Faces, Fashion, Forensics – Applications driving basic research in computer vision

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Abstract

I will describe how a suite of applications – face recognition, fashion recommendation and media forensics - have driven our basic research in representation learning, recognition and detection. Challenges in face recognition include detection (especially of small instances) and various normalization processes that can reduce nuisance variations or create new sources of data augmentation. I will describe SSH, a single stage headless detector and RBDN (recursively branched deep networks), two new architectures developed to address these issues. The U.S. fashion apparel industry was a $250B industry in 2015 and is expected to grow to more than $350B in 2025. A major cost in online clothing shopping is the astounding return rate – nearly 50%! This could be brought down with better recommendation and browsing systems, as well as inexpensive (cell phone supported) virtual try on tools. I will describe our research on these problems. Finally, the proliferation of sophisticated tools for image and video manipulation are having serious social and political consequences. Our research focuses on two aspects of this problem – determining if a face or person in an image is a result of a manipulation and measuring the consistency between image meta-data, image appearance and online data sources.