IDP Project / Student Assistant

Using deep learning in the automated analysis of architectural images

A picture can say a thousand words, but what do thousands of pictures say?

Image matters for cities. Urban players count on the media effects associated with the circulation of photographs. However, how can we use metadata of photographs circulated on social media platforms to quantify and assess these effects? Looking forward deep convolutional neural networks (CNN) will play a key role. Our pilot study of the photographs of four architectural projects in Europe (using Flickr platform) concluded that more research is needed to assess the content of these photographs. What are these photographs about? Are they photographs of the architecture within an urban context? Do the photographs focus on specific elements of the architecture? Are they taken from inside these buildings?

The task of the informatics and/or data science student is to develop an automated method that can analyze big data of photographs of selected architecture projects uploaded on selected photo-sharing platforms. The tasks include:

- Establish what existing tools can be used for the purposes.
- Adaptation of existing tool or development of automated tool for both extraction of relevant data from data-pool by images and text
- Extracting images by algorithmic analysis of text (including hashtags, GPS coordinates, and image/forms, keywords
- Pre-training of CNN model using selected images of case studies by using cropped object patches to ensure visual identification.
- Application of CNN model to identify photographs relevant for each case study (or unique list of buildings)
- Allocate a confidence / accuracy rating score to the data extracted (if necessary)
- Deployment of automated tool across selected photo-sharing platforms to build a catalogue / lexicon to facilitate further sentiment analysis
- Categorize or classify images in resultant software library.

Previous studies in deep convolution neural networks is necessary, but knowledge of architecture is not required.

Work can be done remotely. Intermittent meetings will be held at the chair, located in TUM Munich city campus Arcisstraße 21, Munich.

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Photographs on first page in Google on “Guggenheim museum Bilbao”