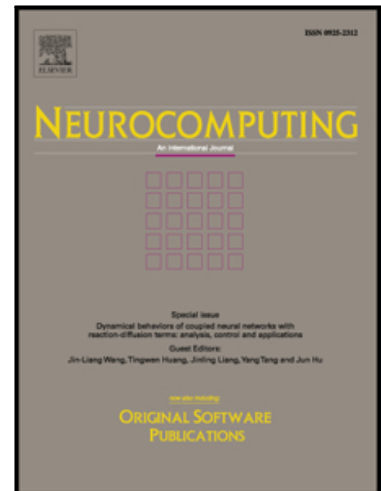


Accepted Manuscript

Robust Long-term Correlation Tracking using Convolutional Features and Detection Proposals

Bin Lin, Ying Li, Xizhe Xue, Jonathan Cheung-Wai Chan

PII: S0925-2312(18)30940-8
DOI: <https://doi.org/10.1016/j.neucom.2018.08.025>
Reference: NEUCOM 19854



To appear in: *Neurocomputing*

Received date: 29 August 2017
Revised date: 24 April 2018
Accepted date: 10 August 2018

Please cite this article as: Bin Lin, Ying Li, Xizhe Xue, Jonathan Cheung-Wai Chan, Robust Long-term Correlation Tracking using Convolutional Features and Detection Proposals, *Neurocomputing* (2018), doi: <https://doi.org/10.1016/j.neucom.2018.08.025>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Robust Long-term Correlation Tracking using Convolutional Features and Detection Proposals [☆]

Bin Lin^a, Ying Li^{a,*}, Xizhe Xue^a, Jonathan Cheung-Wai Chan^b

^a*School of Computer Science, Northwestern Polytechnical University, Xi'an 710072, PR China*

^b*Department of Electronics and Informatics, Vrije Universiteit Brussel, 1050 Brussels, Belgium*

Abstract

Correlation filter based trackers have achieved appealing performance and high efficiency in recent years. However, for long-term tracking where target objects undergo dramatic appearance variation due to heavy occlusion or out-of-view, conventional correlation filter based tracking algorithms would be distracted by irrelevant objects. Once the trained tracker loses its way, it is impossible to recover the information for the following frames as the model has drifted. In this paper, we decompose the long-term tracking task into tracking and detection. Tracker learns separate correlation filters for explicit translation and scale estimation. Specifically, in order to improve tracking accuracy, the convolutional features for translation filter are extracted, and the scale filter is learned using the target appearance sampled at different scales. Detector trains an online long-term filter and applies it to the entire frame to generate detection proposals. By exploiting these detection proposals, it helps the tracker to recover from problems such as temporary or persistent occlusions. In this way, the proposed approach could handle the model drifting problem effectively for long-term tracking with more accurate estimation of object scale and location. Extensive experimental results on large-scale benchmark sequences have shown the robustness of the proposed method.

Keywords: Long-term tracking; Correlation filter; Convolutional features; Detection proposals.

1. Introduction

Visual tracking is one of the most active research topics in computer vision. Given its initial state, the goal of tracking is to determine the bounding box of an object target in an image sequence. It plays a crucial role in numerous applications such as autonomous driving, surveillance systems, unmanned aerial vehicle

[☆]This work was supported by National Key Research and Development Program of China (Grant No. 2016YFB0502502), National Natural Science Foundation of China (Grant No. 11502057, 11661028, 61703117), Natural Science Foundation of Guangxi (Grant No. 2015GXNSFBA139005), and Basic Skills Improvement Foundation of Young Teacher in Guangxi Universities (Grant No. 2017KY0260).

*Corresponding author at: School of Computer Science, Northwestern Polytechnical University, Xi'an 710072, PR China. Tel: +86 029-88431532.

Email addresses: binlin@mail.nwpu.edu.cn (Bin Lin), lybyp@nwpu.edu.cn (Ying Li), xuexizhe@mail.nwpu.edu.cn (Xizhe Xue), jcheungw@etrovub.be (Jonathan Cheung-Wai Chan)

Download English Version:

<https://daneshyari.com/en/article/10151126>

Download Persian Version:

<https://daneshyari.com/article/10151126>

[Daneshyari.com](https://daneshyari.com)