

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GOOGLE INC.,  
Petitioner

v.

VISUAL REAL ESTATE, INC.  
Patent Owner

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Cases IPR2014-01341  
Patent 8,078,396

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**RESPONSIVE DECLARATION OF DR. JOHN R. GRINDON**

I, Dr. John R. Grindon, of St. Louis, MO, declare that:

## **INTRODUCTION**

1. On October 4, 2011, I provided a declaration regarding Google's Opening Claim Construction Brief for the Central District of California case *Vederi, LLC v. Google, Inc.*, No. 2:10-cv-07747 (C.D. Cal.), a case in which I analyzed a different patent filed at a different time than the challenged patent in this current IPR proceeding.

2. I have been informed that the Patent Owner in this current IPR proceeding, Visual Real Estate, Inc. (VRE), cited to portions of my previous declaration from the unrelated *Vederi* litigation. Google Inc., the Petitioner in this proceeding, reached out to me to address VRE's characterizations of my earlier declaration, which I have done below. In reviewing VRE's Response documents in this proceeding, my previous declaration from the *Vederi* litigation, and other relevant materials, I have noticed inaccuracies in VRE's statements with regard to the patent at issue in this proceeding, particular prior art references mentioned in VRE's Response documents, and the state of the prior art in 2008, which I also address below.

## **QUALIFICATIONS**

3. I obtained a Bachelor of Science degree in Electrical Engineering from the University of Missouri at Rolla (now Missouri University of Science and

Technology) in 1961, a Master of Science degree in Electrical Engineering from the Massachusetts Institute of Technology in 1962, and a Doctor of Science degree in Electrical Engineering from Washington University in St. Louis in 1970.

4. I have over 40 years of experience in the research, analysis, design and development of electronic systems, devices and software for acquiring, processing, analyzing, communicating and tracking signals and images. This includes experience in the areas of computer graphics, imaging technology, 3D image modeling and sampling, scene analysis and recognition, and correlation of captured images with geographic locations. I have experience in both hardware and software for these systems, including digital, analog and RF design.

5. From 1962 to 1987 I worked at McDonnell Douglas Corporation. My work there included leading project teams in digital image processing research and development for Cruise Missile Guidance, correlation matching of sensed and stored reference images, and automatic target recognition. I also led an engineering research and development team to develop scene analysis algorithms for three dimensional (3-D) imagery for advanced autonomous Cruise Missile Guidance employing imaging laser radars (LIDAR).

6. From 1987 to 1990 I worked at Cencit, Inc., where my work included creating and leading an engineering organization in the research and development

of three-dimensional electronic imaging systems based upon digital video image processing electronics and software algorithms.

7. From 1990 to present I have worked as an independent consultant, consulting for companies on work relating to digital image processing software, calibration of imaging optics, and electronic imaging systems.

8. I am a named inventor on seven United States patents, some of which have related foreign patents and/or patent applications. For example, U.S. Patent Nos. 4,846,577 and 6,373,963 relate to digital image acquisition and processing systems that process and combine images from multiple viewpoints and directions to generate a composite image of an imaged object. A listing of some of my patents and publications is included in my *curriculum vitae*, which is attached as Appendix A to this declaration.

## **OVERVIEW**

9. My analysis set forth in this declaration is informed by my experience in the fields of electrical engineering, computer science and imaging technology. Based on my above-described experience, I believe that I am an expert in these fields.

10. As part of my analysis set forth in this declaration, I have reviewed the disclosure and claims of U.S. Patent No. 8,078,396 (“the ’396 patent”) from the viewpoint of a person of ordinary skill in the art at the time of the earliest possible

priority date of the '396 patent (February 21, 2008) based on my experience in the areas of computer graphics, graphics hardware, computer architecture, and other subjects. Additionally, I have reviewed the following patents, publications, and other materials:

- “An Automated Method for Large-Scale, Ground-Based City Model Acquisition” by Früh et al. (October 2004) (“Fruh”) (Ex. 1004);
- U.S. Patent No. 6,895,126 to Di Bernardo et al. (“Di Bernardo”) (Ex. 1005);
- The Institution Decision in IPR Proceeding IPR2014-01341 (Paper 11);
- The Patent Owner's Response in IPR Proceeding IPR2014-01341 (Paper 21); and
- Declaration of Dr. John R. Grindon in Support of Google's Opening Claim Construction Brief in *Vederi, LLC v. Google, Inc.*, No. 2:10-cv-07747 (C.D. Cal.), D.I. 50-1 (Ex. 2002).

