

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNITED SERVICES AUTOMOBILE ASSOCIATION,
Petitioner,

v.

AUTO TELEMATICS LTD.,
Patent Owner.

Case IPR2023-00519
Patent No. 9,633,487 B2

DECLARATION OF CHRISTOPHER K. WILSON

I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements are made with the knowledge that willful false statements so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: June 28, 2023

By: 
Christopher K. Wilson

AT-2001

I, Christopher K. Wilson, am over the age of 18 years and competent to testify to the matters set forth in this Declaration.

1. I have been retained by the Owner of United States Patent No. 9,633,487 (“the ’487 patent”), Auto Telematics, LTD. (“Auto Telematics” or “Patent Owner”), to offer certain opinions as set forth below in response to the Petition for *Inter Partes* Review of U.S. Patent No. 9,633,487 B2 (“the ’487 patent”) filed by United States Automobile Association (“USAA” or “Petitioner”).

2. I am not, and never have been, an employee of USAA or Auto Telematics. I received no compensation for this declaration beyond my normal hourly compensation based on my time actually spent analyzing certain issues related to the ’487 patent, the prior art publications cited below, and any other documents referenced herein. I will not receive any added compensation based on the outcome of any IPR or other proceeding related to the ’487 patent.

EDUCATION AND EXPERIENCE

3. I earned a BA degree in 1981 in Physics from Princeton University. I was then a PhD candidate at the University of California, San Diego in Astrophysics. I have taken and passed numerous business, strategy, and technology courses at Harvard University, Stanford University, University of California, Berkeley, and the Massachusetts Institute of Technology.

4. I have significant experience in automobile telematics obtained while working as a Senior Research Scientist, Group Manager (Telematics and Safety), and Vice President for ITS Strategy & Programs at DaimlerChrysler Research and Technology North America, Inc. from 1996 – 2008. I was also a Director at TomTom BV from 2008 through 2011. TomTom BV was one of the original developers of sophisticated mapping and location technology.

5. I was the CEO of Vehicle Data Science Corporation from 2013 – 2016 which built kinematic maps for automated vehicle applications.

6. I am currently a consultant advising companies on connected vehicle technology, automobile telematics, and advanced safety applications, as well as a testifying expert witness for related legal matters.

7. I have participated in the early development of key connected vehicle telematics and safety technologies utilizing radar, lidar, cameras, and other vehicle positioning technologies, vehicle-to-vehicle communication technologies, GPS positioning technologies, and vehicle diagnostic technologies.

8. I have approximately forty (40) years of experience in the development, maintenance and use of vehicle telematics systems (including for missiles and spacecraft, as well as ground vehicles) and have been qualified by courts as an expert in numerous patent cases. A more extensive listing of my experience and

qualifications may be found in my current *curriculum vitae* attached hereto as ***Appendix A***.

LEVEL OF ORDINARY SKILL IN THE ART

9. I have been informed that a person of ordinary skill in the art (“POSITA”) is a hypothetical person who is presumed to have the skill and experience of an ordinary person in the relevant field at the time of the alleged invention.

10. It is my understanding that William R. Michalson, USAA’s expert offered in support of its Petition, has offered an opinion that a person of ordinary skill in the art in this matter would have at least a Bachelor’s of Science Degree (or equivalent) in an academic area emphasizing electrical engineering, computer engineering, computer science, or a related technical field, and about 2-3 years of experience in the field of telematics systems (*e.g.*, familiarity with control and diagnostic systems, navigation systems, and wireless communication technology).

11. I would add that a POSITA may also include individuals with a Bachelor of Science degree (or equivalent) in other fields, including physics, and that the particular educational experience becomes less relevant as the individual’s experience in the telematics field increases. In this regard, a POSITA would include

individuals with a Bachelor's of Science Degree in any discipline and 3-5 years of experience in the field of telematics systems.

12. Based on my experiences, I have a good understanding of the understandings and capabilities of a POSITA in the field related to the invention claimed in the '487 patent. Indeed, I have worked closely with many such individuals over the course of my career. I was also a POSITA myself during the early parts of my career.

MY UNDERSTANDING OF CERTAIN LEGAL PRINCIPLES

13. I am not a lawyer and will not provide any legal opinions in this IPR. I have, however, been advised of certain relevant legal principles and will apply those legal principles when offering my opinions in this matter.

