

# United States Court of Appeals for the Federal Circuit

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THE NIELSEN COMPANY (US), LLC,  
*Appellant*

v.

TVISION INSIGHTS, INC.,  
*Appellee*

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2025-1371

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Appeal from the United States Patent and Trademark  
Office, Patent Trial and Appeal Board in No. IPR2023-  
01014.

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Decided: August 14, 2026

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CLIFFORD T. BRAZEN, Erise IP, P.A., Overland Park,  
KS, argued for appellant. Also represented by JENNIFER C.  
BAILEY.

CHRISTOPHER SCOTT PONDER, Sheppard Mullin Richter  
& Hampton LLP, Menlo Park, CA, argued for appellee.  
Also represented by HARPER BATTS, JEFFREY LIANG.

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DYK and REYNA, *Circuit Judges*, and BISSOON, *Chief District Judge*.<sup>1</sup>

DYK, *Circuit Judge*.

TVision Insights, Inc. (“TVision”) petitioned for inter partes review of U.S. Patent No. 11,470,243 (“243 patent”), owned by The Nielsen Company (US), LLC (“Nielsen”). TVision relied on a publication authored by Ying-li Tian (“Tian”) as a prior-art reference. The Patent Trial and Appeal Board (“Board”) determined each challenged claim to be unpatentable under 35 U.S.C. § 103 as obvious over prior art combinations that included Tian. Nielsen appeals, arguing that the Board erred in concluding that Tian was analogous art and in finding that Tian’s teachings rendered obvious the disputed claims. We affirm.

#### BACKGROUND

The ’243 patent, titled “Methods and Apparatus to Capture Images,” “relates generally to audience measurement and, more particularly, to methods and apparatus to capture images.” ’243 patent title, col. 1 ll. 37–39. The specification discloses embodiments that include an “audience measurement device for measuring and/or identifying an audience of [a] media presentation device” such as a television. *Id.* at col. 4 ll. 54–56 (reference numbers omitted). The patent discloses an “example audience measurement device” that uses a camera to capture images of an audience while identifying the media content being shown to the audience members. Images may be processed by a “people counter” that counts audience members by the presence of human features such as heads and faces. *Id.* at col. 5 l. 47–col. 6 l. 2. The patent discloses that the people counter may use low-resolution images. Images may

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<sup>1</sup> Honorable Cathy Bissoon, Chief District Judge, United States District Court for the Western District of Pennsylvania, sitting by designation.

also be processed by a “person identifier” that compares detected faces with facial signatures to identify audience members. *Id.* at col. 6 ll. 3–44. According to the patent, the person identifier requires high-resolution images. Nielsen recognizes that “[a]t the time of the invention, it was common for audience measurement systems to employ facial recognition to identify the people watching the program” and contends that the alleged invention is directed to using unilluminated low-resolution images to determine whether audience members were positioned suitably and using illuminated high-resolution images to perform facial recognition. Appellant’s Br. 2–4.

TVision filed a petition for inter partes review of the ’243 patent, challenging the patentability of fourteen claims. Nielsen disclaimed the three challenged independent claims in its Patent Owner Preliminary Response, and the Board instituted review of dependent claims 4–6, 8, 11–14, and 18–20 (the “challenged claims”). Claims 4–6 are the focus of this appeal.<sup>2</sup> Claim 4 of the ’243 patent recites an “audience measurement system to obtain exposure data for a media exposure environment” comprising “processor circuitry to execute . . . machine readable instructions” to “reduce a resolution of a first image of the one or more of the images of the media exposure environment to obtain a reduced-resolution image, and determine the orientation of

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<sup>2</sup> Each challenged claim recites limitations similar to claim 4, requiring “reduc[ing] a resolution of a first image” and “determin[ing] the orientation of the head . . . based on the reduced-resolution image.” ’243 patent claim 4; *see id.* claims 5–6, 8, 11–14, 18–20. On appeal, Nielsen does not provide independent argument for claims 8, 11–14, and 18–20, but appears to challenge the Board’s unpatentability determination of all claims based on the common resolution-reducing limitations of claim 4. Claims 5 and 6 include other limitations.

the head with respect to the camera based on the reduced-resolution image.” ’243 patent claims 1, 4. Claims 5 and 6, which depend from claim 4, also recite “(i) generating a facial signature from a region of a second image of the one or more of the images corresponding to a location of the head in the reduced-resolution image, and (ii) comparing the generated facial signature to a database of facial signatures.” *Id.* claims 5, 6.

