References

- A. M. Treisman and G. Gelade, "A feature-integration theory of attention," *Cognitive psychology*, 1980, v. 12, n. 1, pp. 97–136.
- S. Frintrop, G. M. García, and A. B. Cremers, "A cognitive approach for object discovery," in 2014 22nd International Conference on Pattern Recognition. IEEE, 2014, pp. 2329–2334.
- [3] L. Itti, G. Rees, and J. K. Tsotsos, *Neurobiology of attention*. Elsevier, 2005.
- [4] M.-M. Cheng, N. J. Mitra, X. Huang, P. H. Torr, and S.-M. Hu, "Global contrast based salient region detection," *IEEE Transactions on Pattern Analysis* and Machine Intelligence, 2015, v. 37, n. 3, pp. 569–582.
- [5] X. Huang and Y.-J. Zhang, "300-fps salient object detection via minimum directional contrast," *IEEE Transactions on Image Processing*, 2017, v. 26, n. 9, pp. 4243–4254.
- [6] K. Oh, M. Lee, G. Kim, and S. Kim, "Detection of multiple salient objects through the integration of estimated foreground clues," *Image and Vision Computing*, 2016, v. 54, pp. 31–44.
- [7] S. S. Kruthiventi, V. Gudisa, J. H. Dholakiya, and R. V. Babu, "Saliency unified: A deep architecture for simultaneous eye fixation prediction and salient object segmentation," in *Proceedings of the IEEE conference on computer vi*sion and pattern recognition, 2016, pp. 5781–5790.

- [8] L. Itti and P. Baldi, "Bayesian surprise attracts human attention," Vision research, 2009, v. 49, n. 10, pp. 1295–1306.
- [9] J. M. Wolfe, K. R. Cave, and S. L. Franzel, "Guided search: an alternative to the feature integration model for visual search." *Journal of Experimental Psychology: Human perception and performance*, 1989, v. 15, n. 3, p. 419.
- [10] L. Itti, C. Koch, and E. Niebur, "A model of saliency-based visual attention for rapid scene analysis," *IEEE Transactions on pattern analysis and machine intelligence*, 1998, v. 20, n. 11, pp. 1254–1259.
- [11] R. Achanta, S. Hemami, F. Estrada, and S. Susstrunk, "Frequency-tuned salient region detection," in *Computer vision and pattern recognition*, 2009. *cvpr 2009. ieee conference on*. IEEE, 2009, pp. 1597–1604.
- [12] W. Zhu, S. Liang, Y. Wei, and J. Sun, "Saliency optimization from robust background detection," in *Proceedings of the IEEE conference on computer* vision and pattern recognition, 2014, pp. 2814–2821.
- [13] J. Shi, Q. Yan, L. Xu, and J. Jia, "Hierarchical image saliency detection on extended cssd," *IEEE transactions on pattern analysis and machine intelligence*, 2016, v. 38, n. 4, pp. 717–729.
- [14] Y. Qin, H. Lu, Y. Xu, and H. Wang, "Saliency detection via cellular automata," in *Computer Vision and Pattern Recognition (CVPR)*, 2015 IEEE Conference on. IEEE, 2015, pp. 110–119.
- [15] F. Guo, W. Wang, J. Shen, L. Shao, J. Yang, D. Tao, and Y. Y. Tang, "Video saliency detection using object proposals," *IEEE transactions on cybernetics*, 2017, v. 48, n. 11, pp. 3159–3170.
- [16] S. He, R. W. Lau, W. Liu, Z. Huang, and Q. Yang, "Supercnn: A superpixelwise convolutional neural network for salient object detection," *International journal of computer vision*, 2015, v. 115, n. 3, pp. 330–344.

- [17] L. Wang, L. Wang, H. Lu, P. Zhang, and X. Ruan, "Saliency detection with recurrent fully convolutional networks," in *European conference on computer* vision. Springer, 2016, pp. 825–841.
- [18] T. Durand, T. Mordan, N. Thome, and M. Cord, "Wildcat: Weakly supervised learning of deep convnets for image classification, pointwise localization and segmentation," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2017)*, 2017.
- [19] A. Borji, D. N. Sihite, and L. Itti, "Quantitative analysis of human-model agreement in visual saliency modeling: A comparative study," *IEEE Transactions on Image Processing*, 2013, v. 22, n. 1, pp. 55–69.
- [20] B. Mahasseni, M. Lam, and S. Todorovic, "Unsupervised video summarization with adversarial lstm networks," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.
- [21] Y. Wei, J. Feng, X. Liang, M.-M. Cheng, Y. Zhao, and S. Yan, "Object region mining with adversarial erasing: A simple classification to semantic segmentation approach," in *Proceedings of the IEEE conference on computer vision* and pattern recognition, 2017, pp. 1568–1576.
- [22] D.-P. Fan, G.-P. Ji, G. Sun, M.-M. Cheng, J. Shen, and L. Shao, "Camouflaged object detection," in *Proceedings of the IEEE/CVF conference on computer* vision and pattern recognition, 2020, pp. 2777–2787.
- [23] E. Ahn, J. Kim, L. Bi, A. Kumar, C. Li, M. Fulham, and D. D. Feng, "Saliencybased lesion segmentation via background detection in dermoscopic images," *IEEE journal of biomedical and health informatics*, 2017, v. 21, n. 6, pp. 1685– 1693.
- [24] A. Karpathy, S. Miller, and L. Fei-Fei, "Object discovery in 3d scenes via shape analysis," in 2013 IEEE International Conference on Robotics and Automation. IEEE, 2013, pp. 2088–2095.