11. In reviewing the above listed materials, I have noticed a number of mischaracterizations and erroneous statements made by VRE with regard to my previous declaration testimony, the claims and specification of the '396 patent, the prior art references mentioned in VRE's Response documents, and the state of the prior art.

12. In my opinion a person of ordinary skill in the art in this field at the relevant time frame (“POSITA”) would have had a combination of experience and education in electrical engineering, computer science, computer graphics, and/or imaging technology. This typically would consist of a minimum of a bachelor degree in electrical engineering, computer science or a related engineering field plus 2-5 years of work and/or research experience in the field of electrical engineering or computer science and the subfield of imaging technology. Based upon my knowledge and experience, I have a good understanding of the capabilities of POSITA in February 2008 and earlier, and I have worked closely with many such persons over the course of my career.

13. Although this Declaration refers to selected portions of the cited references for the sake of brevity, it should be understood that one of ordinary skill in the art would view the references cited herein in their entirety and in combination with other references cited herein and cited within the references themselves. The references used in this Declaration, therefore, should be viewed as being incorporated herein in their entirety.

14. I am not, and never was, an employee of Google Inc. I have been engaged in the present matter to provide my independent analysis of the issues raised by VRE’s Response in the pending *inter partes* review proceeding for the ’396 patent. I received no compensation for this declaration beyond my normal

hourly compensation based on my time actually spent on the matter, and I will not receive any added compensation based on the outcome of this *inter partes* review of the '396 patent.

#### **MISCHARACTERIZATIONS OF MY PREVIOUS TESTIMONY BY VRE**

15. As stated above, I provided an October 4, 2011 declaration in support of Google's Opening Claim Construction Brief for the Central District of California case *Vederi, LLC v. Google, Inc.*, No. 2:10-cv-07747 (C.D. Cal.), a case which does not involve the '396 patent or the Patent Owner (VRE) in this current IPR proceeding. In that previous declaration, I expressed opinions and conclusions based on my analysis of a group of patents in the same family as the Di Bernardo reference (Ex. 1005) from the perspective of a person of ordinary skill in the art in 2000. In that previous declaration, I never analyzed the '396 patent or the state of the prior art in February 2008.

16. The Patent Owner Responses submitted by VRE in this IPR proceeding cite to my prior declaration (Ex. 2002) on several occasions, and in purporting to summarize my prior testimony, VRE in fact mischaracterizes my testimony and overlooks my actual analysis and conclusions with regard to those earlier patents from the same family as the Di Bernardo reference. I point out some of these mischaracterizations and explain the correct context of my prior testimony below.

17. In one example, VRE mischaracterizes my previous testimony by stating that I admitted that Di Bernardo “teaches against adding computational overhead to its system” and “teaches not to perform 3D reconstruction of scenes as being costly and inefficient.” *See* Resp. at pp. 4, 9-10, 19-21 (citing to ¶¶ 39 and 28 of my previous declaration). VRE’s statement and accompanying argument are incorrect for multiple reasons. First, my previous testimony never analyzed the primary teachings of Fruh (from 2004) in view of Di Bernardo’s suggestion for the conventional practice of generating composite images. Second, VRE focuses on a passage from Di Bernardo’s background section (col. 1:61-col.2:5) that specifically refers to prior art practices (apparently considered to be “cumbersome and inefficient” *in 2000*) of generating higher quality composite images based on “dense sampling of images of an object/scene” and “reconstruction of 3D scene geometry,” but for purposes of the obviousness analysis here, VRE’s flawed assumption relates to an irrelevant time frame and ignores the relevant primary teaching. Di Bernardo did not argue against computational complexity in applications that may require or benefit from it, and did not argue that applications requiring or benefitting from computationally complexity should not or could not be achieved. By 2004, Fruh provides straightforward evidence that computational processes related to scene construction (using digital images and laser scan data) were no longer considered cumbersome or inefficient, and a POSITA would have



