Investigating the Stability of the Biometric Menagerie
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Motivation
The Biometric Menagerie classifies subjects based on their matching tendencies. By identifying the subjects that are consistently difficult to match against, recognition algorithms can be tuned to handle these difficult subjects. We are interested in investigating whether a subject that is difficult to match receives the same class label across a series of covariate values.

Biometric Menagerie
- Classify subjects as likely to match themselves or imitate others
- Doddington: Genuine OR impostor match distributions
- Yager & Dunstone: Genuine AND impostor match distributions

Classification and relationship of Doddington’s Zoo and Yager & Dunstone’s additions to the Biometric Menagerie.

Experiments
- Does a subject receive the same class label under both covariate values?
- Where do subjects move within the score distribution?
- Do randomly sampled images for fixed subjects result in the same class labeling?

Results

<table>
<thead>
<tr>
<th></th>
<th>Doddington Classification</th>
<th>Yager &amp; Dunstone Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Same</td>
<td>Avg.</td>
</tr>
<tr>
<td>Illum.</td>
<td>86.3%</td>
<td>37.7%</td>
</tr>
<tr>
<td>Expr.</td>
<td>92.3%</td>
<td>52.8%</td>
</tr>
<tr>
<td>All</td>
<td>89.8%</td>
<td>45.2%</td>
</tr>
</tbody>
</table>

Data
- FRGC 2.0 Dataset
- 24,042 images of 466 subjects
- Subsets split on Gender, Expression, and Illumination

Future Work
- Does score normalization increase class label agreement across covariate changes?
  - Apply Z-Norm & F-Norm
  - Propose Subject-Sensitive F-Norm

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