THE FALLACY OF MERITOCRACY

PyCon Balkan

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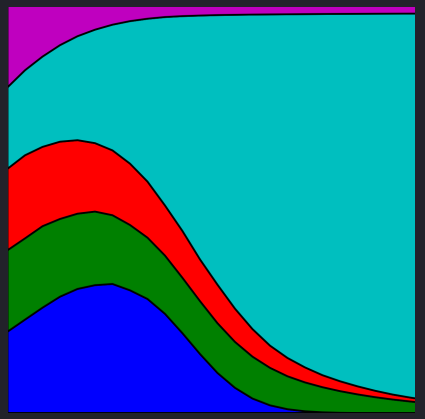
CARDIFF
UNIVERSITY
PRIFYSGOL
CAERDYDD

django
girls

Software
Sustainability
Institute

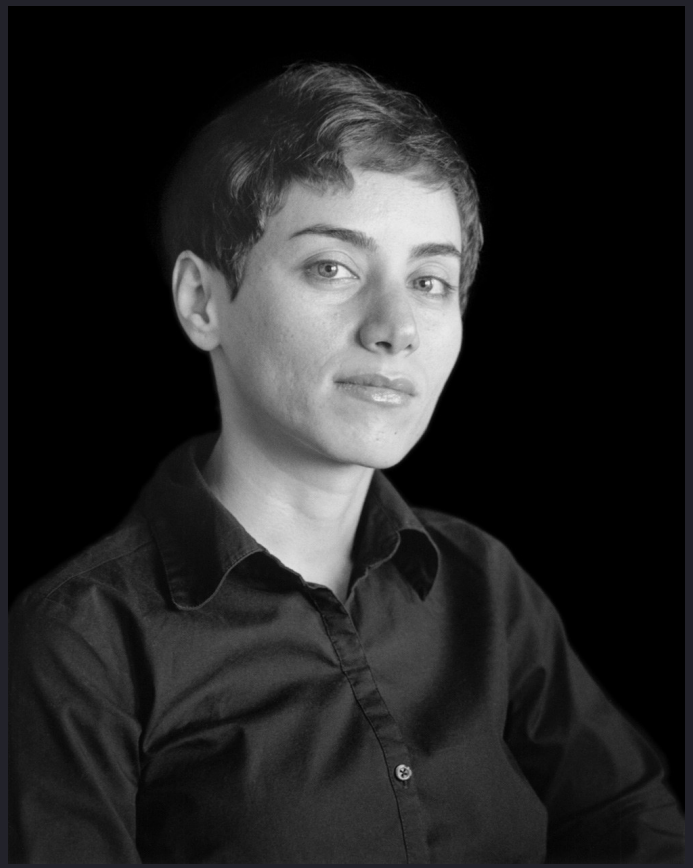
PLOS
Channels



MERITOCRACY [mer-i-tok-ruh-see]

[noun]

1. government or the holding of power by people selected according to merit.



www.newyorker.com/tech/annals-of-technology/maryam-mirzakhanis-pioneering-mathematical-legacy

en.wikipedia.org/wiki/List_of_black_Academy_Award_winners_and_nominees
www.eonline.com/news/836150/

EQUALITY VS EQUITY

EQUALITY [ih-kwol-i-tee]

