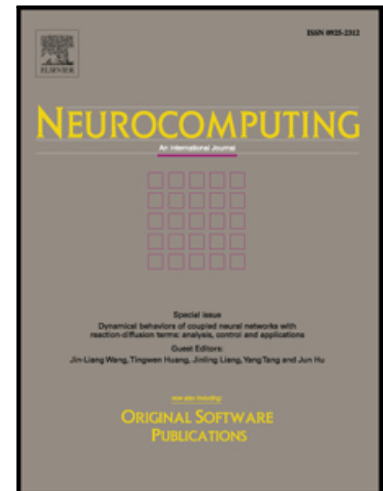


Accepted Manuscript

Multi-task, Multi-domain Learning: application to semantic segmentation and pose regression

Damien Fourure, Rémi Emonet, Elisa Fromont, Damien Muselet, Natalia Neverova, Alain Trémeau, Christian Wolf

PII: S0925-2312(17)30684-7
DOI: [10.1016/j.neucom.2017.04.014](https://doi.org/10.1016/j.neucom.2017.04.014)
Reference: NEUCOM 18347



To appear in: *Neurocomputing*

Received date: 27 July 2016
Revised date: 2 March 2017
Accepted date: 5 April 2017

Please cite this article as: Damien Fourure, Rémi Emonet, Elisa Fromont, Damien Muselet, Natalia Neverova, Alain Trémeau, Christian Wolf, Multi-task, Multi-domain Learning: application to semantic segmentation and pose regression, *Neurocomputing* (2017), doi: [10.1016/j.neucom.2017.04.014](https://doi.org/10.1016/j.neucom.2017.04.014)

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.

Multi-task, Multi-domain Learning: application to semantic segmentation and pose regression

Damien Fourure^{a,b,*}, Rémi Emonet^a, Elisa Fromont^a, Damien Muselet^a,
Natalia Neverova^b, Alain Trémeau^a, Christian Wolf^b

^a*Univ Lyon, LHC*

^b*Univ Lyon, INSA-Lyon, LIRIS, F-69621, LYON, France*

Abstract

We present an approach that leverages multiple datasets annotated for different tasks (e.g., classification with different labelsets) to improve the predictive accuracy on each individual dataset. Domain adaptation techniques can correct dataset bias but they are not applicable when the tasks differ, and they need to be complemented to handle multi-task settings. We propose a new *selective loss* function that can be integrated into deep neural networks to exploit training data coming from multiple datasets annotated for related but possibly different label sets. We show that the gradient-reversal approach for domain adaptation can be used in this setup to additionally handle domain shifts. We also propose an auto-context approach that further captures existing correlations across tasks. Thorough experiments on two types of applications (semantic segmentation and hand pose estimation) show the relevance of our approach in different contexts.

Keywords: Deep learning, Convolutional neural networks, Semantic segmentation, Domain adaptation, Multi-task learning

*Corresponding author

Email addresses: damien.fourure@univ-st-etienne.fr (Damien Fourure),
remi.emonet@univ-st-etienne.fr (Rémi Emonet), elisa.fromont@univ-st-etienne.fr
(Elisa Fromont), damien.muselet@univ-st-etienne.fr (Damien Muselet),
natalia.neverova@liris.cnrs.fr (Natalia Neverova), alain.tremeau@univ-st-etienne.fr
(Alain Trémeau), christian.wolf@liris.cnrs.fr (Christian Wolf)

Download English Version:

<https://daneshyari.com/en/article/4947375>

Download Persian Version:

<https://daneshyari.com/article/4947375>

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