CHRISTOPHER K. WILSON

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Connected Vehicle & Telematics Consultant – Testifying Expert

I have been developing vehicle telematics systems since 1992, mostly for safety and Advanced Driver Assistance Applications (ADAS). I participated in the early development of key telematics technologies, including positioning, communications and mapping, worked with most automakers, suppliers and government agencies, and have been involved in the deployment of many telematics systems from Automatic Collision Notification to systems for Stability Control and Driver Assistance. I currently work as a consultant for connected vehicle applications (vehicle and infrastructure), and map databases to support automated vehicles.

Expertise in:

- Navigation, Telematics, Data Science
- Radar, camera, & LiDAR sensors
- Vehicle & infrastructure interaction
- Vehicle data collection, analysis & applications
- Positioning, communications & mapping technology
- Vehicle & traffic technology and deployment

SELECTED ACCOMPLISHMENTS

Vehicle Data Interpretation and Analysis

- Founded Vehicle Data Science Corporation developing tools for processing of vehicle probe data to calibrate various vehicle sensors including radar, vision, communication, remote diagnostic and positioning systems. (2013-2016)
- Worked with a top US insurance company to develop algorithms and methods for pricing vehicle insurance based on driver behaviors. Algorithms implemented in premium setting. (2012-2013)
- Managed the development and production of digital map products for automotive ADAS applications meeting the needs of automotive customers, providing map support for radar, vision and other vehicle sensor systems, and enabling entrance to new markets. (2008-2011)
- Developed algorithms and tools to infer map geometry from vehicle probes. Inspired US and European industry-wide projects on mapping technology (EDMap, NEXTMap, $19M combined budget). Concepts cited in justification of TomTom's purchase of TeleAtlas for $4B. (1996-2014)

Navigation, Communications and Safety Application Development (Telematics)

- Coordinated standards for vehicle communications (802.11p) to meet automotive industry requirements. Federal mandate for this technology is in process.
- Developed predictive skid protection, curve warning, and rollover warning system for Mercedes cars and Freightliner trucks (received patent). Increased safety and efficiency of operations.
- Developed the concept of operations for a Cooperative Intersection Collision Avoidance System (CICAS). Worked with vehicle and infrastructure providers to develop and deploy prototype systems. (ca 2005)
- Developed the first off-board navigation system (TRW's In-Vehicle Information System), before cellular and GPS (ca 1995). Today such systems are the norm for smartphones and other devices.
- Designed and developed the first Automatic Collision Notification (ACN) system (ca 1993). Worked with public safety and E-911 officials to recognize and respond to automated callers. Initiated research on biometric crash assessment using airbag occupant sensors and triggering systems to infer crash outcomes. These systems are becoming standard throughout the world.

Vehicle Connectivity Business Models and Initiatives

- Developed business model for deployment of car-to-car/infrastructure communications system (VII). Partnered with US Department of Transportation to refine model and gain consensus of stakeholders including US automotive industry, federal, state and local governments and key suppliers (ca 2003). Current investments in initiative's derivatives are over $100M/year worldwide.
- Identified, modelled and developed markets for historical vehicle data. Worked with vehicle, transportation infrastructure, traffic, insurance, advertising, and emissions management executives to promote and validate concepts (TomTom Advanced Map Content, 2010). Products introduced starting in 2010 and on-going.
- Initiated Vehicle Safety Communications project within automotive industry to validate suitability of vehicle communications technology (DSRC) for safety. Developed business case around vehicle remote diagnostics for Chrysler. Positive results with refinements continuing today (2001). Deployments anticipated in 2017 with mandatory deployment ca. 2020.
- Launched start-up TerraSonance to create consumer demand for connectivity around "Stories of Place" (2007). Concepts currently being further developed by several start-up companies.

PROFESSIONAL EXPERIENCE

Consultant, Intellectual Property and Connected Vehicles. **2012 – Present**

ATG Risk Solutions, Seattle, WA **2016 - 2016**

VP Bus Dev. *(Developing telematics based risk assessment for Insurance)*

Vehicle Data Science Corporation, Redwood City, CA **2013 - 2016**

CEO ***(****Start-up building kinematic maps for automated vehicle applications.)*

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 (1983)**,** Astrophysics**,** University of California, San Diego
BA (1981), Physics, Princeton University, Princeton, NJ
Advanced courses in business, strategy, & technology @ Harvard, Stanford, Berkeley, MIT

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)
Board Member, *Inside GNSS* magazine (advisory board), Vice Chair of *IEEE Consultants Network of Silicon Valley*, ITS California (former), Vehicle Infrastructure Integration Consortium (Founding Director, previous).

PATENTS AND PUBLICATIONS

7 US patents in vehicle positioning and vehicle data processing and analytics, several applications pending 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

3 depositions, 20+ expert reports, majority IPR related, all patent related.

- 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. Prepared multiple IPR declarations. Case settled 2 days before my deposition. 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 vehicle monitoring systems. 2017.
- Expert for BMW (DLA Piper) on digital radio systems. 2017.

- Training in software forensics (copyright infringement, software theft).