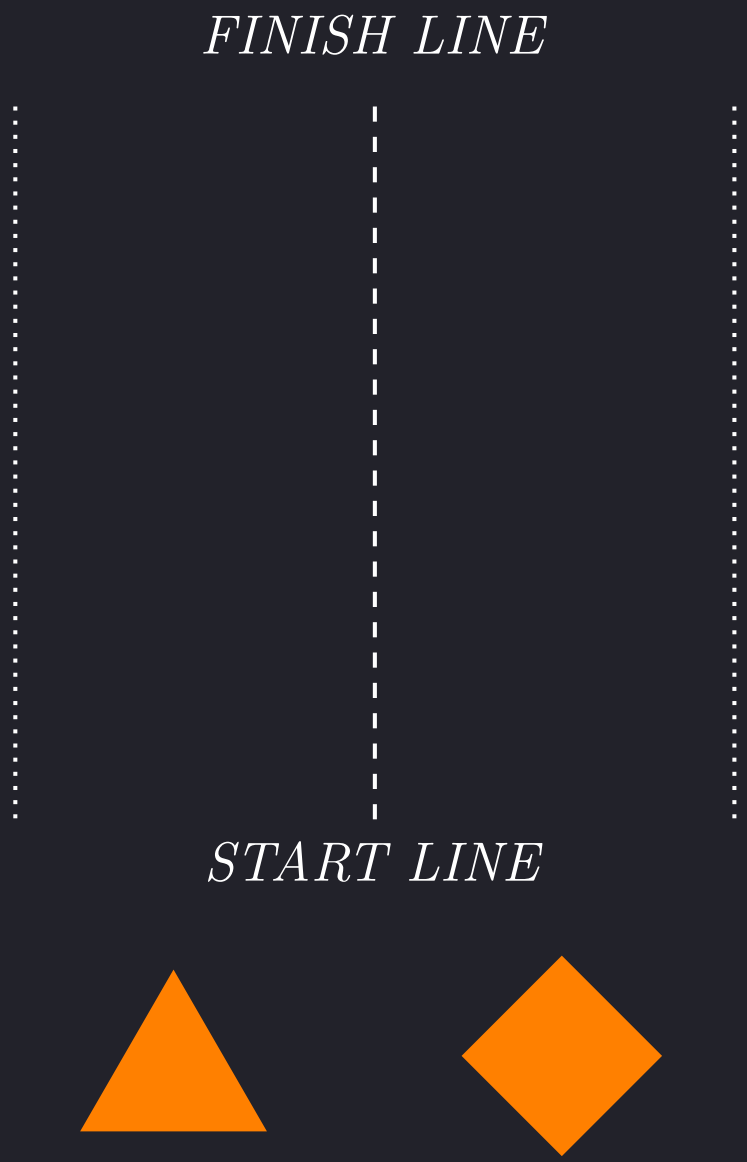
[noun]

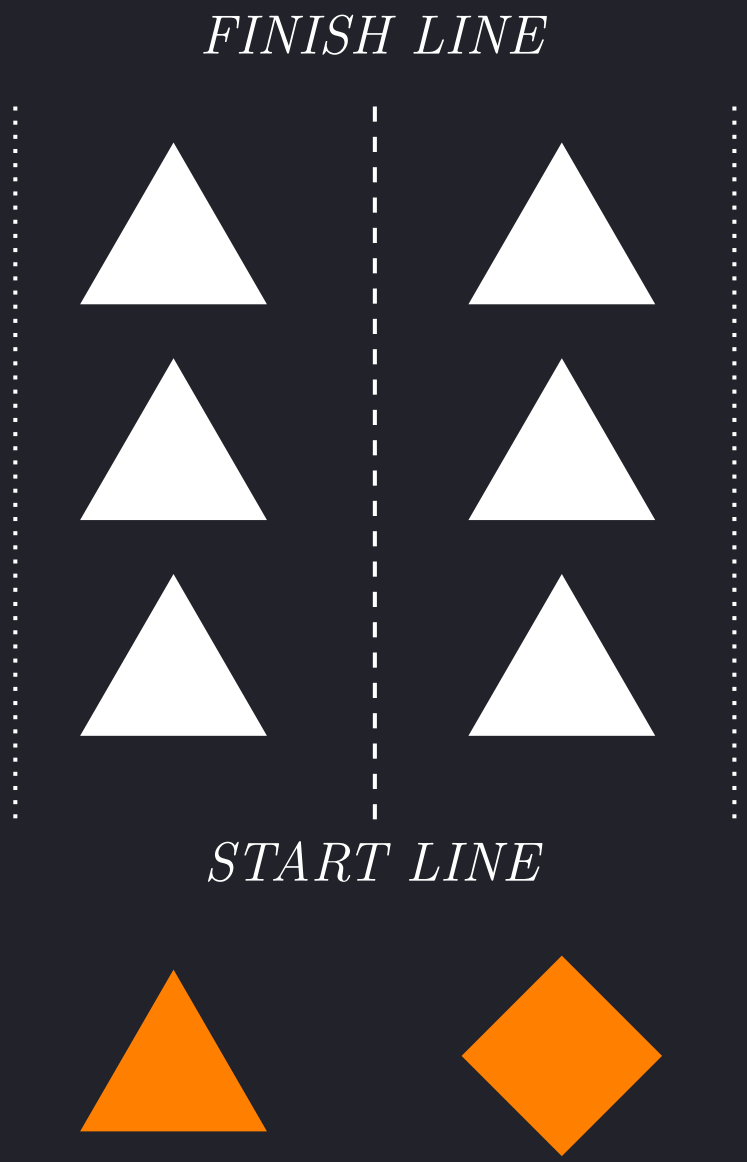
1. the state of being equal, especially in status, or opportunities.