recognized that this trend was even more apparent by a date as late as February 21, 2008. Accordingly, Di Bernardo's limited discussion of a narrow group of practices related to image quality of the final composite image (as they were understood in 2000 in earlier) might have resulted in Di Bernardo's system (in 2000) sacrificing image quality of a final composite image (Ex. 2002 at ¶ 28), but this does not mean that—by February 2008—a POSITA would have avoided implementing Di Bernardo's suggestion (for generating composite images) in Fruh's system (that already uses camera images along with laser scanners). To the contrary, based upon my knowledge and experience and my review of Fruh and Di Bernardo, I believe that a POSITA would have recognized before February 2008 that Fruh's system was not considered "cumbersome or inefficient" during that time frame and that applying Di Bernardo's then-conventional suggestion (for generating composite images) to Fruh's system (which already uses image data sets including images captured by a digital camera) was a predictable and ordinary task at that time. Additionally, Di Bernardo's disclosure merely indicates that, in particular applications before October 2000 which did not require production of higher quality images, such computational complexity may not have been necessary at the time. But Fruh's teaching already answers the question here by showing that the computational processes for Fruh's system were not considered cumbersome or inefficient by 2004 and later. Based upon my knowledge and

experience and my review of Fruh in view of Di Bernardo, I believe that a POSITA in February 2008 and earlier would have understood that Di Bernardo does not criticize, discredit, or discourage modifying Fruh's system with the then-conventional practice of generating a composite image from image data sets including images captured by a digital camera.

18. Furthermore, my previous declaration testimony (Ex. 2002) in the *Verderi* litigation was premised on the knowledge that a person of ordinary skill in the art would have possessed in October 2000 and earlier (the alleged priority date of the patents in the same family as the Di Bernardo reference). At no point in my prior testimony did I address the primary teachings of Fruh in view of Di Bernardo, for I never performed such an analysis during my work in the earlier *Verderi* litigation. I believe that a POSITA would have understood that these particular processes that Di Bernardo previously considered "computationally intensive" in 2000 and earlier were no longer considered computationally intensive by February 2008 due to drastic and well known improvements in computing power, networking and memory capacity that occurred over that time period. Indeed, the Fruh reference serves as one example of this fact, as its system (using camera scene images and laser scan data) was clearly conventional by 2004 and later. Also, in a second example, one of my personal computers that I still use on occasion includes an MSI K7N2 motherboard available before 2008 and an AMD

Athlon XP3200+ 2GHz processor also available before 2008. I have not run programs based on the teachings of Fruh and Di Bernardo on this system, in my professional opinion it would be well capable of performing the functions described by Fruh and Di Bernardo at satisfactory levels of image quality, resolution, and precision for practical applications. While this computer is just one example of a basic, general purpose personal computer of types that were available before 2008, for example those with Intel, Inc., Pentium processors of comparable processing power, there were also higher-end computers with enhanced graphics processing capability that were available well prior to 2008 which would have been well suited to the tasks described in Fruh and Di Bernardo. For example, before 2008, my engineering team and I used a so-called “work station” made by Silicon Graphics, Inc., for development of image processing and 3D computer graphics algorithms that required intensive computation for processing multiple images taken from different directions, creating 3D models from the images, and compositing them for display and manipulation. Again, Di Bernardo offers a less computationally intensive solution which is acceptable in his proposed application, but Di Bernardo does not teach that more computationally intensive approaches are inadvisable even when beneficial. Quite to the contrary, in the Background of the Invention section, Di Bernardo describes art that is prior to its own 2004 filing and

which does computationally intensive processing for dense sampling and reconstruction of 3D scene geometry. *See* Ex. 1004 at ¶¶ [0007]-[0008].

### **OTHER ISSUES RAISED BY VRE’S PATENT OWNER’S RESPONSE**

19. In reviewing VRE’s Patent Owner Responses in this IPR proceeding, I’ve noticed several other inaccuracies or erroneous assumptions made by VRE that, while not directly related to my previous declaration, are clearly incorrect and thus addressed here.

