intersections

June 18, 2024

```
[ ]: import sys
sys.path.insert(0, '..')
import pymatcal
import numpy as np
import matplotlib.pyplot as plt
import matplotlib as mpl
```

1 Calculate AB pairs. There should be $N_A N_B$ pairs

1.1 Generate random sets of points A and points B

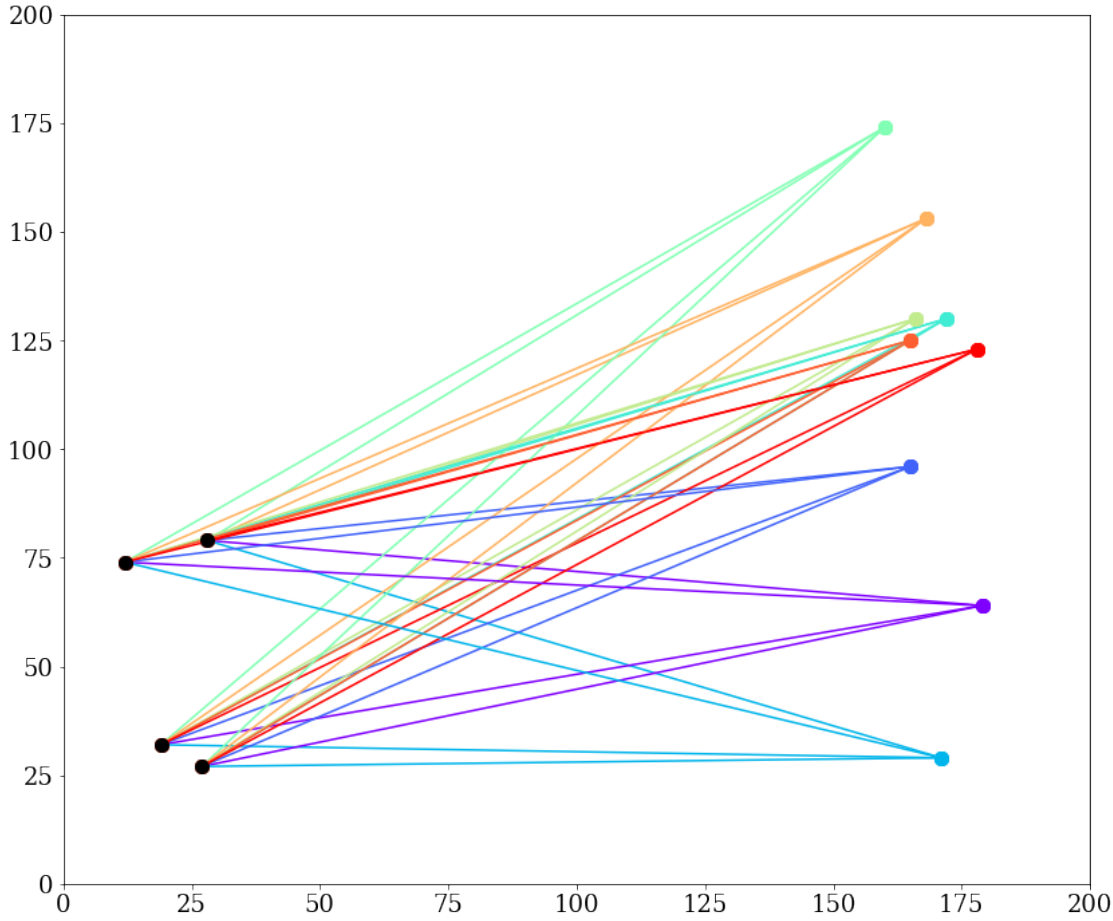
```
[ ]: rng = np.random.default_rng()
na=4
nb=9
pAs= rng.integers(low=(10,10), high=(30,180), size=(na,2))
pBs= rng.integers(low=(160,10), high=(180,180), size=(nb,2))
```

1.2 Calculate pair AB using the function defined in the module `pymatcal`

```
[ ]: abpairs=pymatcal.get_AB_pairs(pAs,pBs)
```

The plot should show a line for every pair of AB, totaly 36 lines conneting points A and points B

```
[ ]: plt.rcParams["font.family"] = "serif"
plt.rcParams["font.size"] = 18
fig, ax = plt.subplots(figsize=(12, 10))
color = plt.cm.rainbow(np.linspace(0, 1, nb))
idx = 0
for pair in abpairs:
    ax.plot(pair[0::2], pair[1::2], 'o-',c=color[idx % 9],ms=10)
    idx += 1
# axs[1].scatter(pAs[:, 0], pAs[:, 1], s=100, c="k")
ax.plot(pAs[:, 0], pAs[:, 1], 'o',ms=10, c="k")
# ax.set_aspect('equal')
ax.set_xlim(0,200)
ax.set_ylim(0,200)
fig.tight_layout()
```


200
175
150
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