one trajectory includes considering a steering property and a capability of the motor vehicle.</p> <p>See Claim 1.</p> <div> <p>An integral part of the autopilot system in Tesla's cars is a deep neural network that identifies lane markings in camera images. Neural networks "see" things much differently than we do, and it's not always obvious why, even to the people that create and train them. Usually, researchers train neural networks by showing them an enormous number of pictures of something (like a street) with things like lane markings explicitly labeled, often by humans. The network will gradually learn to identify lane markings based on similarities that it detects across the labeled dataset, but exactly what those similarities are can be very abstract.</p> </div> <p>Source: https://spectrum.ieee.org/cars-that-think/transportation/self-driving/three-small-stickers-on-road-can-steer-tesla-autopilot-into-oncoming-lane (last accessed on April 10, 2024).</p>

Claim 6	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p> The initial step in Tencent's testing involved direct access to Tesla's software. Researchers showed the lane detection system a variety of digital images of lane markings to establish its detection parameters. As output, the system specified the coordinates of any lanes that it detected in the input image. By using "a variety of optimization algorithms to mutate the lane and the area around it," Tencent found several different types of "adversarial example[s] that [are similar to] the original image but can disable the lane recognition function." Essentially, Tencent managed to find the point at which the confidence threshold of Tesla's lane-detecting neural network goes from "not a lane" to "lane" or vice-versa, and used that as a reference point to generate the adversarial lane markings. Here are a few of them: </p> <p> Source: https://spectrum.ieee.org/cars-that-think/transportation/self-driving/three-small-stickers-on-road-can-steer-tesla-autopilot-into-oncoming-lane (last accessed on April 10, 2024). </p>

Claim 6	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> </div> <p>Fig 29. Left picture shows we add some noise on the left lane line in digital level, and right picture shows the result of APE's lane recognition function. (We redact top left of our image for privacy reasons, but it won't affect the final result.)</p> <div> </div> <p>Fig 30. Left picture shows we add some patch around the left lane line in digital level, and right picture shows the result</p> <p>Source: https://spectrum.ieee.org/cars-that-think/transportation/self-driving/three-small-stickers-on-road-can-steer-tesla-autopilot-into-oncoming-lane (last accessed on April 10, 2024).</p>

Claim 6	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<div> <h2>Autopilot Features</h2> </div> <div> <p>This topic describes how to enable and use the following driver assistance features.</p> </div> <div>  </div> <div> <p>Note</p> </div> <div> <p>Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with the following features, or a feature may not operate exactly as described.</p> </div> <div> <ul style="list-style-type: none"> • Traffic-Aware Cruise Control: Like traditional cruise control, Traffic-Aware Cruise Control maintains a set driving speed. However, Traffic-Aware Cruise Control also slows down or accelerates Model 3 as needed to maintain the following distance from the vehicle in front of you. While Traffic-Aware Cruise Control is engaged, you are still responsible for steering Model 3 (see Traffic-Aware Cruise Control). • Autosteer: Like Traffic-Aware Cruise Control, Autosteer maintains a set speed (if there is not a vehicle in front of you) or a set following distance (if there is a vehicle in front of you). In addition, Autosteer detects lane markings, road edges, and the presence of vehicles and objects to intelligently keep Model 3 in its driving lane (see Autosteer). </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div> <div> <ul style="list-style-type: none"> • Auto Lane Change: When you engage a turn signal while Autosteer is active, Auto Lane Change moves Model 3 into the adjacent lane in the direction indicated by the turn signal (see Auto Lane Change). </div> <div> <p>Source: https://www.tesla.com/ownersmanual/model3/en_us/ (last accessed on April 10, 2024).</p> </div>

Claim 7	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
7. The method as recited in claim 6, further comprising rejecting a potential	<p>On information and belief, the Tesla Automotive Vehicles perform the step of rejecting a potential destination that is not reachable given the steering property and capability of the motor vehicle.</p> <p>See Claim 6.</p>