Before the Board, TVision asserted two grounds of unpatentability, arguing that the challenged claims were obvious over various prior-art references in view of Tian. In the first ground of the petition, TVision relied on U.S. Patent Application Publication No. 2002/0059577 to Lu et al., published May 16, 2002 (“Lu”), in combination with Tian. In the second ground, TVision relied on U.S. Patent Application Publication No. 2010/0274372 to Nielsen et al., published October 28, 2010 (“Nielsen-372”), and U.S. Patent Application Publication No. 2010/0066822 to Steinberg et al., published March 18, 2010 (“Steinberg”), in combination with Tian.

Tian is a scientific publication titled “Evaluation of Face Resolution for Expression Analysis.” Tian disclosed experimental results evaluating the performance of facial expression analysis steps using images of faces at “lower resolution” that “are down-sampled from the originals.” J.A. 955. In its petition, TVision asserted that “Tian is in the same field of endeavor as the ’243 patent, which is media analysis.” J.A. 225.<sup>3</sup> In its response, Nielsen disputed that Tian was analogous art, arguing that Tian was neither in the same field of endeavor nor reasonably pertinent to the ’243 patent.

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<sup>3</sup> Citations to “J.A.” refer to the Joint Appendix filed by the parties. Dkt. No. 18.

On January 6, 2025, the Board issued a final written decision, concluding that Tian was reasonably pertinent analogous art to the '243 patent (without reaching the field-of-endeavor prong) and finding all challenged claims to be unpatentable on both obviousness grounds. Nielsen timely appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

## DISCUSSION

### I

Nielsen first argues that the Board erred in considering Tian because, contrary to the Board, Tian was not analogous art to the '243 patent.

### A

Two tests define the scope of analogous art: “(1) whether the art is from the same field of endeavor” and “(2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.” *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). “The Board’s determination that a prior art reference is analogous art presents an issue of fact, reviewed for substantial evidence.” *In re Klein*, 647 F.3d 1343, 1347 (Fed. Cir. 2011).

Nielsen first contends that the Board violated the Administrative Procedure Act (“APA”) in concluding that Tian was reasonably pertinent because the petition argued only that Tian was in the same field of endeavor as the '243 patent, not that Tian’s teachings were reasonably pertinent. According to Nielsen, it had no notice or opportunity to respond to the reasonably pertinent theory. “A patent owner in [an IPR] is undoubtedly entitled to notice of and a fair opportunity to meet the grounds of rejection” under the APA. *Qualcomm Inc. v. Intel Corp.*, 6 F.4th 1256, 1262 (Fed. Cir. 2021) (alteration in original) (quoting *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1080 (Fed. Cir. 2015)).

We see no error in the Board’s addressing the question of reasonable pertinence, and the requirements of the APA were satisfied for three independent reasons.

First, while the same-field and reasonably pertinent theories are “separate tests,” *Bigio*, 381 F.3d at 1325, we have cautioned against an “unduly rigid view of the analogous art framework” and explained that “the evidence and analysis relating to the field of endeavor and reasonably pertinent prongs may overlap.” *Netflix, Inc. v. DivX, LLC*, 80 F.4th 1352, 1360 (Fed. Cir. 2023). Relevant to both prongs, TVision’s expert, Dr. Doermann, opined that Tian disclosed “analyzing images for head detection and pose estimation.” J.A. 688 ¶ 36. As in *Netflix*, the reasonably pertinent prong overlaps with the field-of-endeavor prong in this case, and the same evidence was germane to both prongs. *See Netflix*, 80 F.4th at 1360.

