Development of a Unified Deep Learning Platform for Teaching Image-related Courses

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Abstract:

Recently deep learning models are gaining increasing popularity today. On one hand, deep learning models have been consistently envisioned as the new generation of image based analysis and achieved good performance in many applications, such as image recognition and automatic medical image diagnosis. On the other hand, the training process of deep learning is tedious and time-consuming if the computer is not equipped with Graphics Processing Unit (GPU). Different configurations will lead to different experiment results and may even yield errors of codes due to different coding versions.

In order to help cultivate students of the latest techniques, we propose a standardized deep learning platform for the university course (EE4206 (digital image processing)) to deliver knowledge on both theoretical model learning as well as hands-on applications in automatic image analysis. This platform utilize the cloud-based system with GPU to provide student the opportunities to learn deep learning models with unified program environment and powerful computation capability. A visualized module will be developed and integrated into the proposed platform to enhance the model learning and interactions among students. Moreover, practical medical image applications with deep learning models will be introduced to improve hands-on project experience. This proposed project will help students to acquire basic deep learning skills, develop critical thinking and integrate the skills in applications relevant to medical image analysis.