

Filed on Behalf of Novarad Corp.

By: Joseph Harmer
Jed Hansen
Thorpe North & Western, LLP
175 S. Main St., Ste. 900
Salt Lake City, UT 84111
Tel: (801) 566-6633

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDIVIS, INC.,

Petitioner,

v.

NOVARAD CORP.,

Patent Owner.

Patent 11,004,271 B2

Case IPR 2023-00042

**PATENT OWNER'S OPPOSITION TO
PETITIONER'S MOTION TO EXCLUDE**

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EXHIBIT LIST

Exhibit No.	Exhibit Description
Ex. 2002	Declaration of Mahesh S. Mulumudi, M.D. (“Mulumudi”)
Ex. 2003	Dr. Mulumudi C.V.
Ex. 2004	Declaration of Craig Rosenberg, Ph.D. (“Rosenberg”)
Ex. 2005	Dr. Rosenberg C.V.
Ex. 2006	Dr. Kazanzides Deposition (“Kazanzides Depo”)
Ex. 2007	Dr. Rosenberg Supplemental C.V.
Ex. 2008	Dr. Rosenberg Supplemental Declaration
Ex. 2009	Dr. Mulumudi Supplemental Declaration

I. INTRODUCTION

Medivis has manufactured new expert requirements and reargues the merits of its Petition under the ruse of a Motion to Exclude (“Motion”) [Paper 25] expert testimony. Medivis’ Motion should be denied.

Medivis defines the person of ordinary skill in the art (POSITA) as a person having:

- (1) a bachelor’s degree in computer science, electrical engineering, or a related field with
- (2) several years of experience in the design, development, and study of augmented reality devices; and
- (3) either (a) familiar[ity] with conventional medical imaging data and visualization of data for medical procedures or (b) working with a team including someone with such familiarity.

Mulumudi and Rosenberg meet all three of these requirements. In the case at hand, the POSITA includes more than one discipline, *i.e.*, augmented reality and visualization of medical imaging data for medical procedures. While both Rosenberg and Mulumudi are qualified POSITAs under Medivis’ definition, Rosenberg provides the Board with a specialized understanding of augmented reality. And Mulumudi provides the Board with the perspective of an actual medical doctor who uses medical imaging data and visualization of that data for

medical procedures. Their testimony will help the Board to understand the evidence and to determine the facts at issue.

Detailed more fully below, Rosenberg provides the Board with the valuable understanding of an augmented reality engineer with over 30 years of experience. *See* Ex. 2004, Rosenberg Dec., ¶¶ 13, 16. And Mulumudi provides the Board with the critical understanding of an actual medical doctor with over two decades of “experience in imaging, virtual reality, augmented reality with biofeedback, and treating peripheral vascular and coronary artery diseases from 2000 through today.” Ex. 2002, Mulumudi Dec., ¶ 13. Indeed, Mulumudi is the only expert with “[e]xtensive expertise in utilizing [2D and 3D] ultrasound guidance for safe vascular access, facilitating entry into arteries and veins, and navigating medical equipment securely to the desired implantation site or area of interest.” Ex. 2003, Mulumudi CV, 1; Ex. 2009, Mulumudi Supp. Dec., 3.

Medivis ignores these facts in an improper attempt to reargue the merits of the case. A motion to exclude should be limited to the admissibility of testimony, not its weight. *See* 37 C.F.R. § 42.64; USPTO, Consolidated Trial Practice Guide (“TPG”), 79, (Nov. 2019) (“A motion to exclude must explain why the evidence is not admissible (e.g., relevance or hearsay) but may not be used to challenge the sufficiency of the evidence or to provide a particular fact.”).

