WB - Kamień milowy 1b

Malwina Wojewoda, Szymon Rećko, Mateusz Sperkowski
Warsaw University of Technology

Abstract

1 Related Works

Along with the constant rise of computing power, came the growth of deep learning architectures. They went from being theoretical academic fields of study to a widely used tool with ever better results [13]. In recent years, we've seen rising trends of applications and research in the cross-section of machine learning and medicine fields [4], [7]. Such systems could help alleviate strained healthcare systems, assists doctors, or even discover new drugs [14], [11], but most importantly to detect diseases early [10]. Focusing on the field of ophthalmology, some of the tasks for deep learning models could be disease classification, segmentation of anatomical parts of an eye and prediction on post surgery complications. There are observed various approaches to these tasks: from convolutional neural network and deep belief network in case of disease classification [1], to modeling the task as a regression problem speaking of prediction on post surgery complications [6]. If the goal can be divided into separate parts, in a standard approach, for each of such tasks a new architecture would be applied, but a Multi Task Learning approach proposes improvement in encoding of the data and faster inference time, by sharing the model parameters and data [2], [12]. Another approach to tighten the deep learning model is knowledge distillation, which attempts to teach a smaller student model on the outcomes of a bigger teacher model [5]. Successful usage and a different approach from the standard distillation for liver CT scan segmentation is shown in [15]. Recent works propose joining of knowledge distillation and multitask learning, in general usage datasets [8], [9] and medical ones, especially in fundus images analysis [3].

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