

Supermarket Analytics

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Abstract

Emotion recognition from facial expressions is a crucial task in computer vision with potential applications in a variety of fields, including human-computer interaction, psychology, and marketing. In this paper, we propose a deep learning-based approach to detect emotions from images, and we conduct a comparative study of several state-of-the-art models. We use publicly available datasets to train and evaluate the models. Our study provides insights into the design of deep learning-based model for emotion recognition and suggests potential avenues for future research.

Keywords- facial expression, face detection, customer behavior, analysis, business insight

I. INTRODUCTION

In recent years, there has been a growing interest in using computer vision techniques to analyze customer behavior in retail environments, such as supermarkets. The use of emotion in marketing has emerged as a new trend that enables businesses to comprehend consumer sentiment towards their offerings. The majority of businesses currently rely on traditional marketing strategies that lack emotional responses and are based on advertising, pricing, selling points, and satisfaction surveys, among other things.

One important aspect of customer behavior is emotional response, which can provide valuable insights into customer satisfaction and engagement. Emotion detection from facial expressions has the potential to improve customer experience and increase sales in supermarkets by enabling real-time monitoring of customer sentiment.

In this paper, we propose a deep learning-based approach to detect emotions from images captured by surveillance cameras in a supermarket. Our approach involves training a convolutional neural network (CNN) on a large dataset of annotated facial images to recognize seven basic emotions (happy, sad, angry, surprised, disgusted, neutral and fearful). We then apply the trained model to real-time video streams to detect and classify emotions of customers in the supermarket.

III. IMPLEMENTATION

The project is implemented in three steps namely Data Collection, Data processing, Emotion analysis and decision. Collection of a set of image sequences on behaviors of an unlimited number of consumers, and during different periods, to a new product provided by enterprise. These images are those containing only faces. Afterwards, data processing (face and emotions detection). Finally, the analysis of these resulting emotions that generate values for the enterprise,

which aims to extract business intelligence about how the product is perceived by consumers. The face detection procedure is an essential step for the relevance of our system. For our project we chose to use the latter approach to treat the problem of face detection as a classification problem. In order to determine whether an image belongs to the class of faces or non-faces we use deep learning algorithm. Finally, we classify detected emotions as expressing as happy, sad, angry, surprised, disgusted, neutral and fearful opinion towards a product, we have used Haar Cascade for data classification and from these result, the enterprise constitutes an opinion on the impact of this product on the customer. Overall, this methodology provides a simple, step-by-step process for implementing and usage of Super market analytics. With its proper classification of consumer's emotion helps the enterprise to derive the analytics w.r.t to sales pitch.

IV. ARCHITECTURE

Diagram shows the stages of project as image storage ,processing, analysis and decision. Data is collected with the help of camera. The stored image data is processed for face and emotion detection and hence the analysis is performed to get the desired output for business insight.

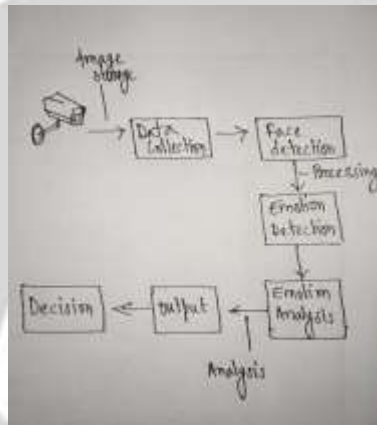


Fig High level overview of supermarket analytics

II. CONCLUSION

In summary, our paper presents a deep learning-based approach for detecting emotions from images captured by surveillance cameras in a supermarket. Our approach achieved high accuracy in real-time emotion detection and provided valuable insights into customer behavior and preferences. The proposed approach has potential applications for improving customer experience and increasing sales in retail environments, and future work can explore further extensions and integrations with retail analytics tools. The findings of the study can be beneficial for supermarket owners and marketers to better understand consumer behavior and design targeted marketing strategies.

Overall, our study contributes to the growing field of computer vision and deep learning in retail analytics, highlighting the potential for advanced techniques to provide actionable insights for improving customer experience and increasing sales.

V. REFERENCES

- [1] Desmet P. M. A. and P. Hekkert, "The basis of product emotions", In W. Green and P. Jordan (Eds.), *Pleasure with Products, Beyond usability*, pp. 60-68, London.
- [2] My smail Bouzakraoui, Sadiq abdelalim, Nouridine Neya *International Journal of Scientific & Engineering*

Research, Volume 7, Issue 11, November-2016 ISSN 2229- 5518” Towards a Framework for Customer Emotion Detection”.

[3] A. Mehrabian, “Communication without words,” *Psychology today*, vol. 2, pp. 53– 56, 1968.

[4] Viola P. and Jones, M., "Rapid Object Detection Using a Boosted Cascade of Simple Features", IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Vol. 1, pp. 511-518, 2001

