Akif Berber
Lisa Goerke
Arianne van de Griend
Germonda Mooij
Ralitsa Spasova
Kai Standvoß

Advanced Research Methods — Research Proposal

Do human prototypicality ratings correlate with neural network categorization?

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1 Methods description

We use a pretrained neural network architecture called VGG16 which is trained on Imagenet. From the 1000 learned categories we select 10. We then use the network to classify images of those categories retrieved from Flickr. The network will output a probability for the classification of each category. 10 images per category are chosen evenly distributed over the output probabilities. These images will be presented to human participants. They are asked to classify the images and rate them according to their prototypicality.

In the analysis both the prototypicality rating and classification reaction time is compared to the neural networks classification probability. As a baseline, we perform pixel based clustering on the images.

2 Available materials

Images from Flickr are downloaded. The neural network architecture VGG16 is used. Participants are chosen among course participants. For the experiment, Google forms is used.

3 Tasks, date and responsible persons

Task	Date	Actual date	Responsible persons
Finalize research plan	12/09/2016	12/09/2016	Group
Literature research			All
Select categorisations for images	12/09/2016	26/09/2016	Group
Gathering images from Flickr	03/10/2016	03/10/2016	Kai
Run images through neural network	10/10/2016	03/10/2016	Kai
Analyze results of NN	10/10/2016	03/10/2016	Group
Pick 10 images/category from NN distribution	03/10/2016	10/10/2016	Group
Design experiment	10/10/2016	03/10/2016	Group
Implement experiment	17/10/2016	11/10/2016	Lisa
Pilot study	17/10/2016	13/10/2016	Ralitsa
Possible redesign	17/10/2016	17/10/2016	Group
Actual study	24/10/2016		Group
Clustering on images and/or statistical classification	31/10/2016		Arianne
Analysis	31/10/2016		Germonda
Preparing presentation	07/11/2016		Group
Writing report	14/11/2016		Group