14. I understand that claim terms are generally given their plain and ordinary meaning based on the patent's specification and file history as understood by a POSITA. I further understand that the words of the claims should be given their plain meaning unless that meaning is inconsistent with the patent specification or file history. I also understand that the claims should be interpreted as they would have been interpreted by a POSITA at the time the invention was conceived.

15. I understand that a continuation application is a later-filed application that has the same inventors and claims subject matter described or disclosed in an

earlier filed application to which the later-filed application claims priority. A continuation is generally entitled to the same priority date as the earlier-filed application to which it claims priority.

THE '487 PATENT

16. The '487 patent is directed to methods and systems for logging driving information associated with a vehicle when driven. In one embodiment, a mobile telecommunications device is provided that is adapted for installation to a vehicle and is configured to log driving information associated with the vehicle when driven. The mobile device is arranged to register the start of a driving period during which the mobile device is installed to the vehicle and the vehicle is being driven by a driver. The mobile device is also arranged to process sensor data during the driving period to derive driving information associated with how the vehicle is driven.

17. During prosecution of the '487 patent, the examiner rejected the claims over U.S. Pub. Nos. 2007/0135979 ("Plante"), 2005/0046584 ("Breed"), and 2008/0255722 ("McClellan"). The Non-Final Office Action dated November 10, 2016 rejected claims 9-11 and 13-16 under 35 U.S.C. § 102 over Plante, claim 12 under 35 U.S.C. § 103 over Plante in view of Breed, and claim 17 under 35 U.S.C. § 103 over Plante in view of McClellan.

18. The Applicant filed a Reply on December 16, 2016, amending certain claims in response to the rejections. The Reply further included arguments distinguishing the Plante reference. As a result, the examiner issued a Notice of Allowance on February 28, 2017.

PRIORITY DATE OF THE '487 PATENT

19. I have been asked by Auto Telematics to offer an opinion regarding its position that the '487 patent may claim a priority date prior to a particular prior art reference. In particular, it is my understanding that USAA asserts that US Patent Application Publication No.: US2011/0307188 A1 to Peng *et al* ("Peng" or "the '188 Application"), with a filing date of June 29, 2011 ("Peng Priority Date"), may be properly asserted as prior art to the '487 patent.

20. The application leading to the issuance of the '487 patent was filed on March 4, 2016, and claims priority to several applications relevant to my testimony including:

- Application No. 1021292.6 filed in Great Britain on December 15, 2010;
- Application No. 1101259.8 filed in Great Britain on January 25, 2011; and
- Application No. 1109759.9 filed in Great Britain on June 10, 2011.

It is my understanding that USAA has identified these applications as P1, P2 and P3, respectively. While I do not know the reasoning for this naming convention, I will use the same names to avoid any confusion.

21. P1 (USAA-1503) discloses the earliest version of the Witness application which was limited to use of a mobile phone to continuously record video of a vehicle's travels to promote vehicle safety and establish the cause of vehicle accidents. Accordingly, P1 does not explicitly support a claim of priority for the '487 patent.

22. P3 (USAA-1505), however, includes particular descriptions supporting each and every element of at least Claim 1 of the '487 patent. Accordingly, the claims of the '487 patent may claim a priority date of no later than June 10, 2011 (the filing date of P3), which predates Peng's effective priority date. As such, Peng may not be relied upon to invalidate the '487 patent.

P3 SUFFICIENTLY DISCLOSES FEATURE 1.6.

23. It is my understanding that USAA argues that two (2) features of the '487 patent are not sufficiently described in P1, P2 and P3 to allow the '487 patent to rely on any of these application's filing dates, each of which predate Peng. The first of these elements, described by the Petitioner as Feature 1.6, includes the claim language "determin[ing] based on the inputs received by the user interface and the

sensor data from the device's sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use."

USAA-1001 at Claim 1 (31:52-56). Petitioner focuses on the specific language that this determining step must be "based on the inputs received by the user interface and the sensor data," and that this step must determine the "start of a driving period." Contrary to Petitioner's arguments, however, both of these features are sufficiently described in at least P3 thereby justifying a priority date of no later than June 10, 2011.

