1a_generate_mean_faces

February 6, 2020

1 Analyze mean faces per subgroup of the Balance Faces in the Wild (BFW) dataset.

Path to the images, with images stored per BFW convention, is expected.

1.1 Add project code to PYTHONPATH, if not already there

Check that *path_package* is set to *code* directory on respective system

[1]:
```
import pathlib
path_package=f'../'
import sys
if path_package not in sys.path:
    sys.path.append(path_package)
```

[22]:
```
import warnings
import glob
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
from pathlib import Path
from tqdm import tqdm
from facebias.image import read, write, resize

%matplotlib inline
```

[ ]:
```
font = {'font.family': 'serif',
        'font.serif' : 'Times New Roman',
        'font.color':  'darkred',
        'font.weight': 'normal',
        'font.size': 16,
        }
sns.set(style="white", rc={"axes.facecolor": (0, 0, 0, 0)})
sns.set_style('whitegrid', font)
```

1.2 Get image paths and load

Read in the data as a pandas.DataFrame and show the first few rows.

[49]:
```
dir_images = '../../data/bfw-data/bfw/bfw-cropped-aligned'
dir_subgroups = Path(f"{dir_images}").glob('*males')
dir_subgroups=list(dir_subgroups)
dir_subgroups.sort()
```

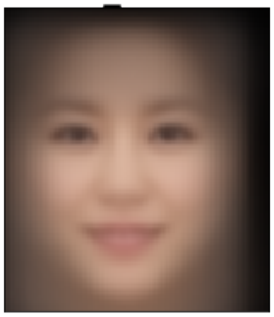
2 Compute and Display Mean Faces

[68]:
```
fig, axs = plt.subplots(4, 2, figsize=(18, 12))
mean_images = []
for dir_subgroup, ax in tqdm(zip(dir_subgroups, axs.flatten())):
    images = np.array([resize(read(f_image), 124, 108) for f_image in␣
 ↪Path(dir_subgroup).glob("*/*.jpg")])
    mean_face = np.array(images).mean(0)
    ax.imshow(mean_face)
    ax.set_xticks([])
    ax.set_yticks([])
    ax.set_title(str(dir_subgroup).split('/')[-1], fontsize=20)

    mean_images.append(mean_face)
plt.tight_layout()
```

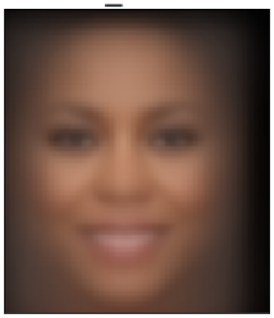
```
0it [00:00, ?it/s]
1it [00:10, 10.97s/it]
2it [00:23, 11.34s/it]
3it [00:35, 11.53s/it]
4it [00:45, 11.08s/it]
5it [00:55, 10.73s/it]
6it [01:04, 10.47s/it]
7it [01:14, 10.33s/it]
8it [01:25, 10.63s/it]
```

asian_females

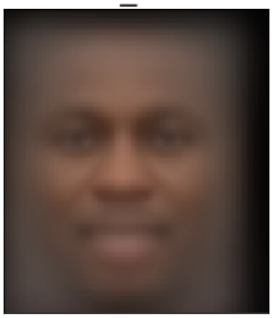


asian_males

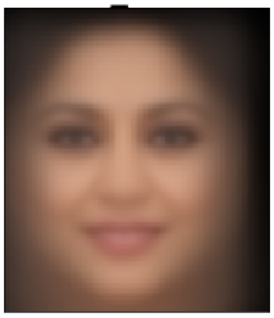
black_females



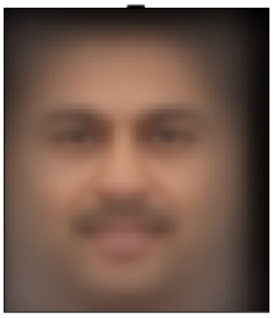
black_males



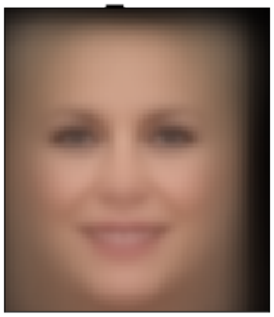
indian_females



indian_males



white_females



white_males