- [25] A. Borji and L. Itti, "Defending yarbus: Eye movements reveal observers" task," *Journal of vision*, 2014, v. 14, n. 3, pp. 29–29.
- [26] P. L. Rosin and Y.-K. Lai, "Artistic minimal rendering with lines and blocks," *Graphical Models*, 2013, v. 75, n. 4, pp. 208–229.
- [27] S. Avidan and A. Shamir, "Seam carving for content-aware image resizing," in ACM SIGGRAPH 2007 papers, 2007, pp. 10–es.
- [28] W. Wang, J. Shen, and H. Ling, "A deep network solution for attention and aesthetics aware photo cropping," *IEEE transactions on pattern analysis and machine intelligence*, 2018, v. 41, n. 7, pp. 1531–1544.
- [29] S. Chikkerur, T. Serre, C. Tan, and T. Poggio, "What and where: A bayesian inference theory of attention," *Vision research*, 2010, v. 50, n. 22, pp. 2233– 2247.
- [30] Y. Yu, J. Choi, Y. Kim, K. Yoo, S.-H. Lee, and G. Kim, "Supervising neural attention models for video captioning by human gaze data," in *IEEE Confer*ence on Computer Vision and Pattern Recognition (CVPR 2017). Honolulu, Hawaii, 2017, pp. 2680–8.
- [31] T. Judd, F. Durand, and A. Torralba, "A benchmark of computational models of saliency to predict human fixations," 2012.
- [32] Y.-F. Ma and H.-J. Zhang, "Contrast-based image attention analysis by using fuzzy growing," in *Proceedings of the eleventh ACM international conference* on Multimedia. ACM, 2003, pp. 374–381.
- [33] D. Comaniciu and P. Meer, "Mean shift: A robust approach toward feature space analysis," *IEEE Transactions on pattern analysis and machine intelli*gence, 2002, v. 24, n. 5, pp. 603–619.

- [34] C. Rother, V. Kolmogorov, and A. Blake, "Grabcut: Interactive foreground extraction using iterated graph cuts," in ACM transactions on graphics (TOG), v. 23, n. 3. ACM, 2004, pp. 309–314.
- [35] M.-M. Cheng, N. J. Mitra, X. Huang, P. H. Torr, and S.-M. Hu, "Salient object detection and segmentation," *IEEE Transactions on Pattern Analysis* & Machine Intelligence, 2014, n. 1, pp. 1–1.
- [36] J. Zhang and S. Sclaroff, "Exploiting surroundedness for saliency detection: a boolean map approach," *IEEE transactions on pattern analysis and machine intelligence*, 2016, v. 38, n. 5, pp. 889–902.
- [37] M. Donoser, M. Urschler, M. Hirzer, and H. Bischof, "Saliency driven total variation segmentation," in *Computer Vision*, 2009 IEEE 12th International Conference on. IEEE, 2009, pp. 817–824.
- [38] C. Zhu, G. Li, W. Wang, and R. Wang, "An innovative salient object detection using center-dark channel prior [c]," in *IEEE International Conference on Computer Vision Workshop (ICCVW)*, 2017.
- [39] J. Zhang, K. A. Ehinger, H. Wei, K. Zhang, and J. Yang, "A novel graphbased optimization framework for salient object detection," *Pattern Recognition*, 2017, v. 64, pp. 39–50.
- [40] W. Kienzle, M. O. Franz, B. Schölkopf, and F. A. Wichmann, "Centersurround patterns emerge as optimal predictors for human saccade targets," *Journal of vision*, 2009, v. 9, n. 5, pp. 7–7.
- [41] K. Huang, C. Zhu, and G. Li, "Robust saliency detection via fusing foreground and background priors," arXiv preprint arXiv:1711.00322, 2017.
- [42] W.-C. Tu, S. He, Q. Yang, and S.-Y. Chien, "Real-time salient object detection with a minimum spanning tree," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2016, pp. 2334–2342.

- [43] Y. Cheng, H. Fu, X. Wei, J. Xiao, and X. Cao, "Depth enhanced saliency detection method," in *Proceedings of international conference on internet multimedia computing and service*. ACM, 2014, p. 23.
- [44] B. Alexe, T. Deselaers, and V. Ferrari, "Measuring the objectness of image windows," *IEEE transactions on pattern analysis and machine intelligence*, 2012, v. 34, n. 11, pp. 2189–2202.
- [45] M. Li, Y. Yang, L. Xu, C. Xu, and X. Sun, "Salient object detection based on unified convex surrogate for non-convex schatten-p norm," *IEEE Access*, 2020, v. 8, pp. 20171–20180.
- [46] X. Wu, X. Ma, J. Zhang, and Z. Jin, "Salient object detection via reliable boundary seeds and saliency refinement," *IET Computer Vision*, 2019, v. 13, n. 3, pp. 302–311.
- [47] Z. Liu, Q. Li, and W. Li, "Deep layer guided network for salient object detection," *Neurocomputing*, 2020, v. 372, pp. 55–63.
- [48] J. Qi, S. Dong, F. Huang, and H. Lu, "Saliency detection via joint modeling global shape and local consistency," *Neurocomputing*, 2017, v. 222, pp. 81–90.
- [49] Z. Chen, R. Cong, Q. Xu, and Q. Huang, "Dpanet: Depth potentiality-aware gated attention network for rgb-d salient object detection," *IEEE Transactions* on Image Processing, 2021.
- [50] M. Li, Y. Zhang, M. Xiao, W. Zhang, and X. Sun, "Unsupervised learning for salient object detection via minimization of bilinear factor matrix norm," *IEEE Transactions on Neural Networks and Learning Systems*, 2021.
- [51] Y. Zhou, A. Mao, S. Huo, J. Lei, and S.-Y. Kung, "Salient object detection via fuzzy theory and object-level enhancement," *IEEE Transactions on Multimedia*, 2018, v. 21, n. 1, pp. 74–85.

