

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

ADVANCED CODING TECHNOLOGIES, LLC,
Patent Owner.

Case IPR2024-00374
Patent 8,090,025

**PETITIONER'S REPLY TO
PATENT OWNER'S PRELIMINARY RESPONSE**

EXHIBITS

- SAMSUNG-1001 U.S. Patent No. 8,090,025 to Sakazume (“the ’025 Patent”)
- SAMSUNG-1002 Excerpts from the Prosecution History of the ’025 Patent (“the Prosecution History”)
- SAMSUNG-1003 Declaration and Curriculum Vitae of Dr. Reader
- SAMSUNG-1004 Complaint, *Advanced Coding Technologies LLC v. Samsung Electronics Co., Ltd. et al.*, 2:22-cv-00499-JRG, E.D. Tex., filed December 30, 2022
- SAMSUNG-1005 Al-Mualla, et al., “Video Coding for Mobile Communications: Efficiency, Complexity and Resilience,” Elsevier, 2002 (Mualla)
- SAMSUNG-1006 S. Shirani, et al., “A Concealment Method for Video Communications in an Error-Prone Environment,” in *IEEE Journal on Selected Areas in Communications*, vol. 18, no. 6, pp. 1122-1128, June 2000 (Shirani)
- SAMSUNG-1007 N. Saito, et al., “The Polyharmonic Local Sine Transform: A New Tool for Local Image Analysis and Synthesis without Edge Effect,” *Applied and Computational Harmonic Analysis*, vol. 20, pp. 41-73, January 2006 (Saito)
- SAMSUNG-1008 B. Girod, et al., “Feedback-Based Error Control for Mobile Video Transmission,” in *Proceedings of the IEEE*, vol. 87, no. 10, pp. 1707-1723, Oct. 1999 (Girod)
- SAMSUNG-1009 T. Stockhammer, et al., “H.264/AVC in Wireless Environments,” in *IEEE Trans. on Circuits and Systems for Video Tech.*, vol. 13, no. 7, July 2003 (Stockhammer)
- SAMSUNG-1010 Perez, et al., “Poisson Image Editing,” *ACM, ACM Transactions on Graphics (TOG)*, vol. 22, Issue 3, Jul. 2003, pp. 313-318 (Perez)

- SAMSUNG-1011 Wexler, et al., “Space-Time Video Completion,” In Proc. IEEE Comput. Soc. Conf. Computer Vision and Pattern Recognition, 2004, pp. 120 –127 (Wexler)
- SAMSUNG-1012 Raskar, et al., “Image Fusion for Context Enhancement and Video Surrealism,” Proceedings of the 3rd Symposium on Non-Photorealistic Animation and Rendering, 2004, pp. 85-152 (Raskar)
- SAMSUNG-1013 Sun, et al., “Poisson Matting,” ACM Transactions on Graphics (Tog), Special Issue: Proceedings of the 2004 Siggraph Conference Session: Interacting With Images, vol. 23, Issue 3, 2004, pp. 315-321 (Sun)
- SAMSUNG-1014 U.S. Patent No. 7,636,128 B2 to Sun, et al. (Sun-128)
- SAMSUNG-1015 Fattal, et al., “Gradient Domain High Dynamic Range Compression,” In Proceedings of ACM SIGGRAPH, 2002, 249–256 (Fattal)
- SAMSUNG-1016 ITU-T Rec. H.263 (01/2005) (“the H.263 standard”)
- SAMSUNG-1017 M. Wada, “Selective Recovery of Video Packet Loss Using Error Concealment,” IEEE Journal on Selected Areas of Communication, vol. 7, pp. 807–814, June 1989 (Wada)
- SAMSUNG-1018 Declaration of June Munford
- SAMSUNG-1019 Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Director’s Guidance”)
- SAMSUNG-1020 Samsung Stipulation letter regarding IPR grounds in District court litigation.
- SAMSUNG-1021 ITU-T Rec. H.263 (02/1998)
- SAMSUNG-1022 List, et al., “Adaptive Deblocking Filter,” IEEE Journal on Circuits and Systems for Video Technology, vol. 13, pp. 614-619, July 200 (List)
- SAMSUNG-1023 Transcript of Board call held May 21, 2024

SAMSUNG-1024 Sun, et al., “Concealment of damaged block transform coded images using projection onto convex sets,” IEEE Trans. Image Processing, vol. 4, pp. 470–477, Apr. 1995 (Sun-2)

SAMSUNG-1025 Kwok, et al., “Multi-directional interpolation for spatial error concealment,” IEEE Trans. Consumer Electron., vol. 39, pp. 455–460, Aug. 1993 (Kwok)

The Board should reject Patent Owner's ("ACT's") arguments advanced in the POPR and grant institution.

