

BAB VI. PENUTUP

6.1. Kesimpulan

Dalam tulisan ini, penulis mengajukan pendekatan untuk mengatasi permasalahan deteksi objek dan verifikasi wajah sekaligus dalam sebuah sistem untuk mengurangi masalah *time and accuracy trade-off*. Sistem ini kemudian disebut sebagai NoonGil Lens⁺. NoonGil Lens⁺ dengan menggunakan *Region Selection* dan *Background Complement* menunjukkan performa yang lebih baik dari segi akurasi hingga 75.2% dan kecepatan hingga 162 ms dibandingkan menggunakan *Faces Cascade* yang mempunyai akurasi hingga 67% dan kecepatan hingga 168 ms.

6.2. Saran

Akurasi *Region Selection* masih bisa ditingkatkan dengan menaikkan nilai **K** atau **G** namun kecepatan eksekusi akan berkurang. Kecepatan eksekusi juga akan menurun apabila semakin banyak jumlah identitas di *database*. Untuk mengatasi masalah tersebut, di kemudian hari penulis akan mencoba mengembangkan NoonGil menggunakan RPN dan *Anchor Boxes* untuk meningkatkan performa model dan kecepatannya.

DAFTAR PUSTAKA

- [1] A. Irons dan H. Lallie, “Digital Forensics to Intelligent Forensics,” *Futur. Internet*, vol. 6, no. 3, hal. 584–596, 2014.
- [2] A. P. Sreedevi dan B. S. S. Nair, “Image processing based real time vehicle theft detection and prevention system,” *Proc. 2011 Int. Conf. Process Autom. Control Comput. PACC 2011*, 2011.
- [3] Pertuni, “Siaran Pers: Peran Strategis Pertuni Dalam Memberdayakan Tunanetra Di Indonesia.,” 2017. [Daring]. Tersedia pada: <https://pertuni.or.id/siaran-pers-peran-strategis-pertuni-dalam-memberdayakan-tunanetra-di-indonesia/>. [Diakses: 28-Apr-2021].
- [4] J. Redmon, S. Divvala, R. Girshick, dan A. Farhadi, “You only look once: Unified, real-time object detection,” *Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit.*, vol. 2016-Decem, hal. 779–788, 2016.
- [5] F. Schroff, D. Kalenichenko, dan J. Philbin, “FaceNet: A unified embedding for face recognition and clustering,” *Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit.*, vol. 07-12-June, hal. 815–823, 2015.
- [6] J. Redmon, “[Yolov3]YOLOv3: An Incremental Improvement,” 2017.
- [7] R. Girshick, J. Donahue, T. Darrell, dan J. Malik, “Rich feature hierarchies for accurate object detection and semantic segmentation,” *Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit.*, vol. 1, hal. 580–587, 2014.
- [8] E. Hanna dan M. Cardillo, “Faster R-CNN2015,” *Biol. Conserv.*, vol. 158, hal. 196–204, 2013.
- [9] Y. Jia *et al.*, “Caffe: Convolutional architecture for fast feature embedding,” *MM 2014 - Proc. 2014 ACM Conf. Multimed.*, hal. 675–678, 2014.
- [10] J. R. R. Uijlings, K. E. A. Van De Sande, T. Gevers, dan A. W. M. Smeulders, “Selective search for object recognition,” *Int. J. Comput. Vis.*, vol. 104, no. 2, hal. 154–171, 2013.
- [11] J. Redmon dan A. Farhadi, “Yolo V2.0,” *Cvpr2017*, no. April, hal. 187–213, 2017.

- [12] X. Long *et al.*, “PP-YOLO: An effective and efficient implementation of object detector,” *arXiv*, 2020.
- [13] Y. Taigman, M. A. Ranzato, T. Aviv, dan M. Park, “Taigman_DeepFace_Closing_the_2014_CVPR_paper.”
- [14] S. Chopra, R. Hadsell, dan Y. LeCun, “Learning a similarity metric discriminatively, with application to face verification,” *Proc. - 2005 IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognition, CVPR 2005*, vol. I, no. May 2014, hal. 539–546, 2005.
- [15] I. Melekhov, J. Kannala, dan E. Rahtu, “Siamese network features for image matching,” *Proc. - Int. Conf. Pattern Recognit.*, vol. 0, hal. 378–383, 2016.
- [16] K. Rungta, “TensorFlow in 1 Day : Make your own Neural Network,” hal. 449, 2018.
- [17] R. S. Chityala, *Image Processing and Acquisition using Python*. CRC Press, 2014.
- [18] B. Jähne, *Digital Image processing*, 6th revise. Springer, 1997.
- [19] R. C. Gonzalez dan R. E. Woods, *Digital image processing (2nd edition)*. 2002.
- [20] Z. Liu, P. Luo, X. Wang, dan X. Tang, “Deep learning face attributes in the wild,” *Proc. IEEE Int. Conf. Comput. Vis.*, vol. 2015 Inter, hal. 3730–3738, 2015.
- [21] G. B. Huang, M. Mattar, T. Berg, E. L. Labeled, R. Images, dan E. Learned-miller, “Labeled Faces in the Wild : A Database for Studying Face Recognition in Unconstrained Environments,” *Work. faces in'Real-Life'Images Detect. alignment, Recognit.*, 2008.
- [22] K. Zhang, Z. Zhang, Z. Li, dan Y. Qiao, “Joint Face Detection and Alignment Using Multitask Cascaded Convolutional Networks,” *IEEE Signal Process. Lett.*, vol. 23, no. 10, hal. 1499–1503, 2016.
- [23] I. Centeno, “MTCNN.” [Daring]. Tersedia pada: <https://pypi.org/project/mtcnn/>.
- [24] J. Wang dan L. Perez, “The effectiveness of data augmentation in image

classification using deep learning,” *arXiv*, 2017.

- [25] “YOLOv3 Tensorflow 2.0 Implementation.” [Daring]. Tersedia pada: <https://github.com/zzh8829/yolov3-tf2>.
- [26] S. Ioffe dan C. Szegedy, “Batch normalization: Accelerating deep network training by reducing internal covariate shift,” *32nd Int. Conf. Mach. Learn. ICML 2015*, vol. 1, hal. 448–456, 2015.
- [27] C. Cortes, G. Research, dan N. York, “L 2 Regularization for Learning Kernels,” *Proc. Twenty-Fifth Conf. Uncertain. Artif. Intell.*, 2004.
- [28] C. Szegedy *et al.*, “Going Deeper with Convolutions,” 2015.
- [29] M. J. Viola, Paul; Jones, “Robust Real-Time Face Detection,” *Int. J. Comput. Vis.*, hal. 137–154, 2004.