There is also no requirement for a petitioner’s analogous-art theory to be made expressly; such a theory may be implicit in the petition. *Corephotonics, Ltd. v. Apple Inc.*, 84 F.4th 990, 1004 (Fed. Cir. 2023) (“[T]he pertinence of the prior art to the problem solved by the invention may be implicit in the petition’s discussion of the challenged claims and why a person of ordinary skill would be motivated to combine the prior art references with a reasonable expectation of success.”). “[T]he Board may make its own finding as to the field of endeavor or problem confronted by the inventors—when those issues are in dispute—even if its finding differs from the positions argued for by the parties.” *Id.* at 1011. The reasonably pertinent prong was implicit in the petition. TVision argued that Tian and the ’243 patent belonged to the same field of endeavor because Tian teaches “analyzing images for head detection and pose estimation.” J.A. 688 ¶ 36. We conclude that Nielsen was on notice that the reasonably pertinent prong was also in play.

Second, Nielsen was not deprived of the opportunity to address reasonable pertinence. It responded to TVision’s

analogous-art argument in the Patent Owner's Response by addressing both the field-of-endeavor and reasonably pertinent prongs. J.A. 2058–61.

Finally, “[t]he judicial review provision of the APA includes a harmless error rule.” *ZyXEL Commc’ns Corp. v. UNM Rainforest Innovations*, 107 F.4th 1368, 1382 (Fed. Cir. 2024) (quoting *In re Chapman*, 595 F.3d 1330, 1338 (Fed. Cir. 2010)); see 5 U.S.C. § 706(2) (“[D]ue account shall be taken of the rule of prejudicial error.”). Nielsen concedes that it does not identify any evidence or arguments that it was deprived of the opportunity to present had it been more explicitly put on notice that the Board would consider the reasonably pertinent prong. Oral Arg. at 1:21–28. Because Nielsen has not established prejudice, any error was harmless.

We conclude that the Board did not violate the APA.

## B

Nielsen also disputes the merits of the Board's conclusion that Tian was reasonably pertinent analogous art to the '243 patent. “Whether a prior art reference qualifies as analogous prior art is a question of fact that we review for substantial evidence.” *Netflix*, 80 F.4th at 1358 (citing *Bigio*, 381 F.3d at 1324). “A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem.” *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992). “[T]he reasonably pertinent inquiry may consider where an ordinarily skilled artisan would reasonably look, and what that person would reasonably search for, in seeking to address the problem confronted by the inventor.” *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1382–83 (Fed. Cir. 2019).

The question is whether substantial evidence supports the Board’s determination of the problem identified in the ’243 patent. The Board determined that the ’243 patent was “directed to problems in image processing and, particularly, to problems in facial detection and analysis.” J.A. 23. Nielsen disagrees, arguing the ’243 patent provided an “express definition of the problems facing its inventor.” Appellant’s Br. 40. According to Nielsen, the expressly defined problems were the “[f]requent activation of the illumination sources,” which causes “significant power drain,” “shortens [the] lifetime of the illumination source,” causes a “significant amount of heat generat[ion],” and “annoy[s] people” in the audience. ’243 patent col. 3 ll. 4–16. Nielsen also urges that the problems confronting the inventor are limited to those expressly referenced in the patent specification, and that the Board’s analysis must be “tethered to” what “the challenged patent identifies [as] the problems facing the inventor.” Appellant’s Br. 38–39.

The problems confronting an inventor are not limited to those expressly identified in a patent, and a patent may be directed to multiple problems. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007) (“[T]he problem motivating the patentee may be only one of many addressed by the patent’s subject matter.”); *Donner Tech., LLC v. Pro Stage Gear, LLC*, 979 F.3d 1353, 1359 (Fed. Cir. 2020) (identifying the relevant question to be “whether [a prior art reference] is reasonably pertinent to *one or more of the particular problems* to which the [challenged] patent relates” (emphasis added)). A patent may address explicitly identified specific problems while also addressing general problems. *See In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1380 (Fed. Cir. 2007); *Innovention Toys, LLC v. MGA Ent., Inc.*, 637 F.3d 1314, 1322 (Fed. Cir. 2011). Here, though the specification identifies certain drawbacks to the overuse of a light source, ’243 patent col. 3 ll. 4–16, the



challenged claims address broader problems and do not recite a light source.<sup>4</sup> It would be inappropriate to limit the relevant problem to reducing light-source use when the claims themselves are not limited to the presence of a light source and are far broader than responding to the light-source problems Nielsen identifies. *See KSR*, 550 U.S. at 419 (“In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim.”).

