

Collaborative Personalization of Image Enhancement

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Abstract This paper presents methods for personalization of image enhancement, which could be deployed in photo editing software and also in cloud-based image sharing services. We observe that users do have different preferences for enhancing images and that there are groups of people that share similarities in preferences. Our goal is to predict enhancements for novel images belonging to a particular user based on her specific taste, to facilitate the retouching process on large image collections. To that end, we describe an enhancement framework that can learn user preferences in an individual or collaborative way. The proposed system is based on a novel interactive application that allows to collect user's enhancement preferences. We propose algorithms to predict personalized enhancements by learning a preference model from the provided information. Furthermore, the algorithm improves prediction performance as more enhancement examples are progressively added. We conducted experiments via Amazon Mechanical Turk to collect preferences from a large group of people. Results show that the proposed framework can suggest image enhancements more targeted

to individual users than commercial tools with global auto-enhancement functionalities.

Keywords Image enhancement · Personalization · Collaborative filtering · Crowdsourcing

1 Introduction

The widespread use of digital cameras now empowers many people to capture photographs of important events as well as everyday life activities. However, despite progress in hardware for high resolution images, stabilization capabilities and light-adaptive functionalities, taking good quality pictures remain a challenge for casual photographers. At times, what promised to be a very memorable picture does not look like it should. Almost every photograph could benefit from some tone and color adjustment, but tweaking adjustment parameters for every single image is impractical.

Available software for managing digital albums provide generic functionalities for one-click enhancement, such as Windows Live Photo Gallery and Picasa. While these general purpose tools make easy to improve image quality by avoiding to fine-tune enhancement controls, they do not consider any user preference. If the result of the auto/enhancement feature is unsatisfactory, the user would then have to fall back to manually refining the image appearance.

In this work, we show that people have different preferences for image enhancement. This means that when one person is allowed to enhance her photographs, she tends to adjust the final look and feel following some personal patterns and preferences. These preferences can arise due to many reasons that include personal taste, artistic expression or some other personal aspirations associated to the image. We propose to investigate methodologies that can save the effort of

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