PhD Project
Deep Learning for Personalised Remarketing
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The project is aimed to develop new methods to manipulate and generate images and videos for personalised remarketing using deep learning technologies. Realistic image and video contents will be automatically generated from a user's online profile (preferences, browsing history, shared pictures etc.) by embedding compatible items (e.g. clothes, hats, sunglasses etc) to the original pictures or videos of the user.

Project Description

The project is aimed to investigate and develop new methods to manipulate and generate images and videos for personalised remarketing. Realistic image and video contents will be automatically generated from a user's online profile (preferences, browsing history, shared pictures etc.) by embedding compatible items (e.g. clothes, hats, sunglasses etc) to the original pictures or videos of the user.

This is an example of how the system works. From a simple picture of a user, new images will be automatically generate with "add-on" promotional items (e.g. clothes) specifically for the user only. Also different poses, gestures or background fitting to the user's geolocation and temporal context will be incorporated into the process.

The key methods and algorithms of the project include semantic segmentation from an input image, items (e.g. clothes) prototyping, person detection and pose estimation, effective training of Generative Adversarial Networks (GANs).

Project Impacts

The underlying research of the project will directly benefit the fashion and clothing industry, both for online and high street. It will potentially improve consumers' shopping experience, increase satisfaction rate, reduce the costs of business (e.g. large number of returns), and better feedback for product design. We will work closely with our industrial partners to explore further opportunities of collaborated research, application development and commercialisation of the research outcomes.

Environment and Support

The Department of Computer Science enjoys a strong international standing for its research in both data science and artificial intelligence, as evidenced by numerous research performance metrics, e.g., 3rd in UK overall and 1st in UK for H-index from 2018-2020 (the NTU Performance Ranking of Scientific Papers, Subject: Computer Science, 2020). Data Science and artificial Intelligence has been a strategic focus of the Department for both research and teaching. The proposed research aligns well with the themes of both Data Science and Artificial Intelligence, and is focused on the active and promising topics of Generative Adversarial Networks in Deep Learning, and Object Recognition and Action Recognition.

Eligibility

Applicants will be required to demonstrate that they have the following qualification, knowledge and skills:

- An Undergraduate First Class or Upper-Second Honours degree in computing, engineering, or other STEM subjects.
- A Postgraduate degree is not required but may be an advantage.
- Strong programming skills, ideally in Python, but other languages also acceptable.
- Good knowledge in machine learning, deep learning and artificial intelligence.
- Knowledge of deep learning models such as Convolutional Neural Networks, Recurrent Neural Networks and Generative Models may be an advantage.
- Highly motivated to learn.
- Able to work independently as well as collaborating with others in a team.