Real- Time Object Detection for Blind People

P. Bharathi[1], B. L. D. Spurthy[2], A. Bhavani Priya[3], B. Yashvardhan Krishna Murthy[4],
CH. Charan Sai Varaha Teja[5]

Assistant Professor, Department of Computer Science and Engineering[1]
Student, Department of Computer Science and Engineering[2,3,4,5]
Raghu Institute of Technology, Visakhapatnam, AP, India

Abstract: *Object detection and warning can improve the mobility as well as the safety of visually impaired people specially in unfamiliar environments. For this, firstly, objects are detected and localized and then the information of the objects will be sent to the visually impaired people by using different modalities such as voice. In this paper, we present an assistive system for visually impaired people based on TensorFlow object detection model and Google Speech's model. This system consists of two main factors: environment information acquisition and analysis and information representation. The first element aims at capturing the environment by using TensorFlow object detection model and analyzing it in an order to detect the predefined objects for visually impaired people, while the second element tries to represent object's information under the form of a speech to visually disabled person.*

Keywords: Object detection, TensorFlow, modalities, Vision defects, Google Speech's model

REFERENCES

[1]. ."A navigational aid for persons with severe visual impairments: A project in progress," in Proc. Int. Conf. IEEE Eng. Med Biol. Soc., Cancun, Mexico, Sep. 17-21, 2003.

[2]. S. Maeyama, A. Ohya, and S. Yuta, "Positioning by tree detection sensor and dead reckoning for outdoor navigation of a mobile robot, " in IEEE Int. Conf. Multisensor Fusion and Integration for Intelligent Systems '94, pp. 653-660, 1994.

[3]. B. Andò, "A smart multisensory approach to assist blind people in specific urban navigation tasks, " IEEE Transactions Neural Systems and Rehabilitation Engineering, vol. 16, no. 6, pp. 592-594, Dec. 2008.

[4]. J.K. Sung, Y.H. Kim, and H.K. In, "Development of an intelligent guide-stick for the blind, " in IEEE Proc. Int. Conf. Robotics and Automation, vol. 4, pp. 3208-3213, 2001.

[5]. J. Rudan and Z. Tuza. Using LMS-100 laser rangefinder for indoor metric map building. In Proceedings of 2010 IEEE International Symposium on Industrial Electronics (ISIE2010). IEEE ISIE, 2010.

[6]. R. Ani, E. Maria, J.J. Joyce, V. Sakkaravarthy, M.A. Raja, "Smart Specs: Voice Assisted Text Reading system for Visually Impaired Persons Using TTS Method", IEEE International Conference on Innovations in Green Energy and Healthcare Technologies (IGEHT), Coimbatore, India, Mar. 2017.

[7]. James Kirkpatrick, Razvan Pascanu, Neil Rabinowitz, Joel Veness, Guillaume Desjardins, Andrei A Rusu, Kieran Milan, John Quan, Tiago Ramalho, Agnieszka GrabskaBarwinska, Demis Hassabis, Claudia Clopath,

[8]. Dharshan Kumaran, and Raia Hadsell. Overcoming catastrophic for getting in neural networks. In Proceedings of the National Academy of Sciences, volume114, pages 3521–3526, 2017.

[9]. X. Zhu, Y. Xiong, J. Dai, L. Yuan, and Y. Wei. Deep featureflow for video recognition. InCVPR, 2017.

[10]. B. Jacob, S. Kligys, B. Chen, M. Zhu, M. Tang, A.Howard,H. Adam, and D. Kalenichenko. Quantization and Trainingof neural networks for efficient integerarithmetic-only infer-ence, InCVPR, 2018.

[11]. M. Liu, M. Zhu, and Y. Li. Tensorflow mobile video object detection. https://github.com/tensorflow/models/tree /master/research/lstmobjectdetection, 2018.

[12]. T.-Y. Lin, P. Doll´ar, R. B. Girshick, K. He, B. Hariharan, andS. J. Belongie. Feature pyramid networks for object detec-tion. InCVPR, 2017.

[13]. B. Jacob, S. Kligys, B. Chen, M. Zhu, M. Tang, A. Howard,H. Adam, and D. Kalenichenko. Quantization and training of neural networks for efficient integer-arithmetic only inference. InCVPR, 2018.

[14]. Jang Y., Shin S., Lee J. W., and Kim S., "A preliminary study for portable walking distance measurement system using ultrasonic sensors," Proceedings of the 29th Annual IEEE International Conference of the EMBS, France, Aug. 2007, pp. 5290-5293.

[15]. Webster D., "A pulsed ultrasonic distance measurement system based upon phase digitizing," IEEE Transaction on Instrumentation and Measurement, Vol. 43, No. 4, Aug. 1994, pp. 578- 582.

[16]. Sharma P., Shimi S. L., Chatterji S., "A Review on Obstacle Detection and Vision", International Journal of Engineering Sciences &Research Technology [Sharma, 4(1): January, 2015] ISSN: 2277-9655 Pp1-11.

[17]. Maher M. Abdel-Aziz, Wael M. Khalif., "Smart Blind Guidance System", International Journal of Emerging Trends in Electrical and Electronics (IJETEE – ISSN: 2320-9569) Vol. 11, Issue. 7, Nov2015.pp1-9