I. THE PETITION ESTABLISHED THAT THE COMBINATION OF MUALLA, SHIRANI, AND SAITO SATISFIES THE AGREED-UPON CONSTRUCTION OF "BORDER MOTION VECTOR DATA"

Patent Owner ("ACT") alleges that Shirani does not satisfy the construction agreed to in district court for "border motion vector data" ("*data representing the difference in spatial position between a border of the block to be predicted in the picture to be coded and the best-matched border in the reference picture*").

POPR, 31-34. On the contrary, the embodiments of Shirani mapped in the Petition satisfy this construction. As established in the Petition, both Mualla and Shirani describe two-stage hybrid error concealment, where the 1st stage utilizes "temporal concealment" to obtain an initial estimate of a missing block ("*the block to be predicted in the picture to be coded*") by using information from the previous frame ("*the reference picture*"). Pet., 34-36, 59-62; SAMSUNG-1005, 246-250; SAMSUNG-1006, 2-3, Fig. 1(a). Shirani provides details of this 1st stage, which obtains "motion vectors" representing a spatial "displacement" ("*data representing the difference in spatial position*") between (i) smaller-sized subblocks u_1 , u_2 , l_1 , l_2 adjacent to each border of the missing block ("*a border of the block to be predicted in the picture to be coded*") and (ii) corresponding smaller-sized subblocks u_1' , u_2' , l_1' , l_2' in the previous frame that minimize the border errors

(“and the best-matched border in the reference picture”). Pet., 34-36;

SAMSUNG-1006, 3, Fig. 1(a). Shirani defines “border error” in “terms of pixels,” including “bottom line pixels of the block to the top of the missing block” and “right column pixels of the block to the left of the missing block” and pixels adjacent to “the subblocks ... to the right and below of the missing block.” *Id.*

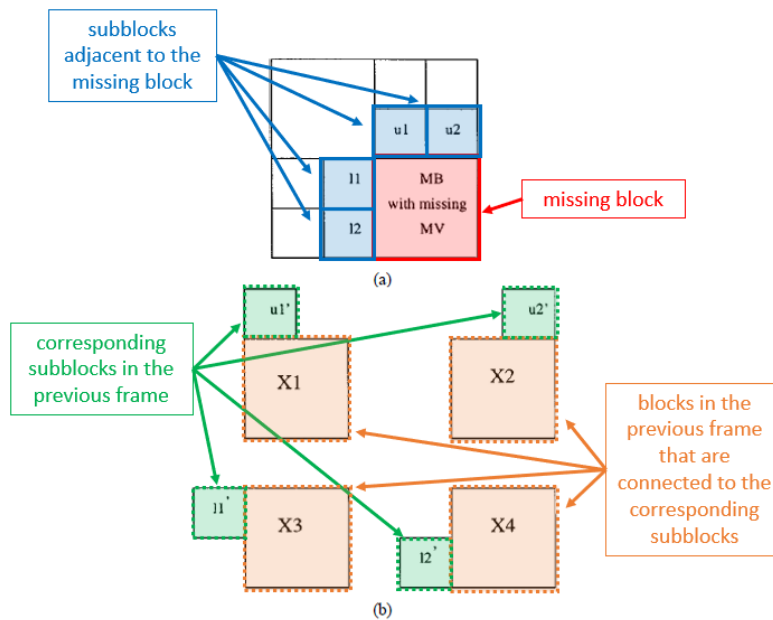


Fig. 1. (a) The four subblocks, (b) their corresponding subblocks in the previous frame, and the blocks connected to them.

SAMSUNG-1006, FIG. 1(a) (annotated and color added); Pet., 35.

Therefore, the Petition demonstrates that Shirani’s 1st-stage estimates the difference in spatial position between (i) pixels near a border of the missing block and (ii) pixels near the best-matched border in the previous frame, by identifying “motion vectors” representing the “displacement” between (i) smaller-sized subblocks adjacent to each border of the missing block and (ii) corresponding smaller-sized subblocks in the previous frame that minimize the “border errors.”

