

PHANWADEE SINTHONG and THEANO STAVRINOS
University of California, Los Angeles, CS259

Categories and Subject Descriptors:

■

1. INTRODUCTION

“Walt Disney once said to his animation team that the audience watches the eyes and this is where the time and money must be spent if the character is to act convincingly”.

APPENDIX

A. CLASSICAL MULTIDIMENSIONAL SCALING

Let D be an $n \times n$ matrix of pairwise distances. The matrix D is symmetric with a zero diagonal. We are interested in finding a $d \times n$ matrix X where each column \mathbf{x}_i is the representation of the point i in R^d and $D_{ij} = \|\mathbf{x}_i - \mathbf{x}_j\|_2$. Denote the inner product (or Gram matrix) for this set of points by $K = X^T X$.

K is an $n \times n$ symmetric positive semidefinite matrix. Let us now abuse notation and use D^2 to indicate the matrix of squared pairwise distances $K = -\frac{1}{2}(I - \mathbf{1}\mathbf{1}^T)D^2(I - \mathbf{1}\mathbf{1}^T)$. Here, I is the $n \times n$ identity matrix and $\mathbf{1}$ is the n -vector of all ones.

ACKNOWLEDGMENTS

We are grateful to the following people for resources, discussions and suggestions: Prof. Jacobo Melamed Cattán (Ophthalmology-UFRGS), Prof. Roberto da Silva (UFRGS), Prof. Luis A. V. Carvalho (Optics-USP/SC), Prof. Anatolio Laschuk (UFRGS), Leandro Fernandes, Marcos Slomp, Leandro Lichtenfelz, Renato Silveira, Eduardo Gastal, and Denison Tavares. We also thank the volunteers who allowed us to collect pictures and videos of their irises: Alex Gimenes, Boris Starov, Christian Pagot, Claudio Menezes, Giovane Kuhn, João Paulo Gois, Leonardo Schmitz, Rodrigo Mendes, and Tiago Etienne.

Received December 2014; accepted December 2014