Claim 7	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>destination that is not reachable given the steering property and capability of the motor vehicle.</p>	<div> <p>The initial step in Tencent's testing involved direct access to Tesla's software. Researchers showed the lane detection system a variety of digital images of lane markings to establish its detection parameters. As output, the system specified the coordinates of any lanes that it detected in the input image. By using "a variety of optimization algorithms to mutate the lane and the area around it," Tencent found several different types of "adversarial example[s] that [are similar to] the original image but can disable the lane recognition function." Essentially, Tencent managed to find the point at which the confidence threshold of Tesla's lane-detecting neural network goes from "not a lane" to "lane" or vice-versa, and used that as a reference point to generate the adversarial lane markings. Here are a few of them:</p> </div> <p>Source: https://spectrum.ieee.org/cars-that-think/transportation/self-driving/three-small-stickers-on-road-can-steer-tesla-autopilot-into-oncoming-lane (last accessed on April 10, 2024).</p>

Claim 8	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>8. The method as recited in claim 1, further comprising informing a driver of the motor vehicle about a position of at least one potential</p>	<p>On information and belief, the Tesla Automotive Vehicles perform the step of informing a driver of the motor vehicle about a position of at least one potential destination and about the at least one trajectory.</p> <p>See Claim 1.</p>

Claim 8	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
destination and about the at least one trajectory.	

Claim 9	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
9. The method as recited in claim 1, further comprising performing an at least semi-automatic vehicle guidance to the most proximate destination using the at least one trajectory.	<p>On information and belief, the Tesla Automotive Vehicles perform the step of performing an at least semi-automatic vehicle guidance to the most proximate destination using the at least one trajectory.</p> <p>See Claim 1.</p> <p><u>Autopilot</u></p> <ul style="list-style-type: none"> • Traffic-Aware Cruise Control: Matches the speed of your car to that of the surrounding traffic • <u>Autosteer:</u> Assists in steering within a clearly marked lane, and uses traffic-aware cruise control <p>Source: https://www.tesla.com/support/autopilot (last accessed on April 10, 2024).</p> <ul style="list-style-type: none"> • Auto Lane Change: When you engage a turn signal while Autosteer is active, Auto Lane Change moves Model 3 into the adjacent lane in the direction indicated by the turn signal (see Auto Lane Change on page 93). <p>Source: https://www.tesla.com/sites/default/files/model_3_owners_manual_north_america_en.pdf at 92 (last accessed on April 10, 2024).</p>

Claim 9	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
	<p>  NAVIGATE ON AUTOPILOT </p>  <p>Source: https://www.youtube.com/watch?v=oBklItKXtDE&feature=youtu.be&t=91 at 0:59 of 11:10 (last accessed on April 10, 2024).</p>

Claim 10	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
<p>10. The method as recited in claim 9, further comprising using at least one of an audible and a visual signaling during the vehicle guidance to assist a driver of the vehicle in observing the trajectory.</p>	<p>On information and belief, the Tesla Automotive Vehicles perform the step of using at least one of an audible and a visual signaling during the vehicle guidance to assist a driver of the vehicle in observing the trajectory.</p> <p>See Claim 9.</p>

Claim 11	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
11. The method as recited in claim 9, further comprising:	On information and belief, the Tesla Automotive Vehicles perform the method as recited in claim 9. <i>See Claim 9.</i>
continuously monitoring a position of the stored at least one accepted object during the vehicle guidance;	On information and belief, the Tesla Automotive Vehicles perform the step of continuously monitoring a position of the stored at least one accepted object during the vehicle guidance.
selecting a new most proximate destination when the most proximate destination is no longer easily reachable, wherein the new most proximate destination is selected based on an active position of the motor vehicle and in determining the at least one accepted object that is best reachable, considering a steering properties and a capability of the vehicle; and	On information and belief, the Tesla Automotive Vehicles perform the step of selecting a new most proximate destination when the most proximate destination is no longer easily reachable, wherein the new most proximate destination is selected based on an active position of the motor vehicle and in determining the at least one accepted object that is best reachable, considering a steering properties and a capability of the vehicle.

Claim 11	Example Evidence of Tesla Automotive Vehicles – U.S. Patent No. 7,336,805
computing a new trajectory describing a new optimized travel path based on the active position.	On information and belief, the Tesla Automotive Vehicles perform the step of computing a new trajectory describing a new optimized travel path based on the active position.