II. ARGUMENT

A. The Level of Skill in the Art is a Factual Determination.

The level of ordinary skill in the art at the time of the invention is a factual determination....” *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citations omitted). The Board is the finder of fact and has not yet determined the level of skill in the art nor is it bound by Medivis’ proposed definition. *See Hanwha Solutions Corp. et al v. Rec Solar PTE. LTD.*, IPR2021-00988, Paper 40 at 11-12 (P.T.A.B. Dec. 9, 2022) (deciding that Petitioner’s proposal is too broad and Patent Owner’s proposal is too narrow and adopting its own definition).

The level of ordinary skill in the art is a “lens” through which the Board views the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2011). The POSITA is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, the Board may consider factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field. *Id.* The “lens” of the level of ordinary skill in the art does not change a prior art’s disclosure, though it may change one’s understanding of what is

disclosed.” *Metrasens, Inc. et al. v. Keith A. Kopp*, IPR2022-01224, Paper 21 at 8 (P.T.A.B. Dec. 21, 2023).

B. Standard for the Admissibility of Expert Testimony in an IPR.

To qualify as an expert under FRE 702, an expert must have the “scientific, technical, or other specialized knowledge [that] will help the trier of fact to understand the evidence or to determine a fact at issue.” “There is [] no requirement of a perfect match between the expert’s experience and the relevant field.” TPG, 34 (citing *SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010)). “[A]ny perceived mismatch between the qualifications of [Patent Owner’s] experts and the level of ordinary skill is not a basis to discount their testimony” so long as the testimony “is helpful to the Board ... and the ‘the expert’s experience provides sufficient qualification in the pertinent art.’” *Eisai Inc. v. Crystal Pharm. (Suzhou) Co., Ltd.*, PGR2021-00047, Paper 58 at 10 (P.T.A.B. Aug. 8, 2022) (quoting TPG, 34).

Moreover, challenges to an expert’s qualifications go to the weight of the evidence, not its admissibility. See *Intel Corp. v. Alacritech, Inc.*, IPR2017-01406, Paper 83 at 42-43 (P.T.A.B. Nov. 26, 2018); *Primera Tech, Inc. v. Automatic Mfg. Sys., Inc.*, IPR2013-00196, Paper 50 at 30 (P.T.A.B. Jul. 17, 2014). “The Board has broad discretion to assign weight to be accorded expert testimony.” TPG, 35. “[T]he wholesale exclusion of witness’s declarations is rarely called for in a

proceeding before the Board” because “the policy considerations for excluding expert testimony ... are less compelling in bench proceedings such as *inter partes* reviews than in jury trials.” *Les Ateliers Beau-Roc Inc. v. Air Power Sys. Co.*, IPR2020-01702, Paper 32 at 60 (P.T.A.B. Apr. 18, 2022) (citation omitted).

C. Dr. Mulumudi is Qualified to Offer Opinions Regarding the '271 Patent and Should Not Be Excluded.

1. Dr. Mulumudi is Qualified as an Expert.

There is no basis for excluding Mulumudi’s testimony because he has more than the requisite ordinary skill in the art and his testimony is undoubtedly helpful in deciding the disputed factual issues. Mulumudi is a medical doctor, a field that is unquestionably related to the '271 Patent. Ex. 2002, Mulumudi Dec., ¶¶ 16-24. He is “very familiar with conventional medical imaging data and visualization of that data for use during medical procedures.” Ex. 2009, Mulumudi Supp. Dec., ¶ 6. He has “over 20 years of experience treating peripheral vascular and coronary artery diseases using 2D and 3D medical imaging, including ‘3D Ultrasound, gated Computerized Tomography (CT), and Magnetic Resonance Imaging (MRI).’” *Id.*, ¶ 6. Mulumudi is “[p]roficient in medical image processing techniques and manipulation techniques to determine the appropriate sizing of values and other devices, ensuring precise anatomical placement.” Ex. 2003, Mulumudi CV, 1. He has “[e]xtensive expertise in utilizing [2D and 3D] ultrasound guidance for safe

vascular access, facilitating entry into arteries and veins, and navigating medical equipment securely to the desired implantation site or area of interest.” Ex. 2003, 1; Ex. 2009, Mulumudi Supp. Dec., ¶ 6.