24. In Figure 1, P3 shows a "recording screen" which at the bottom left hand corner includes a "start/stop" button.

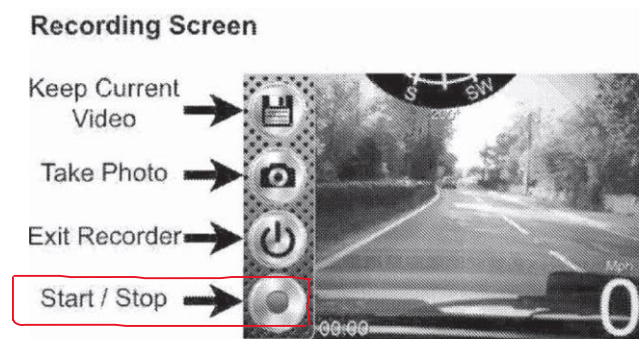


Figure 1

This feature is also referenced on p. 10 of P3 at both lines 27 ("Start/Stop Recording (starts recording video footage – and other data)") and line 33 ("[d]uring recording, (i.e. when the 'Start/Stop Recording' button is pressed) the Exit Recorder button in the Recording Screen is substituted with a Map Display button"). To use this feature,

a user of the Witness application would press this button to start the recording of driving data.

25. Since P3 also describes the mobile device as having a touch sensitive screen to receive user data inputs (at p. 5, line 35 P3 identifies the modern smart-phone as having a “[t]ouch-sensitive screen ([to receive] user data inputs)”), a person of ordinary skill in the art would know that the device could receive user inputs to start a recording by pressing the appropriate button on the screen. As such, P3 explicitly discloses that one of the inputs to determine the start of a driving period may comprise a user pressing the “Start/Stop” button on the touch screen.

26. P3 further makes clear that the invention can detect the speed at which a vehicle is being driven using GPS, and that this GPS is a part of the mobile device. P3 discloses that the “Witness application can receive the following sensor/data inputs, as is typical for modern smart phones: ... GPS module (Speed, location, elevation, direction etc).” USAA-1505 at 5:26-32. That is, the GPS is a sensor of the mobile device. P3 at 8:35 discloses that the GPS sensor provides speed information (the recorded input from the sensors can be used to aid an insurance company in assessing the risk profile of a driver by determining whether the driver is “[d]riving faster than the speed limit allocated to a given road (detected by GPS).” USAA-1505 at 8:35, *see also* 8:24-27. Further, when describing Figure 1, P3

indicates that the “detected speed” of the vehicle, as well as the direction the vehicle has traveled, may be overlaid on the video feed being displayed on the mobile device’s screen. USAA-1505 at 10:16, *see also* 10:13-17. This same concept is repeated on p. 12 at lines 18-21 wherein P3 states:

For example, date, time, speed, forward/backward G-forces, latitude, longitude and heading information is overlaid onto the video feed. As the video is played back, these values will typically change depending on the behavior of the vehicle, as recorded by the mobile device.

As such, it is clear that P3 discloses an application collecting inputs from both the user interface and sensors on the mobile device.

27. As to using those inputs to determine the start of a driving period, P3 is also clear. For example, Figure 8 clearly shows the ability of the application to switch from displaying a video feed on the mobile device’s screen to a map (or even switch the screen off entirely) once the vehicle has reached a predesignated speed. This functionality, P3 explains, is included as a safety feature:

Here it is possible for the user to select speed units and also select whether the map should be displayed during recording, and at which speed it should be displayed in favour of the video feed. ***This is a safety feature of the Witness application that hides the video feed during recording when the vehicle is detected as traveling above a pre-determined speed.*** The video speed is replaced by a map of the location

of the vehicle – as is typical with in-vehicle GPS devices. Note that although the on-screen video feed is replaced with a map, video recording continues in the background.

In alternatives, the application may be arranged to detect the vehicle speed, and at a particular speed, switch off the screen entirely. It should be understood that the device will continue to record video, telemetry and other information even when the screen is switched off. Entirely switching off the screen of the device is advantageous as it significantly reduces the drain on the battery and the mobile device.

USAA-1505 at 14:34-15:9 (emphasis added).

28. This disclosure makes clear that the display screen of the mobile device may be switched from a video feed to a map view (or to a blank view) when the detected speed of the vehicle is above a predetermined speed. The user can set this predetermined speed as indicated by the touch screen slider in Figure 8. Given this disclosure that the screen may be programmed to switch from a live video feed to a map view as a “safety feature,” a person of ordinary skill in the art would have known that the application could make this same determination. It is at the “start of a driving period” (as determined by the vehicle’s speed crossing a pre-determined threshold) wherein this safety feature could be activated.

