

TITLE: Deep Learning in Optical Character Recognition and Medical Imaging - Examples and Methods

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ABSTRACT: In this follow-up talk I will present examples of and outline approaches to solving the underlying problems.

One example from Optical Character Recognition (OCR) is baseline detection for English and Arabic, using Hough transform. A "baseline" is a term from typography and refers to the line on which bottoms of characters are aligned, and its detection is of crucial importance in OCR.

The second example is that of character recognition using a neural network. I will frame this example as a classification problem, which is one of the two main general problems in machine learning (the other problem is regression). The mathematical context of classification will be presented. The detailed example will include creating a training dataset of ~1000 characters from English text originally stored on microfilm, followed by building a neural network to recognize the characters. The use of validation and testing data will be illustrated to check network performance on data not seen during training.

It is impossible to practice machine learning without the machine. Therefore, I will conduct a live demonstration using MATLAB, giving the audience a glimpse of this aspect of research.