Mulumudi also has “several years of experience in the design and development of virtual and augmented reality environments.” Ex. 2009, ¶ 7. Mulumudi “created a VR enhanced telemedicine solution designed to enhance remote healthcare delivery by providing an immersive and realistic experience.” Ex. 2002, Mulumudi Dec., ¶ 23; Ex. 2009, ¶ 7. He also “recently submitted a U.S. Patent Application for an innovative VR application that leverages biofeedback to offer mindfulness exercises aimed at reducing stress and enhancing focus.” Ex. 2009, ¶ 7.

Mulumudi is also “a named inventor of several U.S. Patents.” *Id.*, ¶ 8. Two of Mulumudi’s patents relate to a “guidewire insertion tool configured to measure a length of an anatomic region” in order to “accurately position surgical devices in the body.” *Id.*; *see* U.S. Patent Nos. 11,311,306 and 10,271,763. Six of Mulumudi’s patents are related to an “acoustic collection system [e.g., stethoscope] for handheld electronic devices [e.g., smartphones and tablets]” and a “mounting system” for such acoustic collection systems. *Id.*; *see* U.S. Patent Nos. 10,271,816; 9,855,019; 9,706,975; and 9,414,155.

In his Declaration (Ex. 2002), Mulumudi explained, “I believe I am qualified to serve as a technical expert in this proceeding based on my educational and work experience, including my 20+ years of experience in imaging, virtual reality, augmented reality with biofeedback, and treating peripheral vascular and coronary artery diseases from 2000 through today.” Ex. 2002, ¶ 13. He also testified, “The combination of my education, research, training, and work experience in cardiovascular health and virtual reality technology in healthcare as it relates to improving the patient experience enables me to provide analysis and opinions on the subject matter of this litigation.” *Id.*, ¶ 26.

2. Medivis’ Attempts to Undermine Dr. Mulumudi’s Testimony Lack Merit.

Medivis’ criticisms of Mulumudi lack merit. Motion, ¶¶ 10-12. Medivis argues that Mulumudi’s “medical degree is not the required degree in computer science, electrical engineering, or a related field.” Motion, 10. However, Mulumudi’s medical degree is in a field of study unquestionably related to the ’271 Patent. Moreover, while Mulumudi is not a computer science or electrical engineering major, these undergraduate degrees would not alter his opinion. Mulumudi disagreed that “a POSITA necessarily requires a degree in computer science or electrical engineering.” Ex. 2009, Mulumudi Supp. Dec., ¶ 5.

Mulumudi observed that “the ’271 Patent does not disclose new hardware, but new software” (*id.*), as Petitioner acknowledged. *See* Petition, 4-5.

Medivis also argues that Mulumudi “relies on his own say-so.” Motion, 11. Medivis contends that Mulumudi “cited no support for [his] allegations about DVR or anything else.” Motion, 11. This argument lacks merit. Mulumudi provided an overview of various ways that medical imaging data is visualized, including: slice-by-slice viewing, multiplanar reconstruction (MPR), surface rendering, and direct volume rendering (DVR). Ex. 2002, Mulumudi Dec., ¶¶ 51-58. Mulumudi also explained why the ’271 Patent requires direct volume rendered 3D data. *Id.*, ¶¶ 59-62. Mulumudi repeatedly cites to the ’271 Patent as support for his opinions [*see, e.g., id.*, ¶ 59] which is explained more fully in Patent Owner’s Response and Sur-reply. *See, e.g.*, Response, 11-14; Sur-reply, 9-10.