29. A real-world example includes a user entering her vehicle, removably attaching her smart phone to the car via a docking station, USB connection, or some

other means, pressing the user interface button to start recording and then reversing her car out of a garage and then turning onto a roadway. The recording starts once the user presses the start button, however, there is little concern for distraction of the driver being caused by the video display during the period of time where the user is reversing out of her garage and getting up to driving speed. However, once the vehicle reaches a predetermined speed (*e.g.*, 10 mph) as determined by the sensor set, then the driving period during which a distracted driver may be a real safety concern is initiated. Accordingly, both the user interface input and sensor data are used together to determine the “start of a driving period.”

30. Accordingly, P3 would very clearly disclose to a person of ordinary skill in the art the element of “determining based on the inputs received by the user interface and the sensor data from the device’s sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use.”

P3 SUFFICIENTLY DESCRIBES ELEMENT 1.9

P3 Sufficiently Discloses to a POSITA the Derivation of Driving Information “Without Data from Vehicle Sensors”

31. It is my understanding that the ’487 patent’s claim term of deriving driving information “without data from vehicle sensors” is known as a negative limitation. It is my further understanding that, to satisfy the written description

requirement when evaluating a negative limitation, as with any other claim element, a patent's specification must reasonably convey to a POSITA that the inventor had possession of the claimed subject matter as of the filing date. I further understand that a negative limitation need not be recited in the exact terms of the limitation in the specification. Rather, the negative limitation need only generally include sufficient disclosure in the specification to convey to a POSITA that the inventor intended the exclusion. A negative limitation may be satisfied when a POSITA would understand the specification as inherently disclosing that limitation.

32. Contrary to USAA's assertions, P3 sufficiently describes the derivation of driving information "without data from vehicle sensors." In this regard, P3 makes clear that the witness application "interfaces with the hardware on a mobile device, such as a smart-phone." USAA-1505 at 5:14. P3 goes on to state that "it will be appreciated that a more sophisticated telephone (*e.g.*, a smart-phone) has a **richer** sensor set with which to record and determine the occurrence of an incident." USAA-1505 at 5:20-21 (emphasis added). A POSITA would recognize that the term "richer sensor set" is a comparative term – the sensor set being "richer" than some other sensor set. While the disclosure does not expressly identify the sensor set which is less rich than the mobile device's sensor set, it would have been recognized by a POSITA that the less rich sensor set, in the context of P3, would be

that of the vehicle's sensor set as it is the only other sensor set that reasonably could have been used as part of the disclosed invention. Thus, this disclosure makes clear that the sensor set on which the invention is relying to gather driving data is that of the smart-phone, and not sensors that are included in some other component with a "less rich" sensor set (*i.e.*, vehicle sensors).

33. Further support is found in P3 wherein a full list of sensor/data inputs common to modern smart phones is identified. USAA-1505 at 5:25-35 ("The Witness application can receive the following sensor/data inputs, as is typical for modern smart-phones: G-force/accelerator; Microphone (Audio); Camera (Picture/Video); GPS module (Speed, location, evaluation, direction etc); 3D compass (Orientation; Pitch, Roll and Yaw); Time/date; [and] Touch-sensitive screen (receiving user data inputs)"). P3 goes on to make clear that the application "is arranged to record a number of these sensor inputs continuously." USAA-1505 at 6:2-3. Reference to "***these*** sensor inputs" is a reference to the sensor inputs of the smart-phone referenced immediately above on p. 5.

34. These references to the mobile phone sensor set make clear that the application disclosed in P3, at least in the primary embodiment, was designed to rely on inputs received from the sensor set of the mobile phone. This, combined with the disclosure's teaching that the smart-phone's sensor set is "richer" than any other

sensor set that could be utilized by the invention, would make clear to a POSITA that the claim limitation of deriving driving information without data from the “less rich” vehicle sensors is clearly disclosed in P3.

