1. Introduction

Motivation
To help Web users to better manage self-representation
Why Profile images?
- Important avenue to share self-representation
- Have a big effect on how friends and strangers judge us
- Normally are public by default

Why Intelligence?
- Related to important life outcomes, e.g., income, relationships
- First impressions of intelligence can have significant consequences in social scenarios, e.g., employment
- High intelligence is a trait that people want to project to others by self-stereotyping

Research questions
1. Can humans make intelligence judgments for others from profile images?
2. Can computers make such judgments?
3. What visual elements an intelligent person will use?
4. What visual elements make a person perceived to be intelligent?

2. Method

2.1 Data collection
myPersonality database (mypersonality.org)
- 1,122 users took an IQ test and provided FB profile images
  - 51% men, age mean ± std = 25.9 ± 9.2, range: 14-69
  - MI score mean ± std = 112.4 ± 14.5, range: 64.9-138.6
- 739 human raters rated the 1,122 images
  - 49% men, age mean ± std = 24.2 ± 6.2, range: 15-72
  - Each rater was randomly shown 50 or 100 images
  - Each image was finally rated by at least 24 raters
- PI score of each image (user): median value of rated scores
- Profile images:
  - Normally of size 200 × 200 pixels
  - 16% non-person images (e.g., cartoons, drawings, animals, signs, etc.)
  - 60% with only one person
  - 21% with two or three persons
  - 3% group images (more than four persons)

2.2 Feature extraction
- Correlation for female users are lower than that for male users
- Most raters agree with one another in their perception of each image’s intelligence

2.3 Feature selection
- Dimension reduction: PCA
- Filter based feature selection: univariate statistical test on features and target variable (MI or PI) in training set and select features according to p-value

2.4 Intelligence estimation
- Using SVR for regression: input: visual features, output: MI or PI scores
- Leave-one-out cross-validation

3. Results

Q1: Can humans make intelligence judgments for others from profile images?
- Inter-rater reliability: 0.86
  (0.6-0.89: fair; 0.8-0.94: good; 0.95-1: excellent)
- Raters’ PI scores are relatively consistent within images but there are differences between images

Q2: Can computers make such judgments?
- Intelligence estimation from images is a difficult task even for humans, but it is possible to use algorithms to estimate it beyond a random guess

Q3: What visual elements an intelligent person will use?
- High MI & high PI
  - Do not like to use the colour pink, purple or red, and images are usually less diversified in colour, more clear in texture, and contain less skin area
  - High MI: Like to use the colour green, and have fewer faces, but this does not affect how others judge them

Q4: What visual elements make a person perceived to be intelligent?
- Inaccurate stereotypes-correlated with PI but not MI: More grey and white, but less brown and green, with higher chromatic purity, smiling and wearing glasses, and faces at a proper distance from the camera, make people look intelligent no matter how smart they really are

Possible applications
Automatic profile picture rating system

Contact
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