

Notebook 07_occupancy.ipynb

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June 28, 2024

This notebook parse the result of 07_occupancy.py plots figures S1

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[1]: import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import scaffold.meanfield.analytical
from scaffold import labels

[2]: data = pd.read_csv("output/occupancy.csv", index_col=0)
mean = data.groupby(['R', 'p']).mean()
std = data.groupby(['R', 'p']).std()
count = data.groupby(['R', 'p']).count()
count.columns = [x+'_count' for x in count.columns]
stats = pd.merge(mean, std, suffixes=['_mean', '_std'], left_index=True,
    ↳right_index=True)
stats = pd.merge(stats, count, left_index=True, right_index=True)

[3]: fig, ax = plt.subplots(1,1, figsize=(8,5))
pspan = np.linspace(0,1,200)

for R, df in stats.groupby('R'):
    df = df.reset_index()
    l = ax.plot(pspan,
        [scaffold.meanfield.analytical.occupancy(p,R,D=100,d=1) for p in
    ↳pspan],
        label=f'R = {R}')
    ax.errorbar(df.p, df.occupancy_mean, yerr=df.occupancy_std, fmt='.',
    ↳color=l[0].get_color())

ax.legend(title=f"line: analytical result\npoints: average of {stats.
    ↳occupancy_count.min()} simulations\nerror bar: standard deviations.")
ax.set(xlabel=labels['theta'], ylabel=labels['occupancy'])
fig.savefig("fig/supfig/s1_occupancy_sto.svg")
fig.savefig("fig/supfig/s1_occupancy_sto.pdf")
stats.to_csv('source_data/s1_occupancy_sto.csv')
```