Other than Medivis’ general allegations that Mulumudi’s opinions on DVR are unsupported, Medivis points to only one portion of one sentence in Mulumudi’s Declaration—his opinion that “‘virtual 3D shape’ is derived from direct volume rendering.” *Id.* (citing Ex. 2002, ¶ 78). However, Medivis’ quotation of Mulumudi is incomplete. Mulumudi said:

A POSITA would understand that a ‘virtual 3D shape’, in the context of the ’271 Patent, is more than a 3D appearance of an object. The ‘virtual 3D shape’ is derived from direct volume rendering the detail of the object and may extend beyond the outer layer or [] any inner layer defining the course of anatomical structures confined within it. This definition is of importance

when a surgeon or a proceduralist is operating on a patient's anatomy allowing for precision and proper positioning of required surgical instruments in relation to surrounding structures.

Ex. 2002, Mulumudi Dec., ¶ 78. Medivis' provides no other evidence that Mulumudi's opinions are unsupported. Moreover, **it provides no evidence from its own expert to rebut any of Mulumudi's testimony.** Medivis' failure in this regard speaks volumes. Unable to present a single sentence of rebuttal testimony from its own expert, it resorts to a strained reading of its POSITA definition in an effort to eliminate that testimony.

Medivis also alleges that "Mulumudi admitted that he could identify DVR only by the words "direct volume rendering." Motion, 12 (citing Ex. 1022, 129:17-130:1). Medivis made this same argument in its Reply. Reply, 3-4. Medivis' allegation here, as in its Reply, lacks candor. During Mulumudi's deposition, Medivis' counsel showed Mulumudi page 49 of *Amira*. The page from *Amira* contains text with no images. Counsel then asked Mulumudi, "Is there any way that you could tell whether the volume rendering referenced on page 49 of *Amira* is direct volume rendering without the words 'direct'—the phrase 'direct volume rendering' being used?" To which, Mulumudi simply answered, "No." See Ex. 1022, 129:17-130:1. Medivis references Ex. 1005 at, e.g., 6/18-7/19, 37/49-39/51 in its Motion, but **Medivis did not show Mulumudi any figures**

from these pages during his deposition. It is misleading, at best, to suggest to the Board that Medivis did so.

Lastly, Medivis manufactures new POSITA qualifications. Specifically, Medivis argues that unfamiliarity with *3D Slicer* (Ex. 1010), *3D Visualization* (Ex. 1007) (a *3D Slicer* presentation), and *Amira* (Ex. 1005) disqualifies Mulumudi as a POSITA. Motion, 1, 6, 10. Medivis presumes that every POSITA must be familiar with Exhibits 1005, 1007, 1010. But knowledge of any of the products allegedly shown in those exhibits is not a condition that Medivis ever claimed was required to be a POSITA. It cannot create them now.

Irrespective, Mulumudi's testimony is consistent with the evidence. During his deposition, Mulumudi explained that he was "not confident to say that these are widely used tools by [a] wide variety of medical personnel." Ex. 2020, 147:15-19. *3D Visualization* states that "Slicer is a tool for research and is not FDA approved." Ex. 1007, 8. And *Amira* states, "Amira ® is intended for research use only. It is not a medical device." Ex. 1005, 4. This does not mean that Mulumudi "admitted that he is unqualified to discuss the prior art technology," as Medivis contends. Motion, 7. Rather, it is probative of the fact that Medivis' assertions of patent invalidity are uncorroborated by experts in the field and lack merit.

D. Dr. Rosenberg is Qualified to Offer Opinions Regarding the '271 Patent Should Not Be Excluded.

1. Dr. Rosenberg is Qualified as an Expert.

Medivis had the opportunity—but declined—to depose Dr. Rosenberg. *See Les Ateliers Beau-Roc*, IPR2020-01702, Paper 32 at 60 (“any shortcomings” in “the qualifications of an expert witness” are supposed to be explored “through cross-examination”). Remarkably, Medivis now seeks to exclude the opinions for which it declined to cross-examine Dr. Rosenberg.

