IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, September 2022
Impact Factor: 6.252

# Mixed Reality Based Application for Bidding System

**Nalini Karmat and Kshitija Potdar**
Department of Computer Engineering
DholePatil College of Engineering, Pune, Maharashtra, India
Savitribai Phule Pune University, Pune, Maharashtra India

**Abstract:** *Augmented Reality and Mixed Reality applications are being used in multiple domains to improve efficiency of the system and adding new features. Auctions/Bidding systems are there in market for long time and are being used widely by many users. This paper focusses on how Mixed Reality and Augmented Reality can be used to provide new and intuitive experience to the users. Objective behind using AR/MR in the bidding system is augmenting the actual bidding experience, a user can get in physical environment to be made available virtually.AR based applications are intuitive and have introduced new kind of user interface which can be explored according to users will and natural gestures. Combining AR/MR with Cloud to provide real time updates on current bid. As bidding/auction systems need to be updated instantly and current bid value needs to be shown. Paper proposes how AR/MR with YOLO detection can be used with Cloud technologies to achieve real-time, robust bidding system with intuitive user interface.*

**Keywords:** Augmented Reality, Mixed Reality, Cloud, Real- Time, YOLO (You Only Look Once)

## I. INTRODUCTION

Augmented Reality and Mixed Reality applications are mostly popular in areas like gaming and simulation and have huge user base but AR/MR can be beneficial in other areas too.

Augmented Reality and Mixed Reality is currently 22 Billion $ industry and is projected to 252 Billion $ in 2028 according to survey from *statistica* [1]. As AR and MR are growing technologies many businesses are trying to align their products with AR and MR.

Augmented Reality in Bidding/Auction systems is a promising area where AR/MR technologies can be fully utilized to provide better user experience.

Paper proposes different components of the system and results for the prototypes developed

## II. YOLO DETECTION FOR MR

YOLO (You Only Look Once) is an Object detection algorithm known for the faster image processing and multi-marker support. YOLO was highlighted in OpenCV People's Choice Award according to original paper published *"We reframe object detection as a single regression problem, straight from image pixels to bounding box coordinates and class probabilities".[1]*

As paper describes YOLO object detection provides faster output and recent enhancements YOLOv2 speed of the algorithm is 45 Frames per seconds which is almost real-time which is requirement in bidding system as online bidding systems are really fast and user needs to get updated bids in real time. Using YOLO is also one of the reasons as it can detect multiple objects in one scan.

Proposed application uses YOLO to create CNN (Convolutional Neural Network) model which takes images as input and gives recognized objects and their bounding boxes location which helps in this application as we want to highlight the detected objects and show current bid value on top of the objects detected. Also, application requires training data for the items to be shown in bidding. Model will be trained with these objects training data and when scanned these objects user will be able to see current bid on top of the object. This method of bidding is chaos free and provides more accuracy also users will be able to see interested bidders and their status in real time.

As we have taken care of the image detection, we have to geo tag the objects as the objects will be placed in stationary location which wont change at the time of action we need to store this information in the database which leads to the next component

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, September 2022
Impact Factor: 6.252

## III. Cloud For Real-Time Updates

Cloud technologies are in separable parts of modern applications as applications with large user base requeues huge number of resources and managing up scaling and down scaling is a challenge as in applications like bidding systems

users join the rooms and leave rooms rapidly in such cases allocating and deallocating is a tricky and challenging part but with right configuration these operations can be achieved using cloud.

This application requires real-time updates as users will be placing there bids rapidly on the object this information needs to be displayed instantly as user will want to know the highest bid on the selected object or multiple objects which are scanned using algorithm. For this we require Database which will trigger events and give call- back to the application indicating data change in the database for the POC (Proof Of Concept) of the application we have used Firebase Real-Time Database There are many alternatives for the database depending on the cloud service provider as amazon provides Dynamo DB.

Using cloud database with real time feature will help in faster updates and we can reduce the latency providing accurate results and robustness in the system due reuse of well tested cloud products. Also the client i.e. device used by the user will be smart phones so the application will be developed for smartphones using cloud service provider wisely is important factor as many cloud service providers don't provide SDK's or Documentation for native devices which affects the development time.

## IV. Using Smartphones for Scanning

Smartphones are widely accessible devices and Necessity in today's world. Smartphones have improved so much in recent years and will improve in future as well. In terms of computation smartphones have improved drastically on device machine learning is possible due to high performing mobile processors and larger ram size.

Also, Camera sensor for smartphones in current far more accurate and provide better resolutions. Average Megapixel size of the new smartphones being launched is 12-16 MP world-wide in 2022.