EQUITY [ek-wi-tee]

[noun]

1. the quality of being fair and impartial.


FINISH LINE
START LINE


FINISH LINE
START LINE

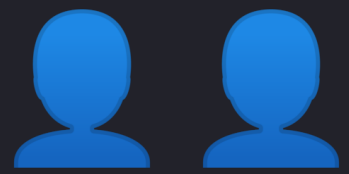
BIAS [bahy-uhs]

[noun]

1. a particular tendency, trend, inclination, feeling, or opinion, especially one that is preconceived or unreasoned.

UNCONSCIOUS BIAS

AFFINITY BIAS

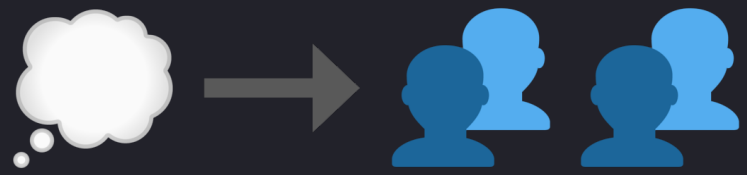


HALO EFFECT

HORNS EFFECT

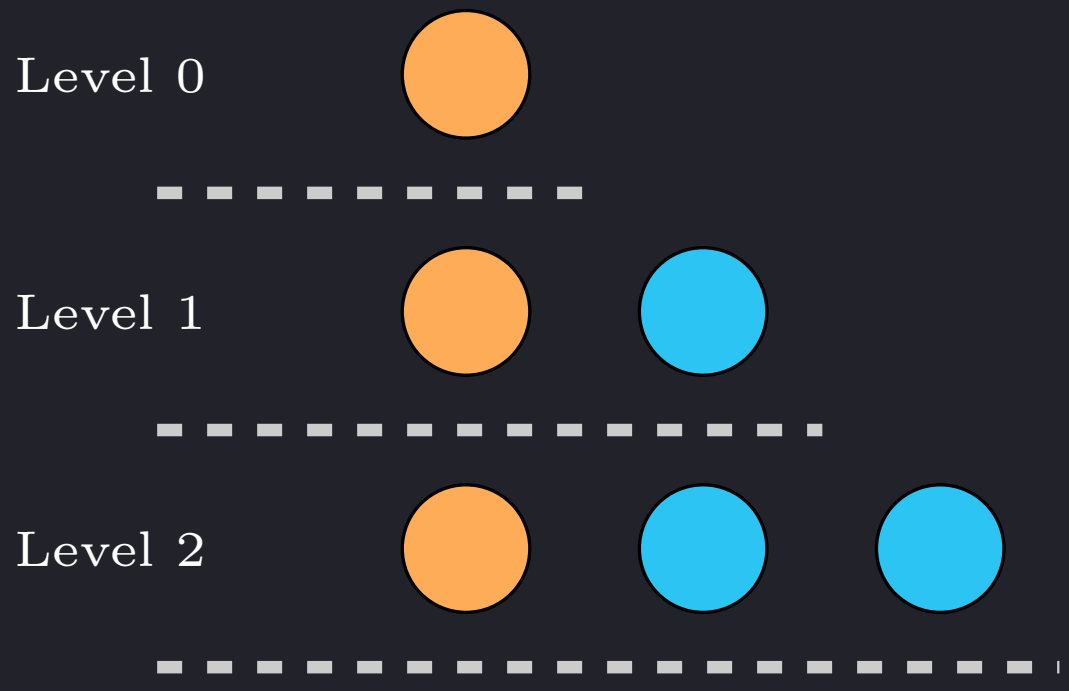
ATTRIBUTION BIAS

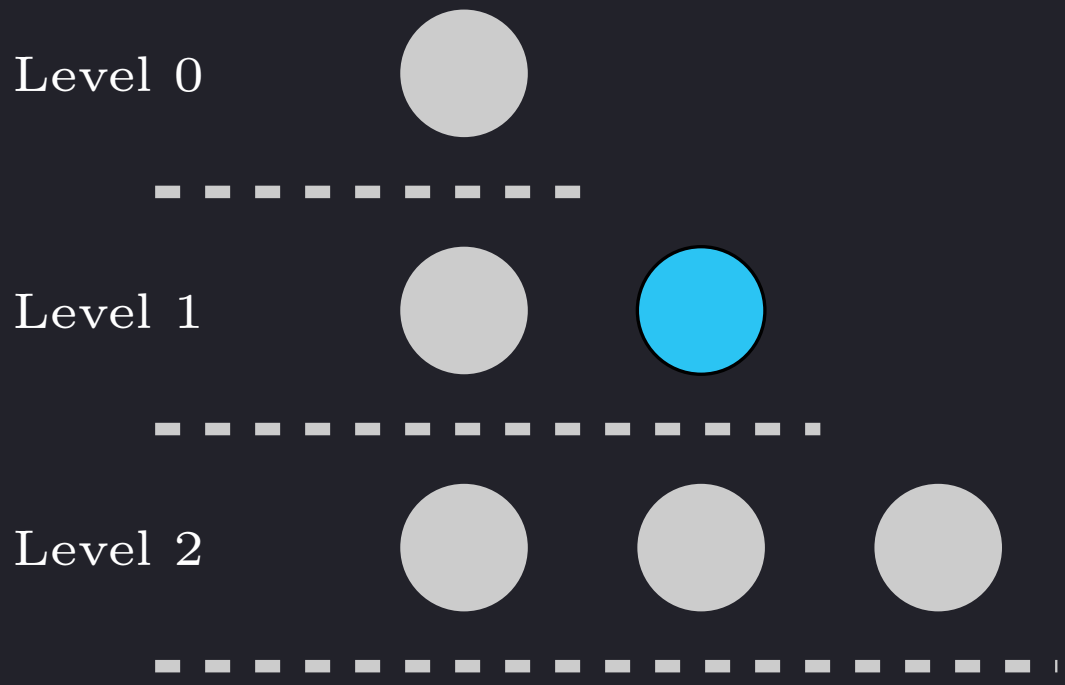
CONFORMITY BIAS



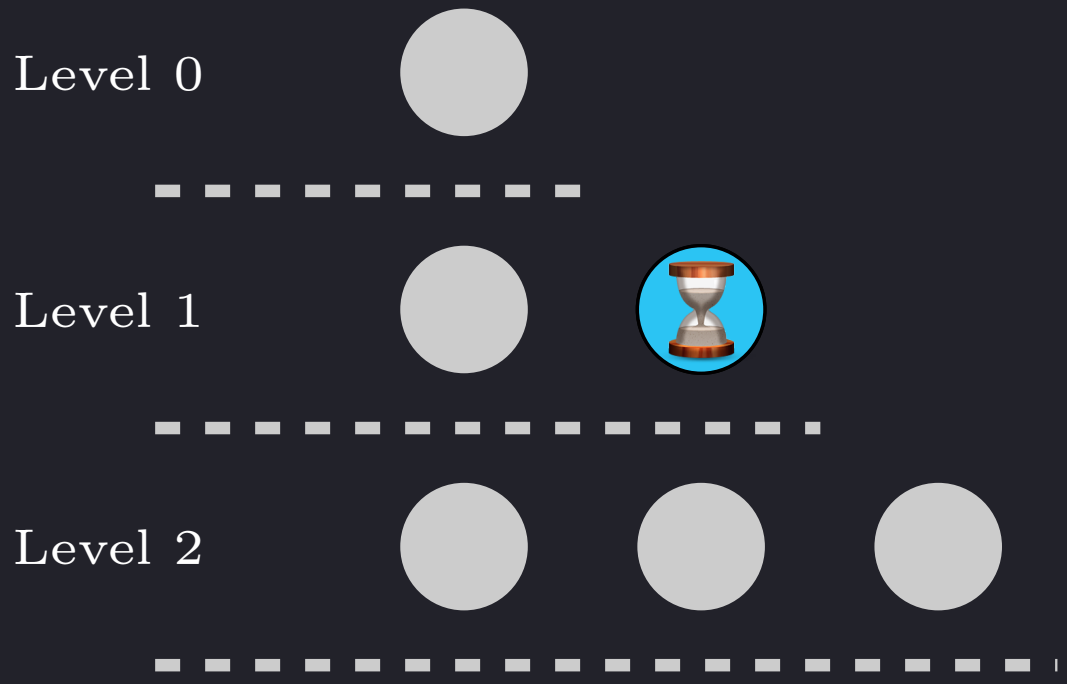
