

DISCUSSION ON VIEW MANAGEMENT METHODS IN MOBILE AUGMENTED REALITY SCENARIOS

Ceren Kayalar // ckayalar@sabanciuniv.edu

INTRODUCTION

Augmented Reality (AR) applications annotate the real world with virtual objects in real-time

AR annotation Virtual information that describes in some way, and is registered to, an existing object

View Management defines visual constraints on the projections of objects on the view plane, such as:

- preventing overlaps on other annotations,
 - ensuring visibility of and relevance to real counterparts
- related to: cartography, cognitive science, information visualization

Not applied to mobile AR scenarios yet

ONGOING STUDY

Use Case User is observing an urban scene in augmented reality view where some target objects are near and some of them are far.

Point features--> Azuma's methods

Area features--> Bell's method

Location + size of the POI are important

Lab test Placing labels for dials on an audio mixer panel

- Greedy algorithm (if the user's or the real world situation changes dramatically)
- Gradient-descent algorithm
- Cluster based method (if the user does not translate much)



Figure 1: Bell's prototype (top) Azuma's study results: randomly placed labels (middle), cluster based method result (bottom)

Test Platform Android 2.1 on Samsung Galaxy S and Samsung Galaxy Tab

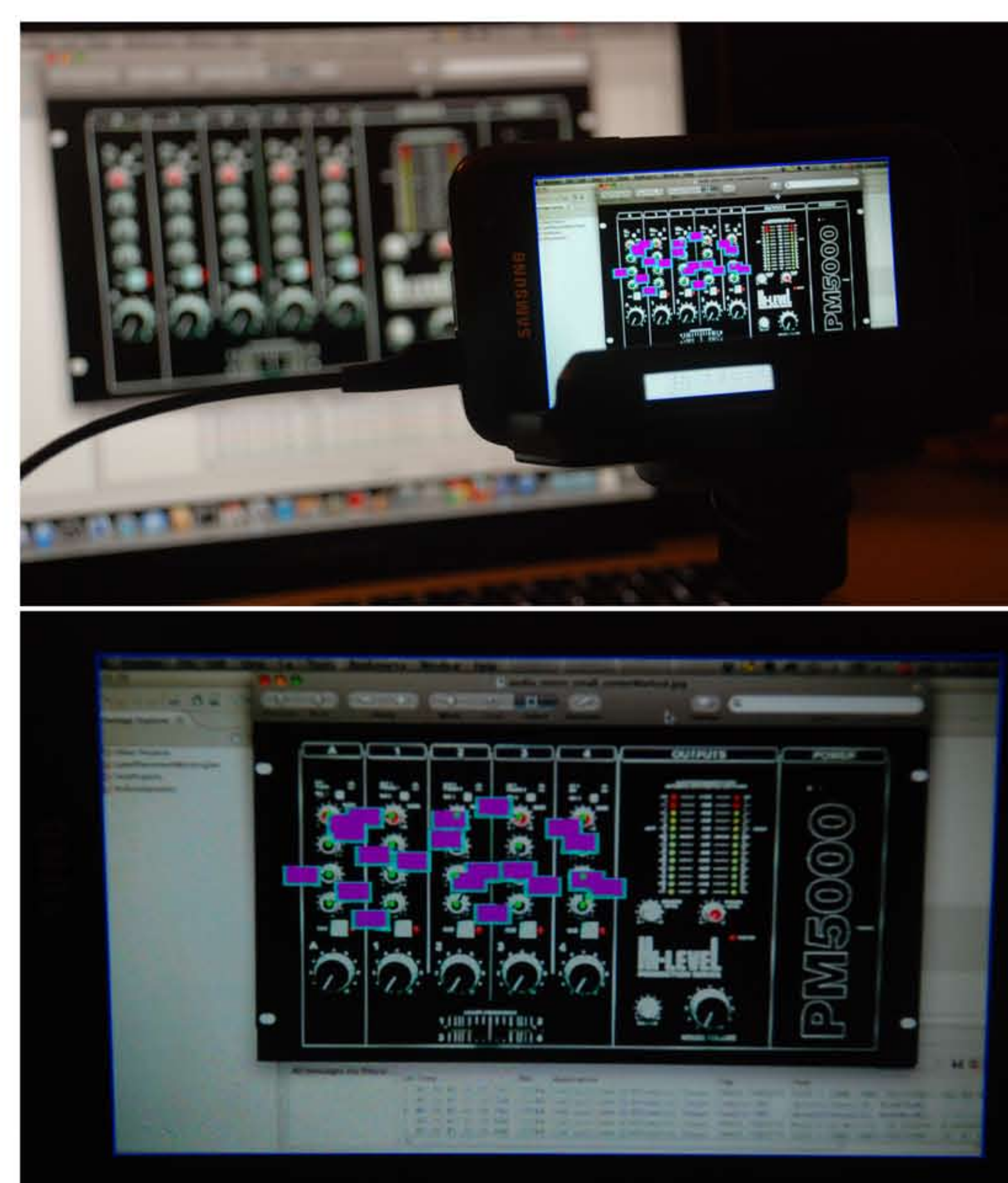
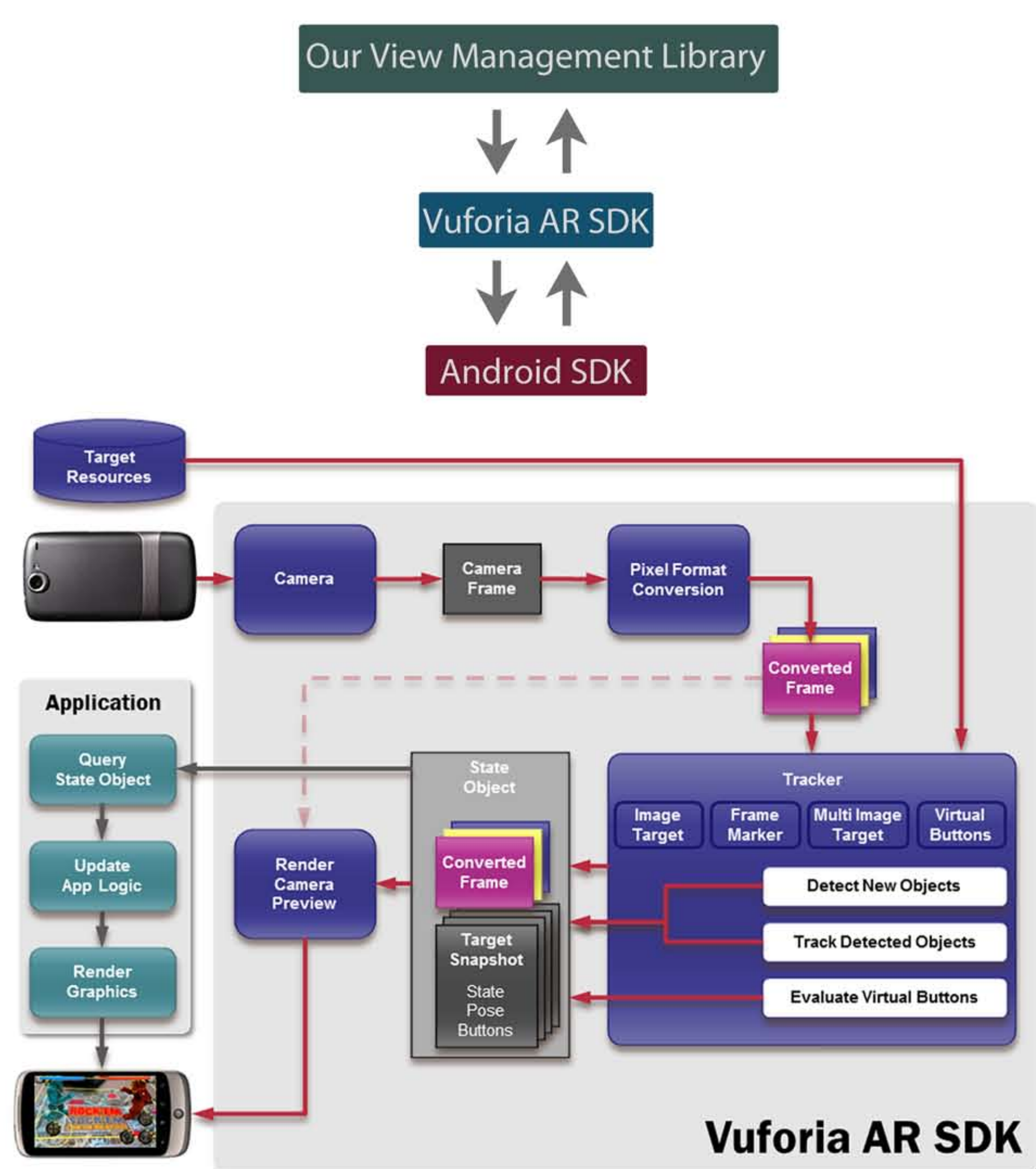


Figure 2: Observing the scene from a third person view (top), detailed capture from the android device's screen (bottom)