20. As a first example, VRE asserts that Fruh does not disclose “generating a composite image ... wherein the portions are *aligned* in a dimension consistent with the continuum.” *See* Resp. at pp. 15-17. In particular, VRE erroneously assumes that “in order to align ‘portions’ of multiple two-dimensional image sets, features within the image sets *need to be in common and overlap*,” and then argues that Fruh’s image data includes vertical 2D scans that “are parallel and do not overlap.” *See id.* at pp. 16-17. First, I have reviewed the Board’s Institution Decision that addressed this particular issue, and based upon my knowledge and experience in this field and my review of Fruh, I believe that the Board’s analysis was proper and supported by the Fruh reference. *See* Inst. Dec. at pp. 18-19. For example, Fruh plainly describes a conventional practice of how to “align” the non-overlapping vertical scans using the pose of the laser scans and camera images. Ex. 1004 at p. 6 (“since vertical 2D scans are parallel and do not overlap, ... it is

necessary to determine the pose of successive laser scans and camera images in a global coordinate system with centimeter and sub-degree accuracy in order to reconstruct a consistent model.”). Thus, based upon my knowledge and experience and my review of Fruh, I believe that a POSITA would have recognized that Fruh’s disclosure of generating and texturing a 3-D model by aligning laser scans and camera images using the pose of the laser scans and camera images provides the claimed step of generating a composite image by aligning portions of at least two or more image data sets—meaning that “overlapping” is not always required in order to “align” the portions, especially under the broadest reasonable interpretation standard described in the Board’s Institution Decision.

21. VRE also erroneously assumes that Fruh’s teaching teaches away from “vision-based technology” of Di Bernardo because Fruh discloses challenges associated with implementing “purely” vision-based methods. *See* Resp. at pp. 19-22; Ex. 1004 at pp. 5-6 (discussing “purely” vision-based technologies). This limited discussion of “purely” vision-based technology for generating 3D building models is notably different than VRE’s broad assertion that Fruh disparages implementing any vision-based technology in Fruh’s system (which uses both vision-based technology combined with laser scan data). Based upon my knowledge and experience and my review of Fruh and Di Bernardo, I believe that a POSITA would have understood before February 2008 that Fruh does not

disparage or criticize implementing all types of vision-based technology for generating composite images in a system for 3D modeling of a geographic location. To the contrary, a POSITA would have recognized that Fruh specifically provides for implementing vision-based technology, e.g., a digital camera, to acquire image data (Ex. 1004 at p. 6), and thus Fruh does not criticize, discredit, or discourage generating a composite image based on image data sets including images captured by Fruh's digital camera.

#### **ADDITIONAL REMARKS**

22. I currently hold the opinions expressed in this declaration. But my analysis may continue, and I may acquire additional information and/or attain supplemental insights that may result in added observations.

23. 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 were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of the Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this proceeding.

Dated: 9-1-15 By: John Grindon

John R. Grindon, D.Sc. of St. Louis, MO

# John R. Grindon, D.Sc. Curriculum Vitae

## Professional Summary

Dr. Grindon has more than 40 years of experience in the research, analysis, design and development of electronic systems, devices and software for acquiring, processing, analyzing, communicating and tracking signals and images. He is experienced in both hardware and software for these systems, including digital, analog and RF design. His doctoral research is in signal processing. He holds issued US and foreign patents in these areas.

He holds advanced degrees in Electrical Engineering from M.I.T. and from Washington University in St. Louis.

## Summary of Areas of Expertise

- Digital Image and Video Acquisition, Processing and Analysis
- 3D Imaging
- Digital Signal Processing (DSP)
- Electronics and Electronic Systems
- Wireless Communications and Radar
- Navigation, Tracking and Position Location
- Pattern Matching and Classification
- RF Systems, Circuitry and Antennas
- Mathematical Modeling and Analytical Sciences

## Education

<i>Year</i>	<i>University</i>	<i>Degree</i>
1970	Washington University in St. Louis	Doctor of Science (D.Sc.), Electrical Engineering.
1962	Massachusetts Institute of Technology	Master of Science (S.M.), Electrical Engineering
1961	University of Missouri at Rolla	Bachelor of Science (B.S.), Electrical Engineering

Continued Education:

- Continued education via credit and noncredit courses, workshops, seminars and self-study.

