

# Automatic Memory Selection via Novelty Detection

Omid Aghazadeh, Josephine Sullivan and Stefan Carlsson

Computer Vision and Active Perception laboratory, KTH, Sweden

{omida,sullivan,stefanc}@csc.kth.se

## Abstract

A small video camera attached to the body of a person can record essentially the same view as the person's own visual system. Users of the Microsoft SenseCam exploit this fact and already the benefit of such footage for memory therapy has been demonstrated [2]. Undoubtedly, these systems would profit from the automatic extraction of memorable images. Although work exists which pursues this direction, see [3], in general this is still an ill-defined problem. If we, however, restrict the concept of memorable to that of novelty, an important factor in the creation of new memories, then progress can be made. In particular, we consider the less general but very common situation of a person performing a daily repeated activity over an extended time period, and show that it is possible to automatically extract visual information related to deviations from the normal behavior of a person and/or changes in the environment [1]. This is achieved in two major steps. In the first step a complete image sequence is registered w.r.t. previously acquired sequences and novelty is measured in terms of the lack of registration caused by a strong deviation from the daily repeated activity. In the second step, images acquired from similar locations but different days are registered in order to separate new objects from non-changing background. The resulting automatically extracted images correspond very well with those extracted manually with the purpose of storing novel non-repeated events and objects encountered by the person wearing the camera.

## References

- [1] Omid Aghazadeh, Josephine Sullivan, and Stefan Carlsson. Novelty detection from an ego-centric perspective. In *CVPR*, pages 3297–3304, 2011.
- [2] Aiden R. Doherty, Niamh Caprani, Ciarán O Conaire, Vaiva Kalnikaitė, Cathal Gurrin, Alan F. Smeaton, and Noel E. O'Connor. Passively recognising human activities through lifelogging. *Computers in Human Behavior*, 27(5):1948–1958, 2011.
- [3] Zhengwei Qiu, Cathal Gurrin, Aiden R. Doherty, and Alan F. Smeaton. Automatically detecting important moments from everyday life using a mobile device. CHI 2011 Workshop on Video interaction - Making broadcasting a successful social media, 2011.