

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AVIDBOTS CORP. and AVIDBOTS USA CORP.,

Petitioners,

v.

BRAIN CORPORATION,
Patent Owner.

Case No. IPR2025-01604
U.S. Patent No. 10,728,436

SEARCH DISCLOSURE DECLARATION

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

The Petition for Inter Partes Review cites five references in its grounds:

1. International Publication No. WO 2011/146259 A2 (Ex1004, “Rosenstein”).
2. John Canny, A Computational Approach to Edge Detection, IEEE Transactions on Pattern Analysis and Machine Intelligence (Ex1005, “Canny”)
3. Qian Xu, et. al., A Distributed Canny Edge Detector and its Implementation on FPGA, Proceedings of the IEEE Digital Signal Processing Workshop (January 2011):500-505 (Ex1006, “Xu”).
4. U.S. Patent No. 5,793,900 (Ex1007, “Nourbakhsh”)
5. U.S. Patent No. 9,076,214 (Ex1008, “Tsutsumi”)
6. Collectively, those five references are the asserted prior art.

Per the November 17, 2025 memorandum, Petitioner provides the information for where the asserted prior art was located:

- a. Database and repositories in which the asserted prior art was located: The asserted prior art was located using PatSnap, Google Patents, Espacenet, Google Scholar, and Google Search.
- b. General search approach, search terms, filters, queries or classification pathways employed: One search used Patsnap and searched on the text of the abstract of the '436 patent. Another search used PatSnap, Google Patents, Espacenet Search, Google Scholar, and Google Search and employed

keywords and their semantic variants for searching relevant patents and published applications. Those keywords consisted of the following:

- **Source: PatSnap**

- TAC_ALL:((collision OR object) \$W2 (detection OR avoidance OR identification OR presence)) AND TAC_ALL:("threshold" or "trigger point") AND TAC_ALL:("reference value") AND TACD_ALL:("image pixel" or "pixel?") AND APD:[* TO 20140701]
- TACD_ALL:((collision OR object) \$W2 (detection OR avoidance OR identification OR presence)) AND TACD_ALL:("image pixel" or "pixel?") \$W2 ("deviation" or "diversion" or "angle deviation")) AND TACD_ALL:(reference OR "threshold" OR "predefined value") AND APD:[* TO 20140701]
- (F_CITES:(US9076214B2 or US20130044951A1 or US9122948B1 or JP2012189874A or JP1998206150A or JP2009216600A)) OR (B_CITES:(US9076214B2 or US20130044951A1 or US9122948B1 or JP2012189874A or JP1998206150A or JP2009216600A)) AND APD:[* TO 20140701]
- TACD_ALL:(((Object* OR Obstacle) \$w5 detect*)) AND TACD_ALL:((Contrast \$w5 Calculation)) AND TACD_ALL:((Image OR Pixel) \$w5 (Brightness OR Luminance OR Density OR Intensity)) AND TACD_ALL:(Threshold) AND APD:[* TO 20140701]
- IN:((Filip \$w2 Piekniejszy) OR (Vadim \$w2 Polonichko) OR (Eugene \$w2 Izhikevich)) AND TACD_ALL:("Pixel") AND APD:[* TO 20140701]
- TACD_ALL:((object \$W3 detect*)) AND TACD_ALL:("image pixel" OR "intensity" OR contrast) AND TACD_ALL:((absolute \$W5 Deviation)) AND TACD_ALL:("threshold" or "trigger point" OR reference value) AND APD:[* TO 20140701] AND IPC_CPC:(B60W30/14 OR B60W30/16)

- **Source: Google Patents**

- ("object detection") (image) (contrast) before:filing:20140701
- ("object detection") (image) (contrast) ("absolute deviation") before:filing:20140701
- ("Collision detection" OR "obstacle detection") (image pixel??) ("absolute deviation" OR "deviation") before:filing:20140701
- (Brightness OR Luminance) (Pixel) (Deviation OR Difference) (Robot) before:filing:20140701
- (Contrast NEAR5 Calculation) (Pixel NEAR5 Deviation) (Object NEAR3 Detection) before:filing:20140701
- (Pixel NEAR5 (Intensity OR Density OR Strength OR Brightness)) (Contrast NEAR5 Calculation) (Maximum Deviation) before:filing:20140701
- (Object NEAR5 Detect) (Contrast NEAR5 Comparison) (Threshold Contrast) before:filing:20140701
- (Robot) (Image Capture) (Pixel NEAR5 (Deviation OR Difference)) (Threshold Contrast) before:filing:20140701

- **Source: Espacenet Search**

- ((ftxt all "obstacle" OR ftxt all "object" OR ftxt all "person") AND (ftxt all "detection" OR ftxt all "identification")) AND ftxt=("pixel" prox/distance<5 "deviation") AND (ftxt any "threshold" OR ftxt all "reference point") AND pd <= "2014-07-01"

- **Source: Google Scholar/Google**

- Determining object presence based on contrast calculated from maximum deviation of pixel values
- Object Detection Contrast Comparison with Threshold
- Pixel Deviation Maximum Brightness to Mean Brightness

- Detecting object presence by comparing image contrast value to a dynamically determined threshold
- c. Other analytics or publicly accessible resources consulted: None
- d. The amount of time spent on the search employing PatSnap: 6–8 hours were spent.
- e. The amount of time spent on the search employing PatSnap, Google Patents, Espacenet Search, Google Scholar, and Google Search: 28-38 hours
- f. The amount of time spent reviewing search results from the search employing PatSnap: Two to three hours were spent reviewing the search results.
- g. The amount of time spent reviewing search results from the search employing PatSnap, Google Patents, Espacenet Search, Google Scholar, and Google Search: 30 hours

DATED: December 4, 2025

Respectfully Submitted,

/Brian M. Buroker/

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*Attorney for Petitioners Avidbots Corp. and
Avidbots USA Corp.*

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that a complete copy of Petitioner's Search Disclosure Declaration was served on the Patent Owner via FedEx Priority Overnight at the correspondence address of record for the '436 patent shown in the USPTO Patent Center:

197519 - Pierson Ferdinand, LLP
1101 Pennsylvania Avenue N.W., Suite 300
Washington, DC 20005
United States

A courtesy copy was also sent via electronic mail to Patent Owner's litigation counsel at the following addresses:

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