## Professional Experience

From: 1990  
To: Present  
Organization: John R. Grindon & Associates  
Title: Independent Consultant  
Summary: 

- Consultant to 3D3 Solutions of Vancouver, BC, for digital image processing software algorithm development for 3D measurement systems, including optical system calibration, position location and orientation. Consultant to Hoffman Patent Firm of Scottsdale, AZ, performing patent analyses and evaluations. Consultant to

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Beroe, Inc., of Chennai, India, on electronic sensors. Engineering consultant to Cyra Technologies, Inc., San Ramon, CA, a division of Leica Geosystems, for laser scanning, imaging and ranging systems to digitize 3D shapes of objects.

- Engineering consultant to [TC]<sup>2</sup> Corporation of Cary, NC, for development of an optical, electronic imaging system for digitizing the 3D shape of imaged objects. This system combines data from multiple, spatially-referenced digital video cameras. A patent was awarded for this work.

From: 1987  
To: 1990  
Organization: Cencit, Inc.  
Title: Executive Vice President and Director of Research  
Summary: 

- Created and led an engineering organization at Cencit, Inc., a startup company engaged in the research and development of three-dimensional electronic imaging systems based upon digital video image processing electronics and software algorithms.
- Developed the concept and led the design and implementation of a three-dimensional computer vision system for non-contact shape digitization, and a computer-controlled four-axis DNC milling machine to replicate physical models of scanned objects. This equipment senses and digitizes the 360-degree surface of an object without physical contact by acquiring and processing digital video images taken by multiple cameras surrounding the object. The system then automatically controls the milling machine to produce a scaled three-dimensional replica from the digitized shape data. This work included development of calibration algorithms for determining internal camera parameters, for mutual alignment of the cameras, and for removal of lens distortion. U.S. and foreign Patents were awarded.

From: 1962  
To: 1987  
Organization: McDonnell Douglas Corporation  
Title: Branch Chief - Electronics, and other positions  
Summary: 

- Led project teams in digital image processing research and development for Cruise Missile guidance, correlation matching of sensed and stored reference images, and automatic target recognition.
- Managed a software development and flight test program to develop mathematical models for statistically predicting tracking and guidance accuracy for the Tomahawk Cruise Missile using an on-board terrain-sensing radar and on-board stored digital terrain maps.
- Led an engineering research and development team to develop scene analysis algorithms for three-dimensional (3-D) imagery for advanced autonomous Cruise Missile guidance employing imaging laser radars (LIDAR).
- Conceived an approach and managed a project team to develop automatic target



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classification and recognition algorithms for anti-ship missiles using an on-board infrared imaging device, operating in the presence of noise, sea-clutter and countermeasures.

- Performed research and developed a new class of image processing algorithms for autonomous Cruise Missile location and guidance, using infrared (IR) imaging sensors to automatically recognize scenes based upon correlation of the sensed IR images with stored data models, employing an entropy algorithm.
- Invented a new system for detecting and accurately locating the positions of ground-based communications radio frequency (RF) transmitters through a method employing digital signal processing and methods of triangulation and statistical estimation. Similarly as GPS but with signal transmission in the reverse direction, this method accurately measures differences in signal arrival times and Doppler frequency shifts of signals received at multiple receivers aboard moving vehicles, which are used to determine the position location of the ground-based transmitter.
- Secured and led a series of research and development projects for the Department of Defense to analyze and develop systems including algorithms and electronics for locating the positions of ground-based communications radio frequency (RF) transmitters based upon signal time of arrival (TOA) technology.
- Developed a design methodology, computer aided engineering software, and RF hardware design for wide dynamic range, multi-octave, communications signal intercept receivers for defense applications. This receiver design methodology has particular application for use in systems employing time-of-arrival processing methods for position location and tracking wherein signal propagation delay must be preserved over a wide dynamic range and over a wide range of frequencies.
- Secured R&D grants, performed research and developed a new method to detect and locate covert spread-spectrum radio frequency signals, by correlating signals received at spaced antennas on the wings of an aircraft. These types of signals are used to hide radio communications beneath the noise and clutter of the frequency spectrum.
- Designed electronics for an onboard aircraft collision avoidance system, including the design of signal processing circuitry. This system, which was used to protect multiple fighter aircraft flying in the same airspace, transmits signals using time division multiple access (TDMA) in a coordinated fashion among the aircraft, measuring propagation times and Doppler frequency shifts. This information is processed on board to assess collision threats, warn the pilot, and indicate evasive maneuvers.
- Designed digital data communication modulator/demodulator (MODEM) for air-to-ground wireless communications using an efficient coding method.
- Developed digital RF frequency synthesizer for wireless communications receiver applications.
- Developed an electronic device for accurate measurement of relative velocities between aircraft by measuring the Doppler frequency shift of microwave signal pulses transmitted between aircraft in allocated time slots.