- [52] J. Ren, Z. Liu, X. Zhou, G. Sun, and C. Bai, "Saliency integration driven by similar images," *Journal of Visual Communication and Image Representation*, 2018, v. 50, pp. 227–236.
- [53] G. Gao, C. Han, K. Ma, C. H. Liu, G. Ding, and E. Liu, "Optimal feature combination analysis for crowd saliency prediction," *Journal of Visual Communication and Image Representation*, 2018, v. 50, pp. 1–8.
- [54] W. Zou, K. Kpalma, Z. Liu, and J. Ronsin, "Segmentation driven low-rank matrix recovery for saliency detection," in 24th British machine vision conference (BMVC), 2013, pp. 1–13.
- [55] X. Shen and Y. Wu, "A unified approach to salient object detection via low rank matrix recovery," in 2012 IEEE Conference on Computer Vision and Pattern Recognition. IEEE, 2012, pp. 853–860.
- [56] H. Peng, B. Li, H. Ling, W. Hu, W. Xiong, and S. J. Maybank, "Salient object detection via structured matrix decomposition," *IEEE transactions on pattern* analysis and machine intelligence, 2016, v. 39, n. 4, pp. 818–832.
- [57] C. Tang, P. Wang, C. Zhang, and W. Li, "Salient object detection via weighted low rank matrix recovery," *IEEE Signal Processing Letters*, 2016, v. 24, n. 4, pp. 490–494.
- [58] D. Gao, V. Mahadevan, and N. Vasconcelos, "On the plausibility of the discriminant center-surround hypothesis for visual saliency," *Journal of vision*, 2008, v. 8, n. 7, pp. 13–13.
- [59] D. A. Klein and S. Frintrop, "Center-surround divergence of feature statistics for salient object detection," in 2011 International Conference on Computer Vision. IEEE, 2011, pp. 2214–2219.
- [60] X. Hou and L. Zhang, "Saliency detection: A spectral residual approach," in Computer Vision and Pattern Recognition, 2007. CVPR'07. IEEE Conference on. IEEE, 2007, pp. 1–8.

- [61] R. M. Haralick, L. T. Watson, and T. J. Laffey, "The topographic primal sketch," *The International Journal of Robotics Research*, 1983, v. 2, n. 1, pp. 50–72.
- [62] F. Perazzi, P. Krähenbühl, Y. Pritch, and A. Hornung, "Saliency filters: Contrast based filtering for salient region detection," in *Computer Vision and Pattern Recognition (CVPR), 2012 IEEE Conference on.* IEEE, 2012, pp. 733–740.
- [63] L. Wang, H. Lu, Y. Wang, M. Feng, D. Wang, B. Yin, and X. Ruan, "Learning to detect salient objects with image-level supervision," in *Proc. IEEE Conf. Comput. Vis. Pattern Recognit.(CVPR)*, 2017, pp. 136–145.
- [64] J.-X. Zhao, Y. Cao, D.-P. Fan, M.-M. Cheng, X.-Y. Li, and L. Zhang, "Contrast prior and fluid pyramid integration for rgbd salient object detection," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2019, pp. 3927–3936.
- [65] R. Achanta, F. Estrada, P. Wils, and S. Süsstrunk, "Salient region detection and segmentation," in *International conference on computer vision systems*. Springer, 2008, pp. 66–75.
- [66] R. Achanta and S. Süsstrunk, "Saliency detection using maximum symmetric surround," in *Image processing (ICIP)*, 2010 17th IEEE international conference on. IEEE, 2010, pp. 2653–2656.
- [67] F. Liu and M. Gleicher, "Region enhanced scale-invariant saliency detection," in *Multimedia and Expo*, 2006 IEEE International Conference on. IEEE, 2006, pp. 1477–1480.
- [68] M.-M. Cheng, J. Warrell, W.-Y. Lin, S. Zheng, V. Vineet, and N. Crook, "Efficient salient region detection with soft image abstraction," in *Computer Vision (ICCV), 2013 IEEE International Conference on.* IEEE, 2013, pp. 1529–1536.

- [69] W.-P. Ma, W.-X. Li, J.-C. Sun, and P.-X. Cao, "Saliency detection via manifold ranking based on robust foreground," *International Journal of Automation* and Computing, 2021, v. 18, n. 1, pp. 73–84.
- [70] K. Huang, C. Zhu, and G. Li, "Robust salient object detection via fusing foreground and background priors," in 2018 25th IEEE International Conference on Image Processing (ICIP). IEEE, 2018, pp. 2341–2345.
- [71] C. Zhu, G. Li, W. Wang, and R. Wang, "Salient object detection with complex scene based on cognitive neuroscience," in 2017 IEEE Third International Conference on Multimedia Big Data (BigMM). IEEE, 2017, pp. 33–37.
- [72] Q. Liu, X. Hong, B. Zou, J. Chen, Z. Chen, and G. Zhao, "Hierarchical contour closure-based holistic salient object detection," *IEEE Transactions on Image Processing*, 2017, v. 26, n. 9, pp. 4537–4552.
- [73] X. Zhang, X. Sun, and X. Zhang, "Salient object detection via nonconvex structured matrix decomposition," in 2017 13th International Conference on Computational Intelligence and Security (CIS). IEEE, 2017, pp. 120–124.
- [74] X. Xiao and Y. Zhou, "Focusness guided salient object detection," in 2017 IEEE International Conference on Systems, Man, and Cybernetics (SMC).
 IEEE, 2017, pp. 3462–3466.
- [75] C. Yang, L. Zhang, H. Lu, X. Ruan, and M.-H. Yang, "Saliency detection via graph-based manifold ranking," in *Computer Vision and Pattern Recognition* (CVPR), 2013 IEEE Conference on. IEEE, 2013, pp. 3166–3173.
- [76] Y. Wei, F. Wen, W. Zhu, and J. Sun, "Geodesic saliency using background priors," in *European conference on computer vision*. Springer, 2012, pp. 29– 42.
- [77] R. Strand, K. C. Ciesielski, F. Malmberg, and P. K. Saha, "The minimum barrier distance," *Computer Vision and Image Understanding*, 2013, v. 117, n. 4, pp. 429–437.