There is also no basis for excluding Rosenberg’s testimony because he has more than the requisite ordinary skill in the art and his testimony is undoubtedly helpful to the Board. Rosenberg has a BS in Industrial Engineering, a MS in Human Factors, and a PhD in Human Factors. Ex. 2004, Rosenberg Dec., ¶ 16. Rosenberg has over 30 years of experience in “human factors, user interface design, user interaction design, human-computer interaction, and software engineering from 1988 through today.” *Id.*, ¶ 13. “For 30 years, [Rosenberg has] worked in human factors, user interface design, software development, software architecture, systems engineering, and modeling and simulation across application areas, including aerospace, communications, entertainment, **and healthcare.**” Ex. 2004, ¶ 16. (emphasis added). Rosenberg unquestionably meets all of the requirements of a POSITA related to the ‘271 Patent.

2. Medivis’ Attempts to Undermine Dr. Rosenberg Lack Merit.

Medivis’ criticisms of Rosenberg lack merit. Motion, 12-15. Medivis contends that Rosenberg’s “degrees are not in computer science, electrical engineering, or a related field.” Motion, 12. Medivis’ contention lacks candor. Rosenberg’s BS in Industrial Engineering, MS in Human Factors, and a PhD in Human Factors are clearly fields of study related to the ’271 Patent. *See* Ex. 2004, Rosenberg Dec., ¶ 16. As stated above, Rosenberg has “worked in human factors, user interface design, software development, software architecture, systems engineering, and modeling and simulation across application areas, including aerospace, communications, entertainment, and healthcare” for over 30 years. *See Id.* Rosenberg has experience with “application prototyping ... object-oriented software architecture, graphical user interface analysis and design, as well as UML, C++, C#, and Java software development. Ex. 2007, Rosenberg Supp. CV, 1.

Medivis also contends that Rosenberg lacks the required AR device experience. Motion, 12. This contention lacks merit. Rosenberg has “several years of experience the design, development, and study of augmented reality environments—however, not necessarily augmented reality devices.” Ex. 2008, Rosenberg Supp. Dec., ¶ 5. Rosenberg explains, “Although the ’271 Patent claims the use of an augmented reality headset, the focus of the claims is more about software than hardware.” *Id.* Rosenberg has authored several relevant

publications, including a book chapter on augmented reality displays in the book, ‘Virtual Environments and Advanced Interface Design’ (Oxford University Press, 1995).” Ex. 2004, ¶ 19; *see* Ex. 2007, Rosenberg Supp. CV, 3-4. He “received an award from the Link Foundation for [his] work furthering the field of virtual interface design.” Ex. 2007, Rosenberg CV, 2. Moreover, Rosenberg has “worked on a significant number of patent litigation cases, several of which were related to virtual and augmented reality,” including: *ARCzar v. Nintendo* (AR); *Glasses.com v. Ditto* (AR); *Lennon v. Sephora* (AR); *RPX v. Virtual Immersion Technologies* (VR); *Princeton Digital Image Corporation v. Harmonix Music Systems* (VR); *Princeton Digital Image Corporation v. Konami Digital Entertainment* (VR); *Barbaro v. Niantic* (VR); *Worlds, Inc. v. Linden Labs* (VR); and *Utherverse v. Epic Games* (VR). *See* Ex. 2004, Rosenberg Dec., ¶ 34; *see also* Ex. 2007, 4-5.

Medivis also contends that Rosenberg lacks familiarity with conventional medical imaging data. Motion, 12. Rosenberg stated that he is “not an expert in the specifics of medical imaging,” but that is not required to be a POSITA here. Rosenberg need only have “**either** (a) familiar[ity] with conventional medical imaging data and visualization of data for medical procedures **or** (b) working with a team including someone with such familiarity.” (Emphasis added). He has both. Rosenberg is familiar with medical imaging data and visualization of data for medical procedures and has worked with a team including medical professionals

familiar with conventional medical imaging data. Rosenberg is a “Cofounder of a medical startup company creating an innovated case for smartphones that turns it into a digital stethoscope for enhanced diagnosis, serial comparisons, and telemedicine.” Ex. 2007, Rosenberg CV, 1. He is also the Cofounder a second medical startup company “leveraging wearable technologies such as Good Glass and Apple Watch to allow physicians to much more easily interact with their electronic medical records.” *Id.*