P3 Sufficiently Discloses the Derivation of Driving Information Using Data from Both Vehicle and Mobile Device Sensors such that the Claim of Deriving Driving Information Without Data from Vehicle Sensors is Supported

35. Further support for P3’s disclosure of the derivation of driving information without data from vehicle sensors exists. P3 discloses an alternative embodiment wherein the invention relies on the vehicle’s sensors to, among other things, derive driving information. In this regard, P3 provides:

It would not be beneficial from the perspective of the insurance company if the user could choose when to enable the application. For example, if a user could choose to disable the application when speeding then the effectiveness of the application would be reduced.

Accordingly, the application may include measures to guarantee that the application is enabled whenever a given insured vehicle is being driven.

Such measures may involve matching data recorded by the Witness application with that recorded independently by the vehicle. For example, the Witness application records the distance travelled during every journey. To ensure the summed distances of all journeys tracked

by the Witness application tally with the total travelled distance of the vehicle, *the user may be prompted to enter the odometer mileage periodically.*

If the distance recorded by the Witness application does not correlate with the difference between odometer readings, then the discrepancy will be flagged to the user and/or the insurance company. A substantial discrepancy will typically indicate that the Witness application has not been monitoring all vehicle journeys and the appropriate action can be taken (e.g. the user can be warned, insurance premium may be raised etc).

P3 at 19:31 – 20:14 (emphasis added). In P3, the odometer, which itself is a vehicle sensor, is used to confirm that the application is accurately tracking the beginning and end of each driving period. As such, P3 discloses the use of both mobile device and vehicle sensors to derive driving information.

36. It is my understanding that while any negative limitation included in a claim must have a basis in the disclosure, that basis may be met if alternative elements are positively recited in the specification and then one or more of those alternative elements are explicitly excluded in the claims. In other words, it is my understanding that if a specification discloses the concept of using A and/or B, support for the negative limitation of using “A without B” is provided as the applicant is simply claiming a subset of what she or he disclosed.

37. As described above, the use of data from the mobile device's sensor set alone, as well as from the mobile device's sensor set in combination with the vehicle's sensor set, to derive driving information is disclosed in P3. As such, the claim's exclusion of data from one of those sensor sets, *i.e.*, the vehicle's sensor set, is also described. Having described using data from both vehicle and mobile device sensors, a POSITA would understand that the inventors necessarily described the use of data only from the mobile device's sensors. Accordingly, P3 provides the necessary disclosure to support Claim Element 1.9 thereby providing support for the '487 patent's reliance on the June 10, 2011, priority date; predating Peng by several weeks.

CONCLUSION

38. The findings and opinions set forth in this declaration are based on my work and examinations to date.

39. I may continue my examinations. I may also receive additional documentation and other factual evidence over the course of this IPR that will allow me to supplement, amend or modify my opinions set forth herein. I reserve the right to supplement, amend, modify, or delete my opinions upon discovery of additional information.

40. In signing this declaration, I recognize that it will be filed as evidence in an IPR proceeding filed before the PTAB. I also recognize that I may be subject

to cross-examination in the case. If cross examination is requested of me, I will appear at a mutually convenient time and place during the time allocated for expert discovery and cross examination.

APPENDIX A

CHRISTOPHER K. WILSON

Redwood City, CA 650.867.2621 Chris@CWcons.com <http://www.linkedin.com/in/cwilson7>

Connected Vehicle & Telematics Consultant – Testifying Expert

I have been developing vehicle telematics and safety systems since 1992, mostly for safety and Advanced Driver Assistance Applications (ADAS). I participated in the early development of key connected vehicle telematics and safety technologies, including radar, positioning, communications, and mapping, worked with many automakers, suppliers, and government agencies, and was involved in the deployment and assessment of many telematics systems from Automatic Collision Notification to systems for Stability Control and Driver Assistance. I also helped set requirements and requirement testing methodologies for many ADAS systems.

I currently work as a consultant for Connected and Automated Vehicle applications (vehicle and infrastructure), and map databases. I am also an expert witness and have written over 40 reports regarding intellectual property and vehicle injury matters and testified 9 times. I am an industry insider with a gift for explaining complicated ideas in a convincing and easy to understand manner.