In any event, the Board did not need to look beyond the patent itself. There is ample support for the Board’s identification of “problems in image processing, and, particularly, . . . problems in facial detection and analysis.” J.A. 23. Each claim recites the analysis of camera images. *E.g.*, ’243 patent claim 1 (reciting processor circuitry executing instructions to “analyze a sequence of images of the media exposure environment”). The title of the patent is “Methods and Apparatus to Capture Images.” *Id.* at title. The background section of the specification discusses how “some measurement systems capture a series of images” and “identify people in the images” using “facial recognition.” *Id.* at col. 1 l. 56–col. 2 l. 3. The specification thus recognizes that the patent is directed to image processing and facial recognition. The disclosures of the ’243 patent are thus substantial evidence supporting the Board’s determination that the patent is concerned with problems of image processing, particularly facial detection.

Tian “logically would have commended itself to an inventor’s attention in considering” the identified problems of image processing and facial detection. *See Clay*, 966 F.2d at 659. “If a reference disclosure and the claimed

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<sup>4</sup> Only two dependent claims make any reference to an “illumination source.” ’243 patent claims 24–25. These claims were not challenged by TVision.

invention have a same purpose, the reference relates to the same problem, which supports an obviousness rejection.” *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001 (Fed. Cir. 2016).

Tian “explores the effects of different image resolutions for each step of facial expression analysis.” J.A. 955. TVision’s expert, Dr. Doermann, testified that Tian disclosed “analyzing images for head detection and pose estimation.” J.A. 688 ¶ 36 (opining that Tian was within the same field of endeavor as the ’243 patent). The Board determined that Tian was reasonably pertinent because Tian, like the ’243 patent, was “directed to problems in image processing and, particularly, to problems in facial detection and analysis.” J.A. 23.

The Board’s determination is supported by substantial evidence. Like the challenged claims of the ’243 patent, Tian disclosed facial analysis methods that produce high rates of successful facial detection even with low-resolution images. Tian “has a same purpose” as the ’243 patent, *see Unwired Planet*, 841 F.3d at 1001, and Tian’s methods would “logically . . . have commended [themselves] to an inventor’s attention,” *see Clay*, 966 F.2d at 659.

We conclude that substantial evidence supports the Board’s reasonable-pertinence finding and its determination that Tian is analogous art.

## II

Nielsen contends that, even if Tian were analogous art, Tian failed to render obvious the challenged claims of the ’243 patent. “We review the Board’s obviousness determination de novo and its underlying factual determinations for substantial evidence.” *Rai Strategic Holdings, Inc. v. Philip Morris Prods. S.A.*, 92 F.4th 1085, 1092 (Fed. Cir. 2024).

## A

Nielsen contends that Tian failed to disclose the limitations of claim 4 (and hence the limitations of claims 5 and 6, which depend from claim 4). Claim 4 recites processor circuitry to execute instructions to “reduce a resolution of a first image of the one or more of the images of the media exposure environment to obtain a reduced-resolution image, and determine the orientation of the head with respect to the camera based on the reduced-resolution image.” ’243 patent claim 4.

First, Nielsen argues that Tian failed to disclose reducing a resolution. The Board determined that Tian disclosed reducing the resolution of facial images by down-sampling based on Tian’s description of obtaining “Original” resolution images from a database and that “lower resolution images are down-sampled from the originals.” J.A. 29–31 (citing J.A. 955, 959). Nielsen contends that Tian’s “generic teaching” of down-sampling alone fails to satisfy claim 4. Appellant’s Br. 55–56. Nielsen effectively argues that claim 4 requires pixel “binning,” which is the resolution-reducing technique disclosed in the ’243 patent as suitable for audience measurement. The specification describes binning as a method to improve contrast by summing the signals in a block of pixels, increasing contrast at the expense of resolution. ’243 patent col. 11 ll. 5–18. But claim 4 recites “reduc[ing] a resolution” and is not limited to binning, and Tian disclosed reducing a resolution by the different method of down-sampling. This is sufficient to satisfy the resolution-reducing step.

