Auxiliary & Adversarial Learning for Medieval Performance of Singers Recognition

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Abstract

Convolutional Neural Networks have opened the gate for human-expert level performance in Computer Vision for many different applications. However, the biggest fear when deploying such large models to the real world is their ability to handle new and different data. Domain Adaptation (DA) is a field in machine learning that tries to solve the model's dependency on the training data. One powerful approach to DA is auxiliary learning where the model is trained on the task but also on an extra task that allows stabilization of the model and reduces overfitting. Another approach that doesn't use any extra data is the Adversarial approach which leverages the unsupervised data and forces the model to extract domain-independent features.

These methods are especially important in the setting of medieval and historic manuscripts which are quite rare and often aren't very clear. In our lab SCAI-Sorbonne University , we are applying DA techniques to help build models able to recognize Singing scenery in medieval manuscripts in order to build inspiration for the reconstruction of the Notre-Dame cathedral in Paris.

Partnership: SCAI-Sorbonne University (https://scai.sorbonne-universite.fr/) and PHEND - Past Has Ears EU JPI Cultural Heritage project PHE Sorbonne University

Biography

Frédéric BILLIET is actually Professor of Medieval Music at Sorbonne University, Vice-Dean of the Faculty of Art and Humanities and co-director of the Organology/Iconography program in the Institute of Researches in Musicology (IReMUS - https://www.iremus.cnrs.fr/). His major fields of research are the medieval musical iconography and the soundscapes of the Middle Ages. He is responsible for the research program on medieval musical iconography MUSICONIS "the representation of sound in the Middle Ages" supported by the ANR and by IReMUS (http://musiconis.huma-num.fr) and the SCAI Sorbonne University (https://scai.sorbonne-universite.fr/). He is currently engaged in the PHE program (http://pasthasears.dalembert.upmc.fr/doku.php/phe) with the acousticians of Sorbonne University.

2nd Speaker Biography

Biography

Imad Eddine Ibrahim BEKKOUCH is PhD candidate at Sorbonne University, Paris, France with the Sorbonne Center for Artificial Intelligence working on Knowledge Graphs and Computer Vision models for Medieval Manuscript Recognition. He received his B.S. degree in Computer science from Abdelhamid Mehri Constantine 2 University, Algeria in 2018. He has completed his M.Sc. in data science at Innopolis University. His research interests are domain adaptation, computer vision, and deep learning.