

### **Abstract**

1. Nowadays most teenagers go everywhere with their smartphones, which have built-in GPS capabilities to pinpoint the precise location of the devices. This invention helps parents monitor the driving or traveling speed of their children by monitoring the linear speed of their phones' movement. The claimed invention involves gathering geographic location information from the built-in GPS capabilities of smartphones to track the movement of the phones at preset time intervals and calculating the speed of these smartphone movements by dividing the linear distance traveled between two consecutive locations by the time interval.

### **Background of Prior Art**

2. GPS is a worldwide navigation system formed by 32 satellites along with ground control stations and user GPS receivers. The satellites orbit the earth at an altitude of about 12,600 miles, with each satellite following one of six orbital planes as it circles the earth. Each orbital plane contains multiple satellites, the net effect being to ensure that at least five satellites are always visible to a GPS receiver on the ground.

3. GPS satellites transmit signals continuously that contain their current time and position. A GPS receiver works by listening to multiple satellites and solves equations to determine the exact position of the receiver and its deviation from true time. A GPS receiver usually needs signals from, at minimum, four satellites in order to compute its precise position (*i.e.*, its latitude, longitude, and altitude coordinates plus clock deviation from satellite time).

4. A GPS receiver can use the information uniquely coded within a satellite signal to identify the satellite and to measure the time delay between transmission of a GPS signal by a satellite and reception by the GPS receiver. Because the signal travels at approximately the speed of light, the time delay can be used to calculate the distance between the satellite and the GPS receiver. The signals from the GPS satellite also carry information about the satellite's positions. By using the signals from four or more satellites and using the estimated position of the satellites positions as reference points, the GPS receiver can calculate its own position within meters.

### **Description of the Invention**

5. Most commercial utilizations of GPS data have been hampered by the need to receive and process signals from at least four satellites at a time to determine the location of a receiver, as well as the need to process such data rapidly on a mobile microprocessor without significant time delay and power consumption.

6. The claimed invention teaches a remote system and method of extracting and utilizing geographic data using signals from only two satellites at a time to determine the latitude and longitude coordinates received by a GPS receiver. The claimed system stores and processes a series of geographic data received by a GPS receiver at preset time intervals from two satellites. It first calculates the linear distance between two consecutive sets of geographic coordinates,

then divides such distance by the preset time interval to calculate the average speed traveled by the GPS receiver within the time. The preset time interval may also be programmed based on real-time speed feedback or general traffic conditions. Because signals from any two satellites visible to a receiver may be used for the calculation, the claimed invention allows more combinative data to be analyzed and hence more reliable signal utilization.

7. Since the altitude for most terrestrial driving stays fairly constant within a range, the claimed invention assigns an approximate value representative of the altitude coordinate of that geographic region to the equation. By reducing the number of variables needed to be solved, the claimed invention allows faster processing and utilizing of GPS data in real-time. By processing such GPS data remotely, the claimed system and method also help conserve the processing power and battery of the mobile phone device.

8. In addition, when the speed passes a preset speed limit, *i.e.*, whenever the mobile phone devices are detected to be moving faster than a preset dangerous speed limit for a duration of time, a message generator of the claimed invention generates a message. The content includes at least the value of the last over-limit speed detected and may include additional information, such as last location of device known. It also can transmit the alert message to a subscriber via one or more communication networks, *e.g.*, a subscriber may receive the alert via text, email, or voice call. Typically, the subscriber is a parent, but it can also be the device user. That way parents can be warned when their children are driving too fast or traveling inside a vehicle that is moving too fast.

**Claim 1.**

A system for generating and transmitting an alert to a subscriber comprising:

a transceiver that requests and receives geographic data at a preset time interval from a mobile phone device comprising a GPS receiver;

a memory that stores said geographic data;

a processor that calculates the linear distance between two geographic points using said geographic data;

said processor further calculates the average speed of said mobile device between the two geographic points;

said processor compares said speed to a preset limit;

a message generator that composes a message, including said speed and geographic location of said mobile device when said speed exceeds said limit; and

a transmitter for transmitting said message to a subscriber via a network connection.

