Home Work (3) - Deep Learning

Teddy Lazebnik

1.4.2020

1 Submission

You must submit your Homework until the 23.4.2020, 23:59 pm [Israel time]. Include your full name and ID number (in the email title and body). A work without full name and ID number won't be excepted. You must submit your home work with all the questions answered. The submission is done by email. Please submit your work as a single PDF file (with the texts, graphs, and calculation plots) and all the code files. The email address is: lazebnik.teddy@gmail.com. In case of reserve or illness, please send me an email in advance.

2 Home Work

- (1) implement in Python (you can use Keras or TensorFlow) a CNN model which classify (triangle, circle, square, rectangle) from a binary image. You can use the data set generated from my website, the course page, the blue button saying "Go to random shapes dataset page".

  Show the epoch X loss graph and any other graph you find important.

- (2) Repeat task (1) but this time add salt-paper noise with probability p=0.01, p=0.05, p=0.1, p=0.25, and p=0.5. Analyze the difference in the results. Changes your code to best fit the p=0.5 caes.

- (3) implement in Python (you can use Keras or TensorFlow) a CNN model which classify poses of an image. Define five or more (5+) different classes of poses. You can use the data set generated from my website, the course page, the blue button saying "Go to random poses dataset page".

  Show the epoch X loss graph and any other graph you find important.

- (4) Repeat task (3) but this time use FNN. HINT: convert the poses image to some higher-level features using pre-processing of the image and / or meta-data.

- (5) Find a CNN (DL) model presented in an academic paper (between 2018 and today) and summarize the academic paper. Make sure to include the

following subjects: the takes in hand, the train and test data set source, the NN architecture, and results. The summery need to be between 400 and 800 words in English.

- (6) Write a document (In Hebrew, English or Russian) which presents the differences between CPU, GPU, and TPU in the context of DL computing. Make sure to reference to your sources. The summery need to be more then 300 words.