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- Designed a multi-path and clutter-tolerant omni-directional direction finding system for pulsed microwave signals employing a new type of multimode antenna (described below). Awarded a patent on this work.
- Performed pioneering research and co-designed a microwave direction finding antenna employing a waveguide cavity within which multiple electromagnetic field modes are generated by an arriving signal. Parameters of these electromagnetic modes depend upon the signal's direction of arrival. Upon receiving a signal pulse transmitted by an aircraft, these electromagnetic modes are sensed, electronically resolved and processed in real time to determine and display the position of the aircraft in range and azimuth.
- Performed research and received a patent on a new method of generating single-sideband signals for RF communications transmitters and frequency synthesizers, based upon combining RF signals that are differentially phase shifted in accordance with a modulating signal, thereby suppressing unwanted spectral products, or sidebands.
- Developed a new intermediate frequency (IF) amplifier design for pulsed-signal receivers for preserving radio frequency phase information over a wide dynamic range, for applications in phase-sensitive direction-finding and Doppler frequency shift measurement systems.
- Performed research and developed an electronic solution to the problem of mutual electromagnetic interaction, or unwanted coupling, among antennas on aircraft. The solution employs modeling the aircraft as an element in the RF electromagnetic system. Using this mathematical model, designed RF circuitry to decouple the antennas, thereby preventing mutual electromagnetic interference.

From: 1961  
To: 1962  
Organization: Massachusetts Institute of Technology Research Laboratory of Electronics (R.L.E.)  
Title: Graduate Student  
Summary: Designed microwave electronics for M.I.T.'s radio telescope.

From: 1961  
To: 1961  
Organization: Hughes Aircraft Corporation  
Title: Engineer  
Summary: Designed microwave electronics for field testing high-powered ground-based military radars.

From: 1960  
To: 1960  
Organization: Westinghouse Electric Corporation

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Title: Engineer  
Summary: Designed RF electronics for military radar systems.

### Litigation Support Experience

Matters in which Dr. Grindon has testified at trial, deposition or in a hearing, and matters in which he has prepared declarations and expert reports, since 2008:

#### *Expert Engagement:*

Type of Matter: Patent infringement and validity litigation  
Law Firm: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., Washington DC  
Case Name: Trover Group, Inc. v. Axis Communications, Inc. (Sweden); Case No. 2:13-cv-1125-WCB, United States District Court for the Eastern District of Texas, Marshall Division.  
Services Provided: Expert services on behalf of defendant Axis Communications regarding patent concerning security systems employing video imaging and image processing hardware and software. Prepared expert report.  
Disposition: Closed  
Date: 2014 – 2015

#### *Expert Engagement:*

Type of Matter: Patent *Inter Partes* Reviews  
Law Firm: McAndrews, Held & Malloy LTD, Chicago, Illinois  
Case Name: Stryker Corporation, Petitioner, v. Karl Storz Endoscopy – America, Patent Owner; IPR Numbers 2015-00674; 2015-00675; USPTO Patent Trial and Appeal Board.  
Services Provided: Expert services on behalf of Petitioner Stryker Corp. regarding patents concerning video imaging cameras and systems. Prepared declarations; deposed.  
Disposition: Open  
Date: 2013 – Present

#### *Expert Engagement:*

Type of Matter: Patent infringement litigation  
Law Firm: Perkins Coie, LLP  
Case Name: Transcenic, Inc., v. Google, Inc., et al., Case No. 11-582-LPS (U.S. District Court for Delaware)  
Services Provided: Expert services on behalf of defendant Google regarding imaging systems. Prepared expert reports; deposed.  
Disposition: Closed  
Date: 2012 – 2015

#### *Expert Engagement:*

Type of Matter: Patents *Inter Partes* Reviews  
Law Firm: Wood, Herron & Evans, LLP, Cincinnati, Ohio  
Case Name: K-40 Electronics, LLC, v. Escort, Inc., of Cincinnati Ohio, *Inter Partes* Reviews,

