A TEMPLATE FOR THE *arxiv* STYLE

ECE269 PROJECT REPORT

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1 Introduction

Following the "Eigenface" technique proposed by Matthew, et al. (1995) [1][2], we derive eigenfaces (obtained via PCA) from face image dataset. We use these eigenfaces (also known as principal components) to reconstruct different kinds of images and evaluate the result via computing MSE. In section 2, we will cover a simplified description of how the PCs are calculated and reconstruction is done. Combining with the singular values plot, we will give our justification of those PCs. Section 3-5 are about reconstruction result using images from 190 individuals' neutral expression image set, from 190 individuals' smiling expression image set and from the other 10 individuals' neutral expression image set. In section 6, we will reconstruct non-human images using all the PCs and evaluate the result. Section 7 is to reconstruct rotated images and our comment of the result.

2 Singular values plot and justification of PCs

2.1 Simplified description of PC computation and reconstruction

2.2 Singular values plot

The following figure is the singular values plot from data matrix.

2.3 Justification and explaination

3 Examples of citations, figures, tables, references

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The documentation for `natbib` may be found at

`http://mirrors.ctan.org/macros/latex/contrib/natbib/natnotes.pdf`

Of note is the command `\citet`, which produces citations appropriate for use in inline text. For example,

```
\citet{hasselmo} investigated\dots
```

produces

Table 1: Sample table title

	Part	
Name	Description	Size (μm)
Dendrite	Input terminal	$\sim$100
Axon	Output terminal	$\sim$10
Soma	Cell body	up to 10^6

Hasselmo, et al. (1995) investigated...

`https://www.ctan.org/pkg/booktabs`

3.1 Figures

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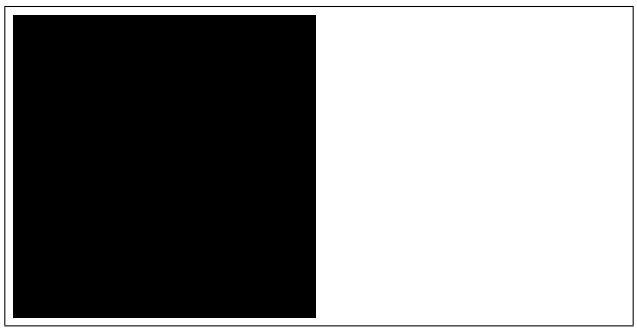

Figure 1: Sample figure caption.

3.2 Tables

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3.3 Lists

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- consectetur adipiscing elit.
- Aliquam dignissim blandit est, in dictum tortor gravida eget. In ac rutrum magna.

[1] Sample of the first footnote.

References

[1] Matthew A Turk and Alex P Pentland. Face recognition using eigenfaces. In *Proceedings. 1991 IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, pages 586–591. IEEE, 1991.

[2] Matthew Turk and Alex Pentland. Eigenfaces for recognition. volume 3, pages 71–86. MIT Press, 1991.