- [78] Q. Wang, W. Zheng, and R. Piramuthu, "Grab: Visual saliency via novel graph model and background priors," in *Proceedings of the IEEE conference* on computer vision and pattern recognition, 2016, pp. 535–543.
- [79] J. Han, D. Zhang, X. Hu, L. Guo, J. Ren, and F. Wu, "Background prior-based salient object detection via deep reconstruction residual," *IEEE Transactions* on Circuits and Systems for Video Technology, 2014, v. 25, n. 8, pp. 1309–1321.
- [80] J. Zhang and S. Sclaroff, "Saliency detection: A boolean map approach," in Proceedings of the IEEE international conference on computer vision, 2013, pp. 153–160.
- [81] P. Jiang, H. Ling, J. Yu, and J. Peng, "Salient region detection by ufo: Uniqueness, focusness and objectness," in *Proceedings of the IEEE international conference on computer vision*, 2013, pp. 1976–1983.
- [82] B. Alexe, T. Deselaers, and V. Ferrari, "What is an object?" in 2010 IEEE computer society conference on computer vision and pattern recognition. IEEE, 2010, pp. 73–80.
- [83] Y. Lu, W. Zhang, H. Lu, and X. Xue, "Salient object detection using concavity context," in 2011 International Conference on Computer Vision. IEEE, 2011, pp. 233–240.
- [84] K.-Y. Chang, T.-L. Liu, H.-T. Chen, and S.-H. Lai, "Fusing generic objectness and visual saliency for salient object detection," in 2011 International Conference on Computer Vision. IEEE, 2011, pp. 914–921.
- [85] A. Borji, M.-M. Cheng, Q. Hou, H. Jiang, and J. Li, "Salient object detection: A survey," arXiv preprint arXiv:1411.5878, 2014.
- [86] X. Sun, X. Zhang, W. Zou, and C. Xu, "Focus prior estimation for salient object detection," in 2017 IEEE International Conference on Image Processing (ICIP). IEEE, 2017, pp. 1532–1536.

- [87] X. Wang and Z. Liu, "Salient object detection by optimizing robust background detection," in 2018 IEEE 18th International Conference on Communication Technology (ICCT). IEEE, 2018, pp. 1164–1168.
- [88] Q. Zhang, D. Luo, W. Li, Y. Shi, and J. Lin, "Two-stage absorbing markov chain for salient object detection," in 2017 IEEE International Conference on Image Processing (ICIP). IEEE, 2017, pp. 895–899.
- [89] M. R. Abkenar, H. Sadreazami, and M. O. Ahmad, "Graph-based salient object detection using background and foreground connectivity cues," in 2019 *IEEE International Symposium on Circuits and Systems (ISCAS)*. IEEE, 2019, pp. 1–5.
- [90] F. Nouri, K. Kazemi, and H. Danyali, "Salient object detection via global contrast graph," in 2015 Signal Processing and Intelligent Systems Conference (SPIS). IEEE, 2015, pp. 159–163.
- [91] X. Li, Y. Li, C. Shen, A. Dick, and A. Van Den Hengel, "Contextual hypergraph modeling for salient object detection," in *Computer Vision (ICCV)*, 2013 IEEE International Conference on. IEEE, 2013, pp. 3328–3335.
- [92] H.-B. Wang and H. Lv, "Salient object detection with fixation priori," in 2016 international conference on machine learning and cybernetics (ICMLC), v. 1. IEEE, 2016, pp. 285–289.
- [93] I. Filali, M. S. Allili, and N. Benblidia, "Multi-scale salient object detection using graph ranking and global-local saliency refinement," *Signal Processing: Image Communication*, 2016, v. 47, pp. 380–401.
- [94] S. Du and S. Chen, "Salient object detection via random forest," *IEEE Signal Processing Letters*, 2013, v. 21, n. 1, pp. 51–54.
- [95] J. Zhang, K. A. Ehinger, J. Ding, and J. Yang, "A prior-based graph for salient object detection," in 2014 IEEE international conference on image processing (ICIP). IEEE, 2014, pp. 1175–1178.

- [96] X. Wang, H. Ma, and X. Chen, "Geodesic weighted bayesian model for salient object detection," in 2015 IEEE International Conference on Image Processing (ICIP). IEEE, 2015, pp. 397–401.
- [97] Y. Niu, Y. Geng, X. Li, and F. Liu, "Leveraging stereopsis for saliency analysis," in 2012 IEEE Conference on Computer Vision and Pattern Recognition. IEEE, 2012, pp. 454–461.
- [98] H. Peng, B. Li, W. Xiong, W. Hu, and R. Ji, "Rgbd salient object detection: a benchmark and algorithms," in *European conference on computer vision*. Springer, 2014, pp. 92–109.
- [99] Y. Fang, J. Wang, M. Narwaria, P. Le Callet, and W. Lin, "Saliency detection for stereoscopic images," *IEEE Transactions on Image Processing*, 2014, v. 23, n. 6, pp. 2625–2636.
- [100] N. Li, J. Ye, Y. Ji, H. Ling, and J. Yu, "Saliency detection on light field," in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2014, pp. 2806–2813.
- [101] J. Ren, X. Gong, L. Yu, W. Zhou, and M. Ying Yang, "Exploiting global priors for rgb-d saliency detection," in *Proceedings of the IEEE conference on* computer vision and pattern recognition workshops, 2015, pp. 25–32.
- [102] D. Feng, N. Barnes, S. You, and C. McCarthy, "Local background enclosure for rgb-d salient object detection," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2016, pp. 2343–2350.
- [103] J. Guo, T. Ren, and J. Bei, "Salient object detection for rgb-d image via saliency evolution," in 2016 IEEE International Conference on Multimedia and Expo (ICME). IEEE, 2016, pp. 1–6.
- [104] A. Wang and M. Wang, "Rgb-d salient object detection via minimum barrier distance transform and saliency fusion," *IEEE Signal Processing Letters*, 2017, v. 24, n. 5, pp. 663–667.