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Patent Trial and Appeal Board, USPTO Case Nos. IPR 2013-00233, IPR 2013-00240  
Services Provided: Expert Services on behalf of patent owner Escort, regarding microwave radar detection and GPS tracking systems. Prepared declarations; deposed.  
Disposition: Inactive  
Date: 2014 – Present

*Expert Engagement:*

Type of Matter: Patent litigation and *Inter Partes* Review  
Law Firm: Akin Gump Strauss Hauer and Feld, LLP, Washington DC  
Case Name: View 360 Solutions v. Google, Inc., CA No. 1:12-cv-1352-GTS-TWD.  
Services Provided: Expert services on behalf of defendant Google regarding imaging systems. Prepared expert declarations in *Inter Partes* Review.  
Disposition: Inactive  
Date: 2013 – Present

*Expert Engagement:*

Type of Matter: Patent infringement and validity litigation  
Law Firm: Mayer Brown, LLP, Washington DC  
Case Name: Impulse Technology v. Microsoft, et al., CA No. 11-586-RGA-CJB.  
Services Provided: Expert services on behalf of Plaintiff regarding patent validity. Prepared expert report; deposed.  
Disposition: Open  
Date: 2012 – Present

*Expert Engagement:*

Type of Matter: Patent infringement and validity litigation  
Law Firm: Ropes & Gray, LLP, Palo Alto, California, and New York, New York  
Case Name: Vederi v. Google, Inc.  
Services Provided: Expert services on behalf of defendant Google regarding imaging systems. Prepared expert reports and declarations.  
Disposition: Closed  
Date: 2011 – 2012

*Expert Engagement:*

Type of Matter: Patent infringement and validity ITC investigation  
Law Firm: Birch, Stewart, Kolasch & Birch, LLP, Falls Church, Virginia  
Case Name: American GNC v. Furuno, Investigation No. 337-TA-738, United States International Trade Commission.  
Services Provided: Expert services on behalf of defendant Furuno regarding marine navigation systems employing GPS. Prepared expert reports.  
Disposition: Closed  
Date: 2010 – 2011

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*Expert Engagement:*

Type of Matter: Patent infringement and validity litigation  
Law Firm: Finnegan, Henderson, Farabow, Garrett and Dunner, LLP, Reston, Virginia  
Case Name: Hy-Ko Products v. Hillman Group, Civil Action No. 5:08-CV-1961 (Dowd),  
United States District Court for the Northern District of Ohio, Eastern Division.  
Services Provided: Expert services on behalf of Hillman regarding electronic imaging, image  
processing and object identification systems. Prepared expert reports and  
declarations; deposed twice.  
Disposition: Closed  
Date: 2010 – 2012

*Expert Engagement:*

Type of Matter: Patent infringement and validity litigation; *Inter Partes* Reexaminations; *Inter Partes* Review  
Law Firm: Law Offices of Steven G. Lisa, Ltd., Chicago, Illinois  
Case Name: Helferich v. New York Times, Civil Action No. 1:10-cv-04387, United States  
District Court for the Northern District of Illinois Eastern Division; also various  
*Inter Partes* Reexaminations, and *Inter Partes* Reviews before the USPTO  
Patent Trial and Appeal Board.  
Services Provided: Expert services on behalf of plaintiff / respondent Helferich regarding wireless  
communications and messaging systems. Prepared declarations; deposed twice  
in *Inter Partes* Review.  
Disposition: Inactive  
Date: 2010 – 2014

*Expert Engagement:*

Type of Matter: Patent infringement and validity litigation  
Law Firm: Grippo & Elden, LLP, Chicago  
Case Name: Snap-On v. Bosch, Case No. 09-cv-6914, United States District Court for the  
Northern District of Illinois Eastern Division.  
Services Provided: Expert services on behalf of plaintiff Snap-On regarding optical, digital imaging  
and analysis systems for automotive wheel alignment using multiple aligned  
digital video cameras and calibrated targets for 3D sensing of wheel alignment  
parameters. Prepared consulting reports.  
Disposition: Inactive  
Date: 2009 – Present

*Expert Engagement:*

Type of Matter: Patent infringement and validity litigation  
Law Firm: Wood, Herron & Evans, LLP, Cincinnati, Ohio  
Case Name: Fleming v. Escort Inc. and Beltronics USA Inc., Case No. 1:12-cv-0066-BLW,  
United States District Court for the District of Idaho, Boise.  
Services Provided: Expert Services on behalf of defendants Escort and Beltronics, regarding  
microwave radar detection system. Deposed; prepared expert declarations and  
reports. Testified in Federal District Court regarding claim construction; testified  
at trial.