ACT mischaracterizes Shirani by arguing that it “teaches away” from “edge-based methods.” POPR, 3, 33-34 (citing SAMSUNG-1006, 1). The word “edge” in ACT’s cited portion of Shirani refers to edges of *objects* that appear in a visual image, *not* borders of *blocks* that are partitions of a frame. In describing “edge-based methods,” Shirani cites references [5] and [6] (SAMSUNG-1024 and SAMSUNG-1025) which study “edges of objects in the scene” (e.g., “edges of the background vertical column, the hat rim, and Lena’s lip”). SAMSUNG-1024, p. 4 (col. 2, ¶2). These “object edges” are characterized by “what is considered foreground in an image and what is considered background” (e.g., a “lamp post’s single strong edge” or a “tree trunk and flowers on the ground”) SAMSUNG-1025, p. 1 (col. 2 ¶¶2-3); p. 4 (col. 1); p. 5 (col. 1). Furthermore, Shirani describes these “edge-based methods” as examples of 2nd-stage “spatial error concealment” (rather than Shirani’s 1st-stage “temporal error concealment” which is relied upon by the Petition for the claimed “*border motion vector data*”). Therefore, ACT’s “teaching away” arguments are based on mischaracterizations of Shirani and the Petition.

II. MUALLA, SHIRANI, STOCKHAMMER, AND SAITO WERE NEVER PRESENTED TO THE OFFICE

The Office did not consider any of Mualla, Shirani, Stockhammer, or Saito during prosecution. Pet., 7, 106-107; SAMSUNG-1001, Cover. Although Saito’s disclosure cites to Saito-2005, which was cited in an IDS, the Examiner did not consider Saito-2005 in the same way that the Petition presents Saito in

combination with Mualla, Shirani, and Stockhammer (in fact, the claimed “*Poisson’s equation*” was never specifically addressed by the Examiner). As discussed in the Petition, the teachings of Saito would have provided a POSITA with motivations to improve the image-processing techniques of Mualla, Shirani, and Stockhammer. Pet., 42-50. These motivations and the resulting combination could not have been considered by the Office without any of these references.

As noted in the Petition, the Examiner did not rely upon any of Mualla, Shirani, Stockhammer, or Saito to formulate a prior art rejection, and there is no evidence that the Examiner ever substantively considered these references. Pet., 7, 106-107. ACT fails to address how the ***combination*** of references in the Petition is similar to any combination considered during prosecution, and the material error of the Examiner to issue even a single prior art rejection during prosecution makes this an impossible task. POPR, 23-28; Pet., 106-107. Even if one assumes, *arguendo*, that Saito is cumulative to Saito-2005, ACT’s argument fails on its face because no other reference in the Petition’s combination was ever presented to the Office. SAMSUNG-1001, Cover. And because no evaluation or rejection during prosecution involved Mualla, Shirani, Stockhammer, or Saito, none of the *Advanced Bionics* factors (a)-(f) favor discretionary denial. Consequently, a petition should not be denied simply because one reference among a three (or four) reference combination is allegedly cumulative to a reference listed on an IDS.

Proceeding No.: IPR2024-00374

Attorney Docket: 39843-0168IP1

Respectfully submitted,

Dated June 18, 2024

/Won S. Yoon/

W. Karl Renner, Reg. No. 41,265

Jeremy J. Monaldo, Reg. No. 58,680

Won S. Yoon, Reg. No. 71,058

Fish & Richardson P.C.

60 South Sixth Street, Suite 3200

Minneapolis, MN 55402

T: 202-783-5070

F: 877-769-7945

Attorneys for Petitioner

CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4) and 42.205(b), the undersigned certifies that on June 18, 2024, a complete and entire copy of this Petitioner's Reply to Patent Owner's Preliminary Response and Exhibits 1024-1025 were provided by email to the Patent Owner by serving the correspondence address of record as follows:

Peter Lambrianakos
Vincent J. Rubino
Alfred R. Fabricant
Joseph M. Mercadante
FABRICANT LLP
411 Theodore Fremd Avenue, Suite 206
South Rye, New York 10580

Email: ptab@fabricantllp.com

/Diana Bradley/
Diana Bradley
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
Tel: 858-678-5667