- [105] H. Song, Z. Liu, H. Du, G. Sun, O. Le Meur, and T. Ren, "Depth-aware salient object detection and segmentation via multiscale discriminative saliency fusion and bootstrap learning," *IEEE Transactions on Image Processing*, 2017, v. 26, n. 9, pp. 4204–4216.
- [106] R. Cong, J. Lei, H. Fu, J. Hou, Q. Huang, and S. Kwong, "Going from rgb to rgbd saliency: A depth-guided transformation model," *IEEE transactions on* cybernetics, 2019, v. 50, n. 8, pp. 3627–3639.
- [107] F. Liang, L. Duan, W. Ma, Y. Qiao, Z. Cai, and L. Qing, "Stereoscopic saliency model using contrast and depth-guided-background prior," *Neurocomputing*, 2018, v. 275, pp. 2227–2238.
- [108] C. Zhu, G. Li, X. Guo, W. Wang, and R. Wang, "A multilayer backpropagation saliency detection algorithm based on depth mining," in *International Conference on Computer Analysis of Images and Patterns*. Springer, 2017, pp. 14–23.
- [109] R. Cong, J. Lei, C. Zhang, Q. Huang, X. Cao, and C. Hou, "Saliency detection for stereoscopic images based on depth confidence analysis and multiple cues fusion," *IEEE Signal Processing Letters*, 2016, v. 23, n. 6, pp. 819–823.
- [110] R. Ju, L. Ge, W. Geng, T. Ren, and G. Wu, "Depth saliency based on anisotropic center-surround difference," in 2014 IEEE international conference on image processing (ICIP). IEEE, 2014, pp. 1115–1119.
- [111] A. Krizhevsky, I. Sutskever, and G. E. Hinton, "Imagenet classification with deep convolutional neural networks," Advances in neural information processing systems, 2012, v. 25.
- [112] O. Russakovsky, J. Deng, H. Su, J. Krause, S. Satheesh, S. Ma, Z. Huang, A. Karpathy, A. Khosla, M. Bernstein *et al.*, "Imagenet large scale visual recognition challenge," *International journal of computer vision*, 2015, v. 115, n. 3, pp. 211–252.

- [113] R. Girshick, J. Donahue, T. Darrell, and J. Malik, "Rich feature hierarchies for accurate object detection and semantic segmentation," in *Proceedings of* the IEEE conference on computer vision and pattern recognition, 2014, pp. 580–587.
- [114] P. Sermanet, D. Eigen, X. Zhang, M. Mathieu, R. Fergus, and Y. LeCun, "Overfeat: Integrated recognition, localization and detection using convolutional networks," arXiv preprint arXiv:1312.6229, 2013.
- [115] G. Li and Y. Yu, "Visual saliency based on multiscale deep features," in Proceedings of the IEEE conference on computer vision and pattern recognition, 2015, pp. 5455–5463.
- [116] H. Chen and Y. Li, "Progressively complementarity-aware fusion network for rgb-d salient object detection," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2018, pp. 3051–3060.
- [117] M. Rastegari, V. Ordonez, J. Redmon, and A. Farhadi, "Xnor-net: Imagenet classification using binary convolutional neural networks," in *European conference on computer vision*. Springer, 2016, pp. 525–542.
- [118] Z. Wu, C. Shen, and A. Van Den Hengel, "Wider or deeper: Revisiting the resnet model for visual recognition," *Pattern Recognition*, 2019, v. 90, pp. 119–133.
- [119] C. Szegedy, V. Vanhoucke, S. Ioffe, J. Shlens, and Z. Wojna, "Rethinking the inception architecture for computer vision," in *Proceedings of the IEEE* conference on computer vision and pattern recognition, 2016, pp. 2818–2826.
- [120] K. Simonyan and A. Zisserman, "Very deep convolutional networks for largescale image recognition," arXiv preprint arXiv:1409.1556, 2014.
- [121] P. Isola, J.-Y. Zhu, T. Zhou, and A. A. Efros, "Image-to-image translation with conditional adversarial networks," in *Proceedings of the IEEE conference* on computer vision and pattern recognition, 2017, pp. 1125–1134.

- [122] G. Lee, Y.-W. Tai, and J. Kim, "Deep saliency with encoded low level distance map and high level features," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2016, pp. 660–668.
- [123] J. Long, E. Shelhamer, and T. Darrell, "Fully convolutional networks for semantic segmentation," in *Proceedings of the IEEE conference on computer* vision and pattern recognition, 2015, pp. 3431–3440.
- [124] Q. Hou, M.-M. Cheng, X. Hu, A. Borji, Z. Tu, and P. H. Torr, "Deeply supervised salient object detection with short connections," in *Proceedings of* the IEEE Conference on Computer Vision and Pattern Recognition, 2017, pp. 3203–3212.
- [125] L. Qu, S. He, J. Zhang, J. Tian, Y. Tang, and Q. Yang, "Rgbd salient object detection via deep fusion," *IEEE Transactions on Image Processing*, 2017, v. 26, n. 5, pp. 2274–2285.
- [126] J. Han, H. Chen, N. Liu, C. Yan, and X. Li, "Cnns-based rgb-d saliency detection via cross-view transfer and multiview fusion," *IEEE transactions on cybernetics*, 2017, v. 48, n. 11, pp. 3171–3183.
- [127] X. Zhao, L. Zhang, Y. Pang, H. Lu, and L. Zhang, "A single stream network for robust and real-time rgb-d salient object detection," in *European Conference* on Computer Vision. Springer, 2020, pp. 646–662.
- [128] R. Shigematsu, D. Feng, S. You, and N. Barnes, "Learning rgb-d salient object detection using background enclosure, depth contrast, and top-down features," in *Proceedings of the IEEE International Conference on Computer Vi*sion Workshops, 2017, pp. 2749–2757.
- [129] S. Chen and Y. Fu, "Progressively guided alternate refinement network for rgb-d salient object detection," in *European Conference on Computer Vision*. Springer, 2020, pp. 520–538.