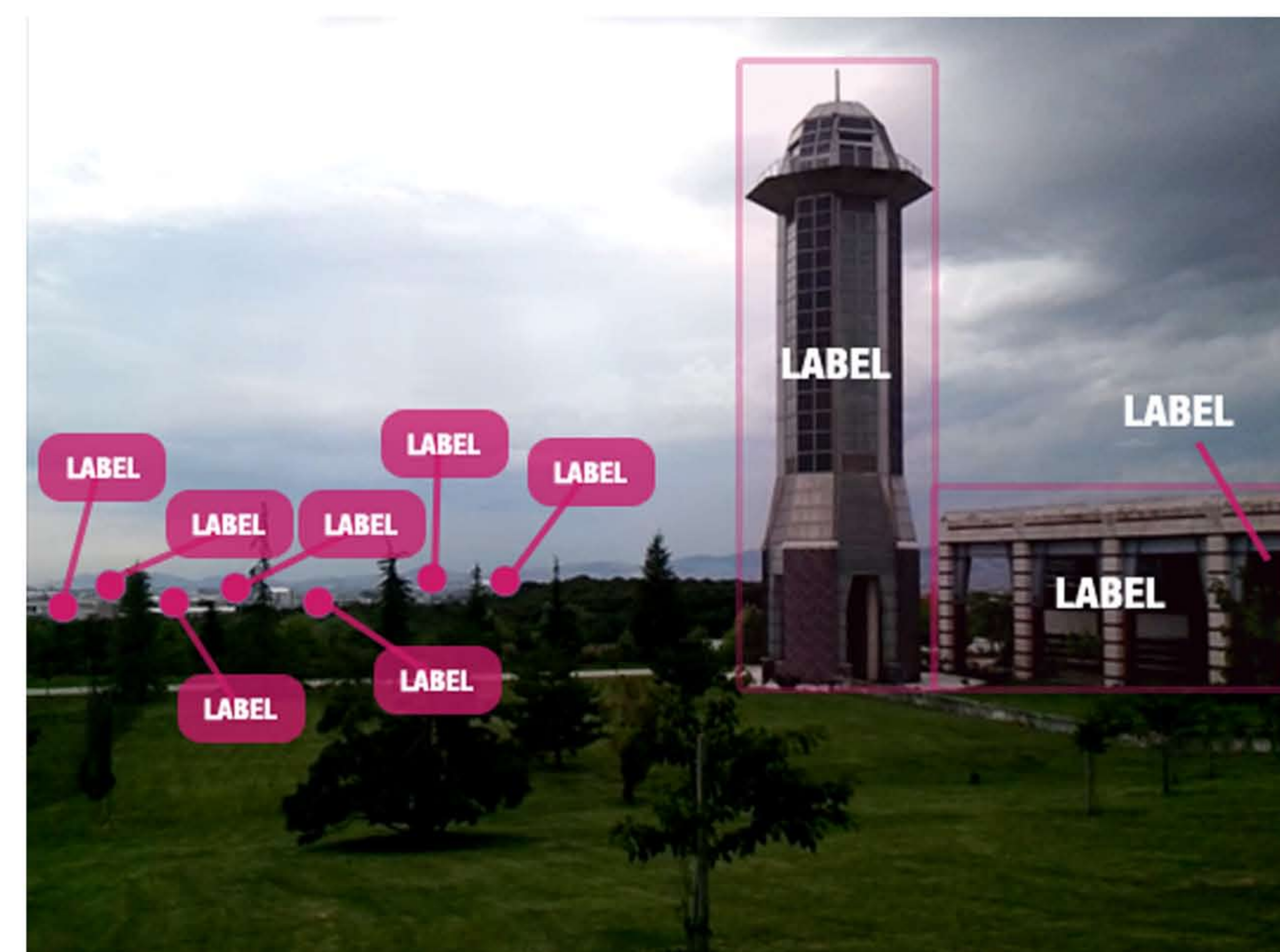


Figure 3: Different location complexities in one scene (Concept drawing) Far objects appear to be almost point sized (left). Closer objects occupy some rectangular area on the view plane (right)

RESEARCH QUESTIONS

How to place text labels on a real world scene so that the labels are clearly readable and the user perceives additional information about the real world without getting distracted by occluded labels or labels occluding important points of interest (POI)

Would it be possible to apply Bell et al.'s method to an outdoor augmented reality scenario, where the camera is a mobile phone and the scene is an urban environment?

In a crowded outdoor mobile AR scenario, where all labels have to be placed on the scene, which label placement algorithm performs better?

REFERENCES

Azuma, R. and Furmanski, C. Evaluating label placement for augmented reality view management. In Proc. The Second IEEE and ACM International Symposium on Mixed and Augmented Reality, (2003). 66-75
 Bell, B., Feiner, S., and Höllerer T. View management for virtual and augmented reality. In Proc. 14th annual ACM symposium on User interface software and technology, UIST (2001).
 Wither, J., DiVerdi, S., and Höllerer, T. Annotation in outdoor augmented reality. Computers & Graphics, (2009), 33(6):679-689.