Expertise in:

- Vehicle Safety & Safety Systems Assessment
- Navigation, Telematics, Data Science
- Radar, camera, & Lidar sensors
- Vehicle & infrastructure interaction
- Remote diagnostics, Sensor & Software Management (OTA updates)
- Vehicle data collection, analysis & applications
- Positioning, communications & mapping technology
- Vehicle & traffic technology and deployment
- Accident Reconstruction

AREAS OF EXPERTISE (with representative dates)

Vehicle Telematics and Safety Systems

- Developed one of the first Automatic Collision Notification systems based on airbag deployment and biomechanical studies. Worked with first responders & ER physicians. 1994.
- Developed systems for the collection and processing of vehicle information for traffic assessment. 1995-2011.
- Algorithms for skid protection and dynamic vehicle control, braking & speed systems. 1999.
- Developed predictive safety systems based on map information, speed control. 1998.
- Developed metrics for regulatory evaluation of active safety systems including Forward Collision Warning, Blind Spot Monitoring, Stop Sign Warning, Curve Speed Warning. 2002.
- Litigation support for Various radar-based safety systems. 2016.
- Telemetry analysis (missiles, spacecraft, ground vehicles). 1981-Present.

Sensors

Radar

- Designed and operated Over-The-Horizon radar. 1984.
- Synthetic Aperture Radar assessment and evaluation. 1989.
- Evaluation of radar algorithms for F16 radar systems (MTI). 1987.

- Automotive radar development for ACC & FCW systems. 1995.
- Assessed various radar-based safety systems. 2002-2017.

Image sensors & algorithms (camera and video)

- Image recognition & processing algorithms for various reconnaissance assets. 1986.
- 3D scene reconstruction from imagery, photogrammetry. 1987, 2017.
- Assessment of image based FCW, AEB and lane following systems. 2002-2016.
- Photogrammetry for HD mapping applications. 2018.

Lidar

- Evaluated and utilized Lidar systems for Forward Collision Warning. 2003.
- Developed Lidar processing applications for mapping. 2008-2018

Communications

- Developed Vehicle-to-vehicle technologies (DSRC). 1999-2016.
- Extensive use and evaluation of cellular communications for vehicles. 1995-2018.
- Use of paging network for emergency services. 1993.
- Developed various vehicle telematics and infotainment systems. 1993-2016
- Evaluation and development of satellite communications systems. 1984-2016.

Positioning

- Evaluation and use of GPS and many high precision enhancements. 1984-2018
- Requirements specification for GPS III and Galileo. 2004.
- Developed precision location techniques for vehicles. 1996-2018.

Maps

- Responsible for 2nd generation map concepts and specifications for industry (HD Maps). 2000.
- Functional safety for map databases. 2016-2018.
- Developed high precision maps for automated vehicles. 1999-2018.
- Developed tools for incremental updates and quality management. 2000-2018.

Vehicle Diagnostics

- Remote diagnostics of powertrains for warranty and repair planning. 2001.
- Monitored infotainment systems to assess driver preferences and system functionality. 2002.
- Diagnostics of driving style for safety and efficiency evaluations. 2012.
- Telemetry diagnostics of air and space vehicles. 1985.

Cooperative Systems

Insurance- Developed methods and tools for peer comparisons to assess driver risk. 2015.

Transportation Operations- Understanding vehicle movements and implications for traffic and signals based on vehicle probes. 1994-2018.

Outreach

- I was the primary instigator and public advocate for vehicle-to-vehicle communications and grew this effort from “can’t be done” to deployment based on my advocacy.
- I have raised money for 4 startups selling a technical vision.
- Park docent leading trips on various nature topics.

PROFESSIONAL EXPERIENCE

Consultant, Intellectual Property and Connected Vehicles.	2012 – Present
ATG Risk Solutions, Seattle, WA	2016 - 2016
VP Bus Dev. (<i>Developing telematics-based risk assessment for Insurance</i>)	
Vehicle Data Science Corporation, Redwood City, CA	2013 - 2016
CEO (<i>Start-up building kinematic maps for automated vehicle applications.</i>)	
TomTom BV, Redwood City, CA	2008 - 2011
Director of Program & Product Mgmt., Advanced Driver Assistance Systems (2009 – 2011)	
Director of R&D (2008 – 2009)	
DaimlerChrysler Research and Technology North America Inc., Palo Alto, CA	1996 - 2008
Vice President, ITS Strategy & Programs (2002 – 2007)	
Group Manager, Telematics & Safety (1998 – 2002)	
Senior Research Scientist (1996-1998)	
Information Access Inc., San Francisco, CA	1995 - 1996
Director of Product Development (1995-1996)	
TRW Inc., Sunnyvale, CA	1986 - 1995
Program Manager (1991 - 1995)	
Senior Systems Engineer (1986 - 1991)	
GTE Government Systems Inc., Mt. View, CA	1983 - 1986
Systems Engineer (1983 - 1986)	

EDUCATION/TRAINING

PhD Candidate (1982), Astrophysics, University of California, San Diego
BA (1981), Physics, Princeton University, Princeton, NJ
 Advanced courses in business, strategy, & technology @ Harvard, Stanford, Berkeley, MIT
 Training in **Software Forensics** (copyright infringement, software theft).
Accident Reconstruction. Certificate from Society of Automotive Engineers. ACTAR certified #3846.