**Declaration of Addison Swift, Defendant Speed Trap, Inc.’s Expert,  
Regarding Invalidity under 35 U.S.C. § 101**

I have been retained as an expert for the Defendant to provide an opinion regarding whether the asserted claim 1 is invalid because it claims an abstract idea and/or lacks an “inventive concept” that amounts to significantly more than an abstract idea. I have also been asked to respond to various claim construction issues and factual assertions made by the Plaintiff.

**I. Qualifications**

I have been a Professor of Electrical and Computer Engineering at the Palo Alto Institute of Technology since 1994. I received a B.S. in Electrical Engineering and Computer Science from the California Institute of Technology in 1979 and a Ph.D. in Electrical Engineering from Silicon Valley University in 1987. From 1987-1994, I worked as a researcher at the Global Position Signaling Research Center where I studied a wide variety of applications of GPS signals and data processing that were implemented in both hardware and software.

**II. Legal Standards**

I am not an attorney. For purposes of preparing this declaration, I have been informed by Defendant’s counsel about certain legal principles relevant to my analyses and opinions. My understanding of those principles is summarized below.

I understand that validity under 35 U.S.C. § 101 is a “threshold” issue for the Court to decide as a matter of law. *See Bilski v. Kappos*, 561 U.S. 593, 602 (2010). I understand that § 101 defines patentable inventions to include “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof[.]” I further understand that the Supreme Court has “long held that [§ 101] contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014).

I understand that, in *Alice*, the Supreme Court set forth a two-step test for analyzing validity under section 101. Step one requires the court to “determine whether the claims at issue are directed to one of those patent-ineligible concepts,” such as an abstract idea. *Id.* In describing the first step, the *Alice* Court expressly declined to “labor to delimit the precise contours of the ‘abstract ideas’ category.” *Id.* at 2357. However, the Court emphasized that:

Laws of nature, natural phenomena, and abstract ideas are the basic tools of scientific and technological work. Monopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it, thereby thwarting the primary object of the patent laws.

*Id.* at 2354 (internal quotations and citations omitted.)

I understand that the Federal Circuit has interpreted the Supreme Court’s guidance post-*Alice* to mean that abstract ideas that are the basic tools of scientific work, such as mathematical formulas, are clearly not patentable. *See Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*,

758 F.3d 1344, 1348 (Fed. Cir. 2014) (“If a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.”).

I also understand that, pre-*Alice*, the Supreme Court had limited the scope of patentable subject matter for computer-related inventions, finding unpatentable abstract ideas such as computerized methods for converting binary-coded decimal numerals into pure binary numerals and computerized methods for sounding an alarm when parameters of a catalytic conversion process exceeded limits established by a mathematical formula. *See Gottschalk v. Benson*, 409 U.S. 63, 72 (1972); *Parker v. Flook*, 437 U.S. 584, 594-96 (1978).

Assuming the claims at issue pass step one of *Alice*, I understand that step two requires that the court “consider the elements of each claim both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent-eligible application.” *Alice*, 134 S. Ct. at 2355 (citation and quotation marks omitted). The Supreme Court describes this second step “as a search for an inventive concept—*i.e.*, an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.” *Id.* (quotation marks and brackets omitted).

Although adding “something more” to an abstract idea may make it patentable, I understand that the Supreme Court has made clear that the “mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.” *See, e.g., Alice*, 134 S. Ct. at 2358.