According to Nielsen, claim 4 also requires “that only a first image in an image sequence has its resolution reduced within the broader approach to audience identification claimed.” Appellant’s Br. 56. Nielsen relatedly argues that claim 4 requires that the resolution-reducing step must be performed as part of a facial analysis method, not prior to facial analysis. Nielsen contends that Tian does not satisfy

these two requirements because it taught reducing resolution for all images of an image sequence prior to analysis.<sup>5</sup>

Nielsen is wrong on the merits, so we need not decide whether the issues were raised before the Board. Claim 4 imposes no requirement that “only” the first image must be reduced in resolution, nor that the reduced-resolution step must not be performed before facial analysis.

Nielsen also argues that Tian failed to teach the limitations of claims 5 and 6. Claims 5 and 6 depend from claim 4 and additionally recite what Nielsen describes as a “two-step facial recognition process,” Appellant’s Br. 59, which includes “(i) generating a facial signature from a region of a second image of the one or more of the images corresponding to a location of the head in the reduced-resolution image, and (ii) comparing the generated facial signature to a database of facial signatures,” ’243 patent claims 5–6.

Nielsen argues that Tian failed to disclose the two-step facial-recognition process required by claims 5 and 6 because the two-step process requires reducing the resolution of a first image but performing facial recognition on a second image without reducing its resolution, while Tian disclosed only reducing resolution and identifying features within the same reduced-resolution image. There is no merit to Nielsen’s contention that claims 5 and 6 require a “reduced-resolution” first image for initial face detection (people-counting) and “full-resolution” second image for facial recognition (person-identification). Nielsen’s argument that claims 5 and 6 require a full-resolution second image is predicated on the same premise it argued for

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<sup>5</sup> Nielsen also reframes the same argument as a motivation-to-combine issue, arguing that the combination would not satisfy the claim requirements. *See* Appellant’s Br. 72–73.

claim 4: that *only* the first image in a sequence must be reduced-resolution. As with claim 4, claims 5 and 6 impose no such requirement.

The Board assumed that the recited second image was not limited to a full-resolution image and credited TVision's expert testimony that "Tian teaches determining a face/head location in a first image and only tracking changes to face features in subsequent images" and concluded that Tian discloses the two-step process. J.A. 52–53 (quoting J.A. 700). We see no error in the Board's conclusion, as it is consistent with Tian's explicit disclosure that a "face detector" may "detect [a] face in the first frame and then track the face in the remainder of [a] video sequence." J.A. 955.

## B

Nielsen also argues that the Board erred by finding motivation to combine Tian with the other prior-art references in TVision's two asserted grounds. Nielsen contends that "TVision's evidence does not suggest that the facial recognition relied on by [Lu] and Nielsen-372 were needlessly resource-consuming" so that there was no motivation to combine for greater efficiency. Appellant's Br. 6.

As to the Lu/Tian ground, the Board credited TVision's expert testimony that Lu's "face detection can be resource-consuming," J.A. 48 (quoting J.A. 704 ¶ 69), and agreed that combining Lu with Tian "would prevent wasteful facial recognition processing of unsuitable images," J.A. 47. As to the Nielsen-372/Steinberg/Tian ground, the Board similarly credited TVision's evidence that applying "Tian's facial analysis techniques" to Nielsen-372 and Steinberg "would have . . . provided savings in processing resources and time." J.A. 71–72 (quoting J.A. 293).

Dr. Doermann testified that face detection may be resource-intensive and that "processing resources and time can be reduced if the resolution of the image is reduced,"

citing a scientific publication and two patent disclosures. J.A. 704 ¶ 69 (citing J.A. 1131, 1141, 1153). Dr. Doermann provided evidence that reducing processing time was a known motivation in face detection and that Tian explained how to perform face detection on reduced-resolution images without sacrificing accuracy. J.A. 704–05 ¶ 69; J.A. 843–44 ¶ 287. This is substantial evidence supporting the Board’s motivation-to-combine determination on both the Lu/Tian and Nielsen-372/Steinberg/Tian grounds. “[U]niversal’ motivations known in a particular field to improve technology provide ‘a motivation to combine prior art references *even absent any hint of suggestion* in the references themselves.’” *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023) (emphasis in original) (quoting *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797–99 (Fed. Cir. 2021)).

#### CONCLUSION

We conclude that substantial evidence supports the Board’s finding that Tian is analogous art to the ’243 patent, and the Board did not err in concluding that the challenged claims of the ’243 patent were unpatentable.

#### AFFIRMED