- [130] D.-P. Fan, Z. Lin, Z. Zhang, M. Zhu, and M.-M. Cheng, "Rethinking rgbd salient object detection: Models, data sets, and large-scale benchmarks," *IEEE Transactions on Neural Networks and Learning Systems*, 2020.
- [131] K. Fu, D.-P. Fan, G.-P. Ji, and Q. Zhao, "Jl-dcf: Joint learning and denselycooperative fusion framework for rgb-d salient object detection," in *Proceedings* of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2020, pp. 3052–3062.
- [132] Y. Pang, L. Zhang, X. Zhao, and H. Lu, "Hierarchical dynamic filtering network for rgb-d salient object detection," in *European Conference on Computer Vision*. Springer, 2020, pp. 235–252.
- [133] N. Wang and X. Gong, "Adaptive fusion for rgb-d salient object detection," *IEEE Access*, 2019, v. 7, pp. 55 277–55 284.
- [134] C. Li, R. Cong, Y. Piao, Q. Xu, and C. C. Loy, "Rgb-d salient object detection with cross-modality modulation and selection," in *European Conference on Computer Vision*. Springer, 2020, pp. 225–241.
- [135] D.-P. Fan, Y. Zhai, A. Borji, J. Yang, and L. Shao, "Bbs-net: Rgb-d salient object detection with a bifurcated backbone strategy network," in *European Conference on Computer Vision*. Springer, 2020, pp. 275–292.
- [136] J. Zhang, D.-P. Fan, Y. Dai, S. Anwar, F. S. Saleh, T. Zhang, and N. Barnes, "Uc-net: Uncertainty inspired rgb-d saliency detection via conditional variational autoencoders," in *Proceedings of the IEEE/CVF conference on computer* vision and pattern recognition, 2020, pp. 8582–8591.
- [137] N. Liu, N. Zhang, and J. Han, "Learning selective self-mutual attention for rgb-d saliency detection," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2020, pp. 13756–13765.

- [138] B. Jiang, Z. Zhou, X. Wang, J. Tang, and B. Luo, "cmsalgan: Rgb-d salient object detection with cross-view generative adversarial networks," *IEEE Transactions on Multimedia*, 2020, v. 23, pp. 1343–1353.
- [139] M. Zhang, W. Ren, Y. Piao, Z. Rong, and H. Lu, "Select, supplement and focus for rgb-d saliency detection," in *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition*, 2020, pp. 3472–3481.
- [140] M. Zhang, S. X. Fei, J. Liu, S. Xu, Y. Piao, and H. Lu, "Asymmetric twostream architecture for accurate rgb-d saliency detection," in *European Conference on Computer Vision*. Springer, 2020, pp. 374–390.
- [141] Y. Piao, Z. Rong, M. Zhang, W. Ren, and H. Lu, "A2dele: Adaptive and attentive depth distiller for efficient rgb-d salient object detection," in *Proceedings* of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2020, pp. 9060–9069.
- [142] A. Luo, X. Li, F. Yang, Z. Jiao, H. Cheng, and S. Lyu, "Cascade graph neural networks for rgb-d salient object detection," in *European Conference* on Computer Vision. Springer, 2020, pp. 346–364.
- [143] S. Chen, X. Tan, B. Wang, and X. Hu, "Reverse attention for salient object detection," in *Proceedings of the European conference on computer vision* (ECCV), 2018, pp. 234–250.
- [144] Y. Piao, W. Ji, J. Li, M. Zhang, and H. Lu, "Depth-induced multi-scale recurrent attention network for saliency detection," in *Proceedings of the IEEE/CVF International Conference on Computer Vision*, 2019, pp. 7254– 7263.
- [145] T. Xiao, Y. Xu, K. Yang, J. Zhang, Y. Peng, and Z. Zhang, "The application of two-level attention models in deep convolutional neural network for fine-grained image classification," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2015, pp. 842–850.

- [146] P. Lu, L. Ji, W. Zhang, N. Duan, M. Zhou, and J. Wang, "R-vqa: learning visual relation facts with semantic attention for visual question answering," in Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, 2018, pp. 1880–1889.
- [147] D. Bahdanau, K. Cho, and Y. Bengio, "Neural machine translation by jointly learning to align and translate," arXiv preprint arXiv:1409.0473, 2014.
- [148] Q. You, H. Jin, Z. Wang, C. Fang, and J. Luo, "Image captioning with semantic attention," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2016, pp. 4651–4659.
- [149] J. Li, M.-T. Luong, and D. Jurafsky, "A hierarchical neural autoencoder for paragraphs and documents," arXiv preprint arXiv:1506.01057, 2015.
- [150] Y. Wan, Z. Zhao, M. Yang, G. Xu, H. Ying, J. Wu, and P. S. Yu, "Improving automatic source code summarization via deep reinforcement learning," in *Proceedings of the 33rd ACM/IEEE International Conference on Automated Software Engineering*, 2018, pp. 397–407.
- [151] R. Paulus, C. Xiong, and R. Socher, "A deep reinforced model for abstractive summarization," arXiv preprint arXiv:1705.04304, 2017.
- [152] K. Xu, J. Ba, R. Kiros, K. Cho, A. Courville, R. Salakhudinov, R. Zemel, and Y. Bengio, "Show, attend and tell: Neural image caption generation with visual attention," in *International conference on machine learning*. PMLR, 2015, pp. 2048–2057.
- [153] J. Hu, L. Shen, and G. Sun, "Squeeze-and-excitation networks," in Proceedings of the IEEE conference on computer vision and pattern recognition, 2018, pp. 7132–7141.
- [154] T. Liu, Z. Yuan, J. Sun, J. Wang, N. Zheng, X. Tang, and H.-Y. Shum, "Learning to detect a salient object," *IEEE Transactions on Pattern analysis* and machine intelligence, 2010, v. 33, n. 2, pp. 353–367.