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Disposition: Closed  
Date: 2009 – 2012

*Expert Engagement:*

Type of Matter: Product liability litigation  
Law Firm: Jose, Henry, Brantley, MacLean & Alvarado, LLP, Fort Worth, TX  
Case Name: Wade v. McKee, Draeger Safety, and Draeger Safety Diagnostics, Case No. 067-234341-08, District Court for the 67<sup>th</sup> Judicial District, Tarrant County, TX.  
Services Provided: Expert Services on behalf of plaintiff Wade regarding electronic sensing, control and safety interlock device for automotive use. Prepared expert report.  
Disposition: Closed  
Date: 2009 – 2010

*Expert Engagement:*

Type of Matter: Patent validity and infringement litigation  
Law Firm: Irell & Manella, LLP, Los Angeles, California  
Case Name: Avago Technologies v. Elan Microelectronics Corp. and Elan Information Technology Group, Case No. C 04-05385 JW (HRL), United States District Court for the Northern District of California, San Jose.  
Services Provided: Expert services on behalf of plaintiff Avago on patent validity regarding digital imaging, image processing, position determination and motion tracking for an optical computer mouse. Analyzed position tracking using reflections from laser illuminators. Prepared expert reports; deposed three times. Prepared to testify at jury trial and supported counsel during trial.  
Disposition: Closed  
Date: 2007 – 2011

*Expert Engagement:*

Type of Matter: Patent validity and infringement litigation  
Law Firm: Ropes & Gray LLP, New York, New York  
Case Name: Olympus Corp. v. Given Imaging Ltd. (Israel); Case No. 06-02132, United States District Court for the Eastern District of Pennsylvania.  
Services Provided: Expert services on behalf of Given Imaging regarding digital video imaging capsule endoscopes. Prepared expert reports.  
Disposition: Closed  
Date: 2007 – 2008

### Professional Affiliations, Achievements & Awards

- Member, Institute of Electrical and Electronics Engineers
- Member, Society of Manufacturing Engineers
- Member, Sigma Xi (Graduate Research Honorary, M.I.T.)
- Member, Eta Kappa Nu (Electrical Engineering Honorary)

## John R. Grindon, D.Sc. Curriculum Vitae

- Member, Tau Beta Pi (Engineering Honorary)
- Member, Phi Kappa Phi (Scholastic Honorary)
- IEEE Outstanding Electrical Engineering Senior Award
- Westinghouse Achievement Scholarship
- Graduated with First Honors (first in Electrical Engineering)
- Hughes Master's Fellowship, M.I.T.

### Patents & Publications

<u>US Patent</u>	<u>Date</u>	<u>Description</u>
6,373,963	2002	Systems, Methods and Computer Program for Measuring the Surface Contour of an Object
4,871,256	1989	Means for Projecting Patterns of Light
4,846,577	1989	Optical Means for Making Measurements of Surface Contours
3,634,673	1972	Radio Direction Finder Signal Processing Means
3,559,106	1971	Modulator That Develops and Reinforces One Sideband While Developing and Attenuating a Second Sideband

Also other patents.

### Publications

1. Grindon, John R., and co-authors, "Body Measurement System using White Light Projected Patterns for Made-to-Measure Apparel," The International Society for Optical Engineering, SPIE Proceedings Vol. 3131, July 1997.
2. Grindon, John R., and co-authors, "Three-Dimensional Surface Capture for Body Measurement using Projected Sinusoidal Patterns," Photonics West / Electronic Imaging 97, The International Society for Optical Engineering, SPIE Proceedings Vol. 3023, February, 1997.
3. Grindon, John R., "Non-Contact 3-D Surface Digitization of the Human Head," Proceedings of the National Computer Graphics Association, NCGA 89, April, 1989.

Also other publications.

### Contact Information

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**John R. Grindon, D.Sc.**  
**Curriculum Vitae**

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