**Accurate Eye Location tracking system**

**Abstract**

The ubiquitous application of eye tracking is precluded by the requirement of dedicated and expensive hardware, such as infrared high definition cameras. Therefore, systems based solely on appearance (i.e. not involving active infrared illumination) are being proposed in literature. However, although these systems are able to successfully locate eyes, their accuracy is significantly lower than commercial eye tracking devices. Our aim is to perform very accurate eye center location and tracking, using a simple web cam. By means of a novel relevance mechanism, the proposed method makes use of isophote properties to gain invariance to linear lighting changes (contrast and brightness), to achieve rotational invariance and to keep low computational costs. The proposed method we test our approach for accurate eye location and robustness to changes in illumination and pose, using the BioID and the Yale Face B databases, respectively. We demonstrate that our system can achieve a considerable improvement in accuracy over state of the art techniques.