- [155] Y. Li, X. Hou, C. Koch, J. M. Rehg, and A. L. Yuille, "The secrets of salient object segmentation." Georgia Institute of Technology, 2014.
- [156] J. Li, M. D. Levine, X. An, X. Xu, and H. He, "Visual saliency based on scale-space analysis in the frequency domain," *IEEE transactions on pattern* analysis and machine intelligence, 2013, v. 35, n. 4, pp. 996–1010.
- [157] Q. Yan, J. Shi, L. Xu, and J. Jia, "Hierarchical saliency detection on extended cssd," arXiv preprint arXiv:1408.5418, 2014.
- [158] A. Borji, M.-M. Cheng, H. Jiang, and J. Li, "Salient object detection: A benchmark," *IEEE Transactions on Image Processing*, 2015, v. 24, n. 12, pp. 5706–5722.
- [159] P. Arbelaez, M. Maire, C. Fowlkes, and J. Malik, "Contour detection and hierarchical image segmentation," *IEEE transactions on pattern analysis and machine intelligence*, 2010, v. 33, n. 5, pp. 898–916.
- [160] M. Brown and S. Süsstrunk, "Multi-spectral sift for scene category recognition," in CVPR 2011. IEEE, 2011, pp. 177–184.
- [161] A. Borji, D. N. Sihite, and L. Itti, "What stands out in a scene? a study of human explicit saliency judgment," *Vision research*, 2013, v. 91, pp. 62–77.
- [162] A. Ciptadi, T. Hermans, and J. M. Rehg, "An in depth view of saliency." Georgia Institute of Technology, 2013.
- [163] C. Zhu and G. Li, "A three-pathway psychobiological framework of salient object detection using stereoscopic technology," in *Proceedings of the IEEE International Conference on Computer Vision Workshops*, 2017, pp. 3008– 3014.
- [164] D.-P. Fan, M.-M. Cheng, Y. Liu, T. Li, and A. Borji, "Structure-measure: A new way to evaluate foreground maps," in *Proceedings of the IEEE international conference on computer vision*, 2017, pp. 4548–4557.

- [165] D.-P. Fan, C. Gong, Y. Cao, B. Ren, M.-M. Cheng, and A. Borji, "Enhancedalignment measure for binary foreground map evaluation," arXiv preprint arXiv:1805.10421, 2018.
- [166] A. Borji and L. Itti, "Exploiting local and global patch rarities for saliency detection," in *Computer Vision and Pattern Recognition (CVPR)*, 2012 IEEE Conference on. IEEE, 2012, pp. 478–485.
- [167] G. Wang, Y. Zhang, and J. Li, "High-level background prior based salient object detection," Journal of Visual Communication and Image Representation, 2017, v. 48, pp. 432–441.
- [168] J. Yang and M.-H. Yang, "Top-down visual saliency via joint crf and dictionary learning," in Computer Vision and Pattern Recognition (CVPR), 2012 IEEE Conference on. IEEE, 2012, pp. 2296–2303.
- [169] Z. Liu, S. Shi, Q. Duan, W. Zhang, and P. Zhao, "Salient object detection for rgb-d image by single stream recurrent convolution neural network," *Neurocomputing*, 2019, v. 363, pp. 46–57.
- [170] T. Liu, Z. Yuan, J. Sun, J. Wang, N. Zheng, X. Tang, and H.-Y. Shum, "Learning to detect a salient object," *IEEE Transactions on Pattern analysis* and machine intelligence, 2011, v. 33, n. 2, pp. 353–367.
- [171] P. Pérez, M. Gangnet, and A. Blake, "Poisson image editing," ACM Transactions on graphics (TOG), 2003, v. 22, n. 3, pp. 313–318.
- [172] P. Harremoës, "Binomial and poisson distributions as maximum entropy distributions," *IEEE Transactions on Information Theory*, 2001, v. 47, n. 5, pp. 2039–2041.
- [173] Z. Kourtzi and N. Kanwisher, "Representation of perceived object shape by the human lateral occipital complex," *Science*, 2001, v. 293, n. 5534, pp. 1506– 1509.

- [174] L. Zhang, M. H. Tong, T. K. Marks, H. Shan, and G. W. Cottrell, "Sun: A bayesian framework for saliency using natural statistics," *Journal of vision*, 2008, v. 8, n. 7, pp. 32–32.
- [175] S. K. Singh and R. Srivastava, "A novel probabilistic contrast-based complex salient object detection," *Journal of Mathematical Imaging and Vision*, 2019, v. 61, n. 7, pp. 990–1006.
- [176] K. Ding, L. Xiao, and G. Weng, "Active contours driven by local pre-fitting energy for fast image segmentation," *Pattern Recognition Letters*, 2018, v. 104, pp. 29–36.
- [177] K. R. Jerripothula, J. Cai, and J. Yuan, "Image co-segmentation via saliency co-fusion," *IEEE Transactions on Multimedia*, 2016, v. 18, n. 9, pp. 1896–1909.
- [178] M. Shokri, A. Harati, and K. Taba, "Salient object detection in video using deep non-local neural networks," *Journal of Visual Communication and Image Representation*, 2020, v. 68, p. 102769.
- [179] W. Wang and J. Shen, "Deep cropping via attention box prediction and aesthetics assessment," in *Proceedings of the IEEE International Conference on Computer Vision*, 2017, pp. 2186–2194.
- [180] H. Chen and Y. Li, "Three-stream attention-aware network for rgb-d salient object detection," *IEEE Transactions on Image Processing*, 2019, v. 28, n. 6, pp. 2825–2835.
- [181] Y. Hoshen, "Multi-agent predictive modeling with attentional commets," in Advances in Neural Information Processing Systems, 2017, pp. 2698–2708.
- [182] C. Szegedy, W. Liu, Y. Jia, P. Sermanet, S. Reed, D. Anguelov, D. Erhan, V. Vanhoucke, and A. Rabinovich, "Going deeper with convolutions," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2015, pp. 1–9.