### **III. The '999 Patent**

#### **A. Claim 1 of the '999 Patent Is Directed at an Abstract Idea**

Claim 1 is directed at the abstract idea of determining whether a speed threshold is crossed, and, if and when it is, informing a subscriber. The general idea underpinning the '999 patent is a mathematical formula for calculating speed. Claim 1 of the '999 patent teaches calculating “linear distance between two geographic points” and then using that information to calculate speed over a specified time interval. This idea traces at least as far back as 16th century physicist Galileo Galilei, who is often credited with first measuring speed through the formula  $V = d/t$ , where “V” represents velocity, “d” represents distance, and “t” represents time. The idea of the '999 patent is therefore nothing more than applying an already well-known mathematical formula and then reporting the results.

Further, the hardware elements described in claim 1 do not transform it into an “inventive concept.” Plaintiff does not dispute that certain hardware elements described in claim 1 are generic computer components, such as a processor or a memory. However, even elements such as a “mobile phone device comprising a GPS receiver” or a “message generator” do not rescue claim 1 from being unpatentable. A mobile device is no different than a computer, particularly since even the '999 patent touts the ubiquity of such devices. *See* '999 patent at Abstract. In addition, GPS technology has been in development since at least 1973.

Similarly, the requirement of a “message generator” does not add anything significant to claim 1 since any device, object, or person capable of communication could be understood as a “message generator,” especially since that term is not defined by the ’999 patent and is not a term of art or a term with special significance to one of skill in the art.

Finally, claim 1 does not address a problem specifically arising in the context of a new technology. Speeding is a problem that existed prior to and independent of the technology discussed in the ’999 patent. In fact, speed limits have been imposed in the United States since at least 1901. As such, claim 1 is invalid.

**B. No Claim Construction Is Necessary to Find Claim 1 Invalid**

I understand that Plaintiff alleges that claim 1 contains terms that must be construed prior to the Court making any determinations with regard to validity, such as “a transceiver that requests and receives geographic data . . . from a mobile phone device comprising a GPS receiver” and “message generator.” I disagree. The disputed terms and the parties’ proposed constructions are below:

<b>Disputed Term</b>	<b>Plaintiff’s Proposed Construction</b>	<b>Defendant’s Proposed Construction</b>
“a transceiver that requests and receives geographic data . . . from a mobile phone device comprising a GPS receiver”	A transceiver that wirelessly communicates with a mobile phone device to obtain signals from two or more GPS satellites.	Plain meaning.
“preset time interval”	A predetermined time interval that can be constant or variable.	Plain meaning.
“message generator”	A means for generating a message in accordance with mobile device protocols, such as SMS.	Plain meaning.

Only two of the disputed terms arguably concern hardware-related claim elements (“a transceiver . . .” and a “message generator”), and even if the Court were to adopt Plaintiff’s proposed constructions, the ’999 patent would still be invalid. First, Plaintiff’s proposed constructions are unsupported by the ’999 patent. Nowhere in claim 1 does it indicate that the “transceiver that requests and receives geographic data . . . from a mobile phone device comprising a GPS receiver” must communicate with two or more GPS satellites. That said, even if the Court were to adopt Plaintiff’s proposed construction, this would not be a meaningful limitation because every GPS receiver must communicate with two or more GPS satellites for purposes of triangulating a location. GPS receivers function in part by measuring a receiver’s distance from multiple satellites, typically three or more. This process is called “trilateration.” Since communicating with one satellite alone would be insufficient for any GPS receiver to determine its location, this is not a significant limitation.

Second, Plaintiff's proposed construction of "message generator" is also unsupported by the '999 patent. Claim 1 specifies that the message composed by the message generator must include "said speed and geographic location of said mobile device when said speed exceeds said limit," but it does not indicate that the message must be composed in accordance with mobile device protocols. Even under Plaintiff's proposed construction, however, this element does not impose a meaningful limit on the scope of the claim because the message generator is not integral to claim 1. As such, claim construction is at most a red herring with regard to invalidity under section 101.

**C. There Are No Genuine Issues of Material Fact With Respect to Claim 1**

I understand that Plaintiff alleges that a product embodying the '999 patent has met with commercial success, and that this is purportedly a material fact in dispute. The alleged commercial success of a product embodying the '999 patent does not change my analysis or opinions above.