For proposed system we can utilize these features of the mobile camera as mobiles are portable installing single application will let users to connect to the system and place bid's.

Although new smartphones have great computational powers as smartphone providers have their own restrictions and application needs to perform within the bounds of the system this need's to be taken care while developing the application.

## V. Conclusion

After studying and developing the POC of the application we can conclude on some points of the system and how this will enhance current bidding systems

**A. Frames drop (Frames processed by application per seconds)**

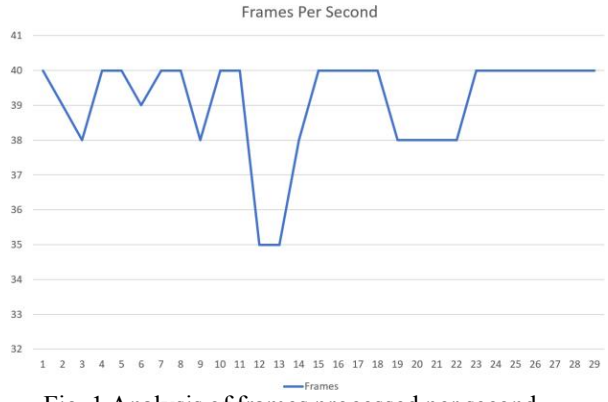


Fig. 1 Analysis of frames processed per second

As can be seen form the figure above it can be concluded application performs faster object detection and will show updates in real time above results are from on device machine learning on smartphone with 6GB Ram and Octa Core 2.3 GHz processor

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, September 2022
Impact Factor: 6.252

**B. Latency of Database**

As application uses real time database solution provided from the cloud service providers with smaller load i.e. 1000 ~ users in simulated environment application has 0.01s~ (10 ms) latency

It can be concluded from the results Using mixed reality for bidding system is feasible and can provide great experience to users.

## REFERENCES

**[1].** Statista. 2022. VR/AR market size 2024 | Statista. [online] Available at: <https://www.statista.com/statistics/591181/global-augmented-virtual- reality-market-size/> [Accessed 7 May 2022].Statista. 2022. VR/AR market size 2024 | Statista. [online] Available at: <https://www.statista.com/statistics/591181/global-augmented-virtual- reality-market-size/> [Accessed 7 May 2022].

**[2].** Redmon, J. and Divvala, S., 2016. You Only Look Once: Unified, Real-Time Object Detection. cs.CV,.

**[3].** M. B. Blaschko and C. H. Lampert. Learning to localize ob jects with structured output regression. In Computer Vision–ECCV 2008, pages 2–15. Springer, 2008.

**[4].** L. Bourdev and J. Malik. Poselets: Body part detectors trained using 3d human pose annotations. In International Conference on Computer Vision (ICCV), 2009.

**[5].** N. Dalal and B. Triggs. Histograms of oriented gradients forhuman detection. In Computer Vision and Pattern Recogni tion, 2005. CVPR 2005. IEEE Computer Society Conference on, volume 1, pages 886–893. IEEE, 2005

**[6].** T. Dean, M. Ruzon, M. Segal, J. Shlens, S. Vijaya narasimhan, J. Yagnik, et al. Fast, accurate detection of 100,000 object classes on a single machine. In Computer Vision and Pattern Recognition (CVPR), 2013 IEEE Confer ence on, pages 1814–1821. IEEE, 2013.

**[7].** J. Donahue, Y. Jia, O. Vinyals, J. Hoffman, N. Zhang,E. Tzeng, and T. Darrell. Decaf: A deep convolutional acti vation feature for generic visual recognition. arXiv preprint 2013.

**[8].** J. Dong, Q. Chen, S. Yan, and A. Yuille. Towards unified object detection and semantic segmentation. In Computer Vision–ECCV 2014, pages 299–314. Springer, 2014.

**[9].** D. Erhan, C. Szegedy, A. Toshev, and D. Anguelov. Scalable object detection using deep neural networks. In Computer Vision and Pattern Recognition (CVPR), 2014 IEEE Confer ence on, pages 2155–2162. IEEE, 2014.

**[10].** M. Everingham, S. M. A. Eslami, L. Van Gool, C. K. I. Williams, J. Winn, and A. Zisserman. The pascal visual ob ject classes challenge: A retrospective. International Journal of Computer Vision, 111(1):98–136, Jan. 2015

**[11].** P. F. Felzenszwalb, R. B. Girshick, D. McAllester, and D. Ra manan. Object detection with discriminatively trained part based models. IEEE Transactions on Pattern Analysis and Machine Intelligence, 32(9):1627–1645, 2010.