- [183] X. Wang, R. Girshick, A. Gupta, and K. He, "Non-local neural networks," in Proceedings of the IEEE conference on computer vision and pattern recognition, 2018, pp. 7794–7803.
- [184] J. Al Azzeh, H. Alhatamleh, Z. A. Alqadi, and M. K. Abuzalata, "Creating a color map to be used to convert a gray image to color image," *International Journal of Computer Applications*, 2016, v. 153, n. 2, pp. 31–34.
- [185] D. P. Kingma and J. Ba, "Adam: A method for stochastic optimization," arXiv preprint arXiv:1412.6980, 2014.
- [186] S. Hong, T. You, S. Kwak, and B. Han, "Online tracking by learning discriminative saliency map with convolutional neural network," in *International conference on machine learning*. PMLR, 2015, pp. 597–606.
- [187] R. Zhao, W. Ouyang, and X. Wang, "Unsupervised salience learning for person re-identification," in *Proceedings of the IEEE conference on computer vision* and pattern recognition, 2013, pp. 3586–3593.
- [188] A. Kompella and R. V. Kulkarni, "A semi-supervised recurrent neural network for video salient object detection," *Neural Computing and Applications*, 2021, v. 33, n. 6, pp. 2065–2083.
- [189] S. Dong, Z. Gao, S. Pirbhulal, G.-B. Bian, H. Zhang, W. Wu, and S. Li, "Iotbased 3d convolution for video salient object detection," *Neural computing and applications*, 2020, v. 32, n. 3, pp. 735–746.
- [190] L. Ye, M. Rochan, Z. Liu, and Y. Wang, "Cross-modal self-attention network for referring image segmentation," in *Proceedings of the IEEE/CVF Confer*ence on Computer Vision and Pattern Recognition, 2019, pp. 10502–10511.
- [191] K. Dabov, A. Foi, V. Katkovnik, and K. Egiazarian, "Image denoising by sparse 3-d transform-domain collaborative filtering," *IEEE Transactions on image processing*, 2007, v. 16, n. 8, pp. 2080–2095.

- [192] S. Yu, B. Zhang, J. Xiao, and E. G. Lim, "Structure-consistent weakly supervised salient object detection with local saliency coherence," in *Proceedings of* the AAAI Conference on Artificial Intelligence (AAAI). AAAI Palo Alto, CA, USA, 2021.
- [193] O. Ronneberger, P. Fischer, and T. Brox, "U-net: Convolutional networks for biomedical image segmentation," in *International Conference on Medical image computing and computer-assisted intervention*. Springer, 2015, pp. 234–241.
- [194] X. Qin, Z. Zhang, C. Huang, C. Gao, M. Dehghan, and M. Jagersand, "Basnet: Boundary-aware salient object detection," in *Proceedings of the IEEE/CVF* conference on computer vision and pattern recognition, 2019, pp. 7479–7489.
- [195] A. Paszke, S. Gross, F. Massa, A. Lerer, J. Bradbury, G. Chanan, T. Killeen, Z. Lin, N. Gimelshein, L. Antiga *et al.*, "Pytorch: An imperative style, highperformance deep learning library," *Advances in neural information processing systems*, 2019, v. 32, pp. 8026–8037.
- [196] W. Ji, J. Li, M. Zhang, Y. Piao, and H. Lu, "Accurate rgb-d salient object detection via collaborative learning," in *Computer Vision–ECCV 2020: 16th European Conference, Glasgow, UK, August 23–28, 2020, Proceedings, Part XVIII 16.* Springer, 2020, pp. 52–69.

List of Publications

List of papers published/accepted in journals:

- Surya kant Singh and R. Srivastava, "A novel probabilistic contrast-based complex salient object detection," in Journal of Mathematical Imaging and Vision,vol.61, no 7, pp.990–1006,2019.10.1007/s10851-019-00882-3 (SCI-1.987).
- Surya kant Singh and R. Srivastava, "A robust RGBD saliency method with improved probabilistic contrast and the global reference surface," in Journal of The Visual Computer, pp. 1–13, Jan. 2021. DOI:10.1007/s00371-020-02050w(SCI-2.601)
- Surya kant Singh and R. Srivastava, "A robust salient object detection using edge enhanced global topographical saliency," in Multimedia Tools and Applications, vol. 79, no. 25, pp. 17885–17902, 24 Feb 2020.DOI:10.1007/s11042-020-08644-9 (SCIE-2.757).
- Surya Kant Singh and R. Srivastava, "CSA-Net: Deep Cross-complementary Self Attention and Modality-Specific Preservation for Saliency Detection," Accepted in Neural Processing Letters. (SCIE-2.908)

List of papers communicated in journals:

 Surya Kant Singh and R. Srivastava, "SL-Net: Self-Learning and Mutual Attention based Distinguished Window for RGBD Complex Salient Object Detection," in Neural Computing and Applications. (SCIE-5.606)

- Surya Kant Singh and R. Srivastava, "DGMA-Net: Deeply Guided Mutal Attention Map based RGBD Complex Salient Object Detection," in Multimedia Systems. (SCIE-1.935)
- Surya Kant Singh and R. Srivastava, "D2CA: Dynamically Divided Cascaded Automata and Self-Supervise RGBD Complex Salient Object Detection" in Pattern Recognition. (SCIE-7.818)

List of papers published in conferences:

- Surya Kant Singh and R. Srivastava, "CCL-Net: Complete Comprehensive Learning and Modality Preserving based RGBD Complex Salient Object Detection," in 4th International Conference on Machine Intelligence and Signal Processing (MISP2022), at National Institute of Technology, Raipur, India, during March 12-14, 2022.
- Surya Kant Singh and R. Srivastava, "Holistic Features and Deep Guided Depth Induced Mutual Attention based Complex Salient Object Detection," in International Conference on Data Science and Artificial Intelligence (ICDSAI) 2022, Indian Institute of Technology, Patna in collaboration with NITIE, India