Medivis also contends that Rosenberg “construed the claim terms ‘three-dimensional (3D) data’ and ‘inner layer of the patient’ as requiring specific medical imaging.” Motion, 14-15. Leaning further into its argument, Medivis continues to state that Rosenberg is not an expert in “medical imaging” and so he cannot opine on what these terms mean. Medivis misconstrues the record.

With respect to the term “three-dimensional (3D) data...”, Rosenberg noted “I am not an expert in the specifics of medical imaging. However, based on the plain and ordinary meaning of the ‘three-dimensional (3D),’ a POSITA would understand that that image projected onto the patient in an AR environment must at least appear to the user to have height, width, and depth.” Ex. 2004, Rosenberg Dec., ¶ 79. With respect to the term “inner layer(s) of the patient,” Rosenberg said, “Again, based on the plain language of the claim, a POSITA would understand that the image projected onto the patient in an AR environment, whether the complete

3D dataset or some subset, appears to the user to have height, width, and depth.”

Id., ¶ 80. Medivis’ contention that Rosenberg construed these claims “as requiring specific medical imaging,” lacks candor.

Finally, Medivis accuses Rosenberg of cognitive bias and constructing “a non-existent claim term.” Motion, 14-15. This is not a basis for exclusion. A “motion to exclude is not a vehicle for addressing the weight to be given evidence—arguments regarding weight should appear only in the merits documents.” TPG 79. Medivis’ accusation also lacks merit. Medivis contends that Rosenberg constructed “being confined within ... a virtual 3D shape” instead of “being confined within **a volume of** a virtual 3D shape.” (Emphasis added); *see* Motion, 14. Medivis’ contention is specious. A 3D shape has a volume. “Within a 3D shape” is therefore synonymous with “within a volume of a 3D shape.”

III. CONCLUSION

For the foregoing reasons, Medivis’ Motion should be denied.

Dated: January 9, 2024

/s/ Joseph Harmer

Joseph Harmer

U.S. Patent Reg. No. 77,649

Jed H. Hansen

U.S. Patent Reg. No. 59,106

Attorney for Patent Owners Novarad Corp.

THORPE NORTH & WESTERN LLP

Case IPR 2023-00042
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175 South Main, Suite 900
Salt Lake City, Utah 84111
Telephone: 801-566-6633
Email: joseph.harmer@tnw.com

CERTIFICATE OF COMPLIANCE PURSUANT TO 37 C.F.R. §42.24

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing
**PATENT OWNER'S OPPOSITION TO PETITIONER'S MOTION TO
EXCLUDE** complies with the typeface requirements of 37 C.F.R. §42.6(a)(ii) and
the style requirements of 37 C.F.R. §§42.6(a)(iii) and (iv). This document contains
15 pages or less, excluding the parts exempted as provided in 37 C.F.R. §
42.24(a)(1)(v).

/s/ Joseph Harmer

Joseph Harmer

U.S. Patent Reg. No. 77,649

Jed H. Hansen

U.S. Patent Reg. No. 59,106

*Attorney for Patent Owners Novarad
Corp.*

THORPE NORTH & WESTERN LLP

175 South Main, Suite 900

Salt Lake City, Utah 84111

Telephone: 801-566-6633

Email: joseph.harmer@tnw.com

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a correct copy of this Patent Owner Sur-Reply was served upon the Petitioner on January 9, 2024, by email to the email addresses identified in Petitioner's Updated Mandatory Notices dated February 2, 2023:

kfreeman@mccarter.com

ebelt@mccarter.com

jcurran@mccarter.com

Dated: January 9, 2024

/s/ Kaelynn Moultrie
Kaelynn Moultrie