Kvitteringsmail vedr. projektindberetning

1 meddelelse

DTU Inside Projektindberetning <inside-noreply@dtu.dk>   19. juli 2022 kl. 06.02
Send svar til: no-reply@dtu.dk
Til: s194119@student.dtu.dk

Der er indgået en aftale omkring et Bachelorprojekt mellem dig og Institut for Matematik og Computer Science. Detaljerne i aftalen fremgår af nedenstående:

Informationer om projekt af typen Bachelorprojekt:

Dansk titel: EyeFormer: Indlæring af objektafgrænsninger fra Eye-Tracking data ved brug af Vision Transformer-metoden
Engelsk titel: EyeFormer: Learning to Detect Objects from Eye-Tracking Data using a Vision Transformer
Forklaring/indhold(DK):   (Ikke udfyldt)
Forklaring/indhold(UK):   Object class detection is the task of predicting a bounding-box around each instance of an object class in a test image. Traditionally, training an object class detector requires a large set of images in which objects are manually annotated with bounding-boxes [3, 6, 10, 5]. Bounding-box annotation is time consuming and expensive [9, 8]. The authors of [11] report a 26s median time to draw a bounding-box during a large-scale annotation effort for ImageNet by crowd-sourcing on Mechanical Turk. Annotating large sets of images is therefore an enormous undertaking, which is typically supported by crowdsourcing [3, 1, 4].

In this project, we will revisit the idea of using a "hands-free" way to annotate objects in images and training object detectors using eye-tracking data [7]. Instead of carefully marking every training image with accurate bounding-boxes, the annotators only need to find the target object in the image, look at it, and press a button. By tracking the eye movements of the annotators while they perform this task, we obtain valuable information about the position and size of the target object. Unlike bounding-box annotation, the eye tracking task requires no annotation guidelines and can be carried out by completely naive viewers. Furthermore, the task can be performed in a fraction of the time it takes to draw a bounding-box (about one second per image).

The goal of this project is to build upon the idea of [7] and build a transformer-based deep learning model that can infer the location of a target object (i.e., bounding box) given the eye fixations on the image. Given the recent success of the attention mechanism and the text transformers [12] in the computer vision community for various image recognition tasks using Vision Transformers [2], we will propose a vision and eye-tracking Transformer that can learn to predict the location of the target object given only human eye fixations on the images.

References
[1] Imagenet large scale visual recognition challenge (ILSVRC). http://www.image-net.org/challenges/LSVRC/2014/index, 2014.
[2] Alexey Dosovitskiy, Lucas Beyer, Alexander Kolesnikov, Dirk Weissenborn, Xiaohua Zhai, ThomasUnterthiner, Mostafa Dehghani, Matthias Minderer, Georg Heigold, Sylvain Gelly, et al. An image is worth 16x16 words: Transformers for image recognition at scale. arXiv preprint arXiv:2010.11929, 2020.
[3] M. Everingham, S. Eslami, L. van Gool, C. Williams, J. Winn, and A. Zisserman. The PASCAL visual object classes challenge: A retrospective. 2015.
[4] M. Everingham, L. Van Gool, C. K. I. Williams, J. Winn, and A. Zisserman. The PASCAL Visual Object Classes Challenge 2012 (VOC2012) Results. http://www.pascal- network.org/challenges/VOC/voc2012/workshop/index.html, 2012.
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[6] Kaiming He, Georgia Gkioxari, Piotr Doll´ar, and Ross Girshick. Mask R-CNN. pages 2980-2988, 2017.
[7] Dim P. Papadopoulos, Alasdair D. F. Clarke, Frank Keller, and Vittorio Ferrari. Training object class detectors from eye tracking data. In ECCV, 2014.
[8] Dim P Papadopoulos, Jasper RR Uijlings, Frank Keller, and Vittorio Ferrari. Training object class detectors with click supervision. 2017.
[9] Dim P. Papadopoulos, Jasper R. R. Uijlings, Frank Keller, and Vittorio Ferrari. We don't need no bounding-boxes: Training object class detectors using only human verification. 2016.
[10] S. Ren, K. He, R. Girshick, and J. Sun. Faster R-CNN: Towards real-time object detection with region proposal networks. 2015.
[11] H. Su, J. Deng, and L. Fei-Fei. Crowdsourcing annotations for visual object detection. In AAAI Human Computation Workshop, 2012.

[12] Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N Gomez, Lukasz Kaiser, and Illia Polosukhin. Attention is all you need. In NeurIPS, 2017.

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ECTS Point:                15
Projektplan deadline:       01-10-2022
Startdato:              01-09-2022
Afslutningsdato:            24-11-2022
Samarbejdsinstitutter:      Intet samarbejdsinstitut
Projekt udføres i:         Danmark
Antal måneder i udlandet:     (Ikke udfyldt)
Vejleder(e):             Dimitrios Papadopoulos (dimp@dtu.dk)
Vejleder (ekstern):          (ingen eksterne vejledere på projektet)

Studerende:             194119(Martin Maximilian Ægidius)
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For English version, please see below

Kære studerende (og vejleder)

Godkendelse
Dit bachelorprojekt er nu registreret og kan ses inden for 24 timer i din Studieplanlæger såvel som i din karakteroversigt, vælg visningen "Alle resultater".
Det er vigtigt, at du sikrer, at den danske og engelske titel er korrekt, da titlen vil fremgå af dit endelige eksamensbevis. Ved evt. fejl skal projektet opdateres via din projektvejleder med den ønskede ændring.
Denne godkendelse er kun administrativ. Hvis der er faglige indsigelser vil du og din vejleder blive kontaktet af din studieleder inden for de næste 14 dage. Hvis ikke du hører noget inden da, er din projektregistrering endelig godkendt
Karakterfrist
Karakteren for bachelorprojektet gives ved den mundtlige eksamination, som skal afholdes senest 10 arbejdsdage efter afleveringsdatoen for projektrapporten.

Du vil modtage dit eksamensbevis med posten ca. 8 uger efter, at vi har modtaget den sidste karakter, dog senere hvis du har modtaget din karakter op til sommerferien.

Med venlig hilsen
Studieadministrationen

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Dear Student (and Supervisor),

Approval
Your bachelor project has been registered and will appear in your Study Planner as well on your transcript (the file "All results") within 24 hours.
It is important that you make sure that the Danish and English titles are correct, since these will appear on your diploma. If there is a mistake, please have your supervisor send an update with the corrections.
This approval is administrative only. Should there be any objections to the academic content, your head of studies will notify you and your supervisor within the next two weeks. Should you not be notified within two weeks, the approval is final.

Grading Deadline
The bachelor project is graded after the oral defense which must be held no later than 10 work days after submission of the written report.

Your diploma will be sent to you by mail approximately eight weeks after we have received your last grade (later, however, if you have received your last grade just before the Summer holiday).

Best regards,
Study Administration