



## Master's Thesis Proposal

### General Information

Master's Thesis Title: **Computer vision techniques for intelligent mirrors.**  
Publication Date: 14/11/2010  
Expiry Date: 14/11/2011  
Modality:  technological project  
          x    research work  
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Observations:  
Student's Name:  
(if already known)

### M.Sc. Thesis Description

Brief Description: (a 4-5 lines long paragraph)

An intelligent mirror system is a human-friendly human-computer interaction system using a mirror and some human-computer interface. When a user stands up in front of the intelligent mirror system, the system can recognize him/her by using biometric techniques. The objective of this project is to be able to extract present colours in your clothes in order to build a visual description of the colours you wear during long periods of time.

Detailed Description: (a half-page or one-page description, may include a brief task planning)

With the emergence of ubiquitous and pervasive computation, distributed devices embedded in the natural human environment are getting more and more intelligent. This enables more advanced multimedia services far beyond simple video streaming and communication services. These services are currently on the brink of emergence, and include, e.g., personalized media environments, smart homes, semantic locative media, and context aware computer systems. Intelligent mirrors are a probable artifact that in a near future will allow the deployment of personalized media environments.

The objective of this project is to develop a proof-of-concept system based on the automatic perception of user clothes. The system will record any appearance of the user in front of the mirror (users can be recognized by using off-the-shelf face recognition technologies) in order to build a visual model of the color palette the user is wearing during a long period of time.

The tasks to be developed are:

1. To make a state-of-the-art survey about intelligent mirror technologies.
2. To implement a face detection and recognition module for user recognition.

3. To implement a robust segmentation module in order to determine the colors present in user's clothes.
4. To design an implement a visualization strategy (see, for example, <http://hint.fm/projects/flickr/>)

References: (bibliographical references, relevant web links, etc.)

1. Fujinami, K., Kawsar, F., Nakajima, T.: AwareMirror: a personalized display using a mirror. In: Proceedings of Pervasive, pp. 315–332 (2005)
2. Begole, B., Matsumoto, T., Zhang, W., Liu, J.: Responsive mirror: fitting information for fitting rooms. In: Proceedings of Workshop on Ambient Persuasion at Computer/Human Interaction (CHI) Conference (2008)
3. Haritaoglu, I., Flickner, M.: Attentive billboards. In: Proceedings of International Conference on Image Analysis and Processing (ICIAP), pp. 162–167 (2001)
4. Iwabuchi, E., Nakagawa, M., Siio, I.: Smart makeup mirror: computer-augmented mirror to aid makeup application. HCI International in LNCS, vol. 5613, pp. 495–503. Springer, Berlin (2009)
5. Lee, D., Park, J., Lee, M., Hahn, M.: Personalized magic mirror: interactive mirror based on user behavior. In: Proceedings of 5th International Conference on Smart Homes and Health Telematics (ICOST), Nara, Japan, pp. 162–169 (2007)

Minimal Requirements & Previous Knowledge: (optional)

The research profile of the candidates should cover as much as possible:

- Programming experience in C or C++ and Matlab is compulsory.
- Written and verbal communication skills in English.

Additional comments: (optional)

Location and Date: Barcelona, 9/11/2010

**To the Academic Commission of the Master in Artificial Intelligence (CAIMIA)**