FICTION

**Declaration of Skyler Calculo, Plaintiff GPS Alert Systems' Expert,  
in Support of Patent-Eligibility under 35 U.S.C. § 101**

I have been retained as an expert for the Patentee to provide an opinion regarding various factual issues underlying the determination whether the asserted claim 1 contains patentable subject matter, including whether the patent claim is an abstract idea, and/or includes an element or combination of elements sufficient to ensure that the patent in practice amounts to significantly more than a patent upon an abstract idea. I have also been asked for my expert opinion regarding the construction of various claim terms from the patent. This report sets forth my constructions and reasoning for my constructions. I expect to testify at trial regarding the matters set forth in this report, if asked about these matters by the Court or by the parties' attorneys.

**I. Qualifications**

I have been a Professor at Silicon Valley University since 1991. My current titles are Professor of Electrical and Computer Engineering and Professor of Computer Science. I received a Bachelor of Science degree in Electrical Engineering from Harvard University in 1981 and received my Ph.D. in Electrical Engineering from the same school in 1989. I worked an engineer at GPS Research Company from 1989-1991 and designed hardware and software for a variety of applications of GPS signals and data processing.

**II. Legal Standards**

I am not a lawyer. In preparing this declaration, I have operated under the following understanding of the relevant law, which the Patentee's counsel has provided to me. I understand that there is a two-step framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts. I understand that the first step is to determine whether the claims-at-issue are directed to one of those patent-ineligible concepts (i.e., laws of nature, natural phenomena, and abstract ideas). If a claim at issue is directed to a patent-ineligible concept, the second step is to determine whether there is an inventive concept in the claim to transform the nature of the claim into a patent-eligible application of the ineligible concept. I understand that an "inventive concept" is an element or combination of elements that is sufficient to ensure that the patent claim in practice amounts to significantly more than a claim upon the ineligible concept itself.

I understand that claims directed to only patent-ineligible concepts are not patentable, while claims that have inventive concepts are patentable. I also understand that the Supreme Court has noted that at some level, all inventions embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas. In determining whether a claim is directed at only ineligible concepts or includes inventive concepts, I understand that the Supreme Court has noted that it is important to distinguish between patents that claim the building blocks of human ingenuity and those that integrate the building blocks into something more, thereby transforming them into a patent-eligible invention.

I also understand that while the analysis of patent-eligible subject matter is ultimately a legal determination, it can be rife with underlying factual issues. In this regard, I understand that the Federal Circuit has explained:

[T]here is no doubt the § 101 inquiry requires a search for limitations in the claims that narrow or tie the claims to specific applications of an otherwise abstract concept. Further, factual issues may underlie determining whether the patent embraces a scientific principle or abstract idea. If the question is whether “genuine human contribution” is required, and that requires “more than a trivial appendix to the underlying abstract idea,” and were not at the time of filing “routine, well-understood, or conventional,” factual inquiries likely abound. Almost by definition, analyzing whether something was “conventional” or “routine” involves analyzing facts. Likewise, any inquiry into the scope of preemption – how much of the field is “tied up” by the claim – by definition will involve historic facts: identifying the “field,” the available alternatives, and preemptive impact of the claims in that field.

*Ultramercial v. Hulu, LLC*, 722 F.3d 1335, 1339 (Fed. Cir. 2013) (internal citations omitted), *vacated on other grounds*, 134 S. Ct. 2870 (2014).

### **III. The ‘999 Patent**

#### **A. Claim 1 of the ‘999 Patent Is Directed at a Useful Machine.**

I understand that Defendant argues that the asserted claim 1 is directed at an abstract idea of gathering, combining, processing, and reporting GPS signals through conventional algorithms performed by generic computer components. I disagree with such gross oversimplification of the claimed solution.