PROFESSIONAL ASSOCIATIONS

Member, Institute of Navigation (ION); Society of Automotive Engineers (SAE); Institute of Transportation Engineers (ITE); Institute of Electrical and Electronics Engineers, Senior Member (IEEE); California Association of Accident Reconstruction Specialists (CA2RS); Accreditation Commission for Accident Reconstruction (ACTAR) #3846, National Association of Professional Accident Reconstruction Specialists.
Board Member, *Inside GNSS* magazine (advisory board); Chair of *IEEE Consultants Network of Silicon Valley*; ITS California (former), Vehicle Infrastructure Integration Consortium (Founding Director, previous); Alliance of IEEE Consultants Network Coordinating Committee (AICNCC).

PATENTS AND PUBLICATIONS

10 US patents in vehicle positioning and vehicle data processing and analytics and numerous foreign patents.

McGraw-Hill *AccessScience* article on “Intelligent Vehicles and Infrastructure”, 2017
Chapter on Probe Data in Springer-Verlag’s *Handbook of Intelligent Vehicles*, 2012
Widely quoted in publications such as Scientific American and Telematics Update
Many presentations to industry groups, often as a representative of the automotive industry.

LITIGATION EXPERIENCE

11 depositions, 30+ IPRs, 50+ expert reports, majority patent related (partial listing).

- Expert for BMW (Finnegan) against navigation system complaint. Few hours consulting. 2012
- Supported primary expert (for TomTom) in technology understanding for invalidity and non-infringement. 2013.
- Expert against OnStar in remote diagnostics case. Developed infringement arguments. Case settled in 2013.
- Expert for Hyundai (Finnegan) in remote diagnostics case. Prepared technology tutorial and multiple IPR declarations. Case settled, 2014.
- Expert for Honda (Jones Day) in remote diagnostics case. Multiple IPR declarations. 2014.
- Expert for Toyota in Telematics/ navigation case. IPR declaration. 2015.
- Expert for BMW on remote data processing case. 2015.
- Expert for BMW (DLA Piper) in vehicle safety technology case (radar, occupant sensing). Invalidity and non-infringement reports, deposition testimony. 2015.
- Expert for Wavetronix (Workman Nydegger) in traffic radar case. IPR declaration, deposition. 2016.
- Expert against LA METRO in HOV reporting case. IPR declaration, deposition. 2016.
- Expert for BMW (DLA Piper) on remote infotainment systems. 2017.
- Expert for Domino’s (DLA Piper, Australia) on fleet monitoring systems. 2017.
- Expert for BMW (DLA Piper) on digital radio systems. 2017.
- Expert for Unified Patents on location-based services. 2017.
- Expert for Velocity v. FCA on vehicle management system. 2018.
- Expert for Unified Patents on map data management and display system. 2018.
- Expert for Blue Dot Systems against Omnitrac on Fleet Management Trade Secrets. 2018
- Expert for MicroMobio on Trademark matter (SuperCruise). 2018.
- Expert on vehicle safety for negligence in personal injury matter. 2019.
- Expert for BMW (DLA Piper) on location-based services patent. 2019.
- Expert for Unified Patents on pairing vehicles with remote devices. 2019.
- Expert for DEI (Cooley) v. ADS in vehicle remote starter patents. 2019.
- Expert for Unified Patents on navigation systems. 2020.
- Expert for BMW (DLA Piper) on connected vehicle systems. 2020.
- Expert for Equipmentshare.com (DLA Piper) on rental equipment remote starter patents. 2021.
- Expert for Unified Patents on pairing vehicles with remote devices. 2021.
- Expert for Tesla on vehicle charging infrastructure. 2022.
- Expert for Unified Patents on infrastructure-based racking systems. 2022.