I understand that Defendant argues that the asserted claim is abstract because it can be performed by human mental process alone. I disagree. The claimed solution cannot be performed by a human because a human brain cannot read or decipher wireless signals from GPS satellites. I further disagree with Defendant’s argument that the asserted claim is abstract as merely gathering of geographic data and thereafter converting such data via mathematical operation and implementing mathematical operation on a physical machine.

The asserted claim is directed at a useful machine, a patent eligible patent subject matter. The asserted claim recites a machine comprising various non-generic computer components, such as a GPS receiver and a message generator. The claimed invention provides a specific solution of using GPS data received from a GPS receiver integrated into a mobile phone device to ascertain the average speed of the receiver between two geographic points within a preset time interval, and thereafter composing and transmitting an alert to a specified subscriber only when detected speed exceeds a preset speed limit.



## **B. Claim 1 of the '999 Patent Is Directed at Specific Technological Improvements.**

While I do not consider claim 1 to be abstract, even if it was so considered, I believe that certain claim limitations individually and the ordered combination of the claim elements of claim 1 incorporate technological improvements amounting to significantly more than an abstract idea. Thus, the '999 patent is directed at a system that includes inventive and concrete concepts.

I understand that Defendant argues that the asserted claim offers no inventive concept beyond the well-known, conventional methods of detecting and deciphering GPS data and alerting a subscriber when a speed detected exceeds a preset limit. I disagree.

The claimed solution is a specific improvement to existing technology in utilizing GPS data. It provides a concrete way of improving the reading and usage of GPS signals. It also improves the efficiency in calculating useful information based on geographic coordinates. The claimed solution relies on the functions of a GPS receiver, memory, processor, message generator, and transmitter. These components are integral to the steps of retrieving, storing, and calculating distance, and not just an automated way of doing it faster than human brains.

The claimed solution also provides a specific improvement in speed calculation. The patent recites the innovative step of requesting and receiving GPS signals at a programmable preset time interval that allows for real-time adjustment based on speed feedback or general nearby traffic conditions.

Even if each element taken separately was well-known in the art, the elements taken as a whole in ordered combination serves an innovative way to help parents monitor their children's driving, which achieves a solution that the industry had not been able to do. Prior to the conception date of the claimed solution, I was not aware of any other hardware or software capable of measuring and reporting linear speed of a mobile user in real-time based on mobile phone GPS receivers alone. Most prior art systems and methods required the assistance from installation of additional equipment that tracks velocity.

I understand that the claimed solution was commercially successful and pioneered a new market for products for alerting parents when their children are driving dangerously using their mobile phones, without the need to install additional monitoring devices inside vehicles.

I further disagree with Defendant's argument that the claimed solution preempts all possible ways of using GPS data to obtain and alert speed information of a mobile device user. Instead, it claims a concrete method that overcame a particular challenge of having to install extra hardware in order to determine velocity in real-time by extracting and processing GPS data from two satellite signals via built-in GPS receivers on mobile phones.

## **C. Claim Construction Is Required Before Patentability Determination.**

I understand that Defendant alleges that no claim construction is required before patentability determination of claim 1. I disagree. A person of ordinary skill in the art at the time of the invention would have understood the claim terms as follows:

Disputed Term	Patentee's Proposed Construction	Support
"a transceiver that requests and receives geographic data ... from a mobile phone device comprising a GPS receiver"	A transceiver that wirelessly communicates with a mobile phone device to obtain signals from two or more GPS satellites.	" ...a remote system and method of extracting and utilizing data using signals from only two satellites at a time ... received by a GPS receiver."
"preset time interval"	A predetermined time interval that can be constant or variable	"The preset time interval may also be programmed based on real-time speed feedback or general traffic conditions."
"message generator"	A means for generating a message in accordance with mobile device protocols, such as SMS.	"... a message generator of the claimed invention generates a message. The content includes at least the value of the last over-limit speed detected and may include additional information, such as last location of device known...."