EFFECT OF UNCONSCIOUS BIAS IN HIERARCHICAL SYSTEM

HIERARCHICAL SYSTEM



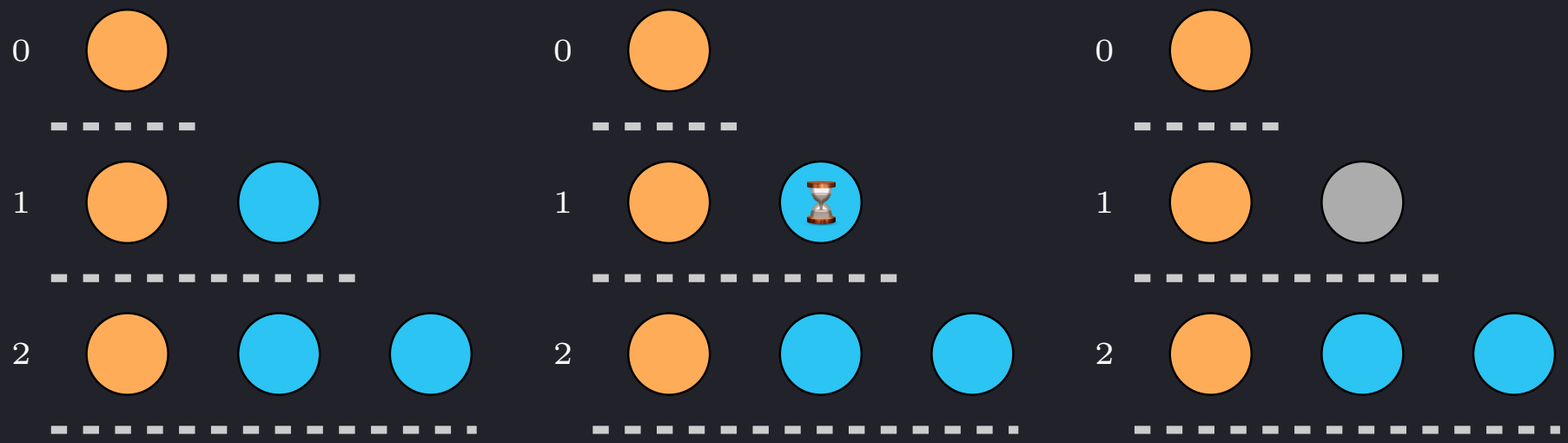

Level 0
Level 1
Level 2

Level 0
Level 1
0.2
Level 2

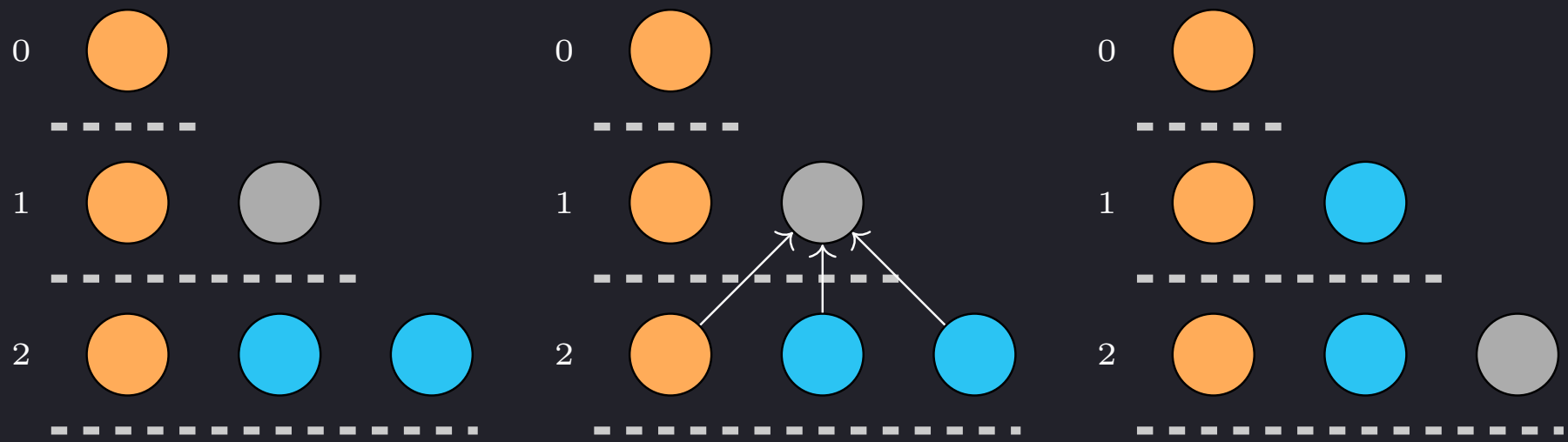

Level 0
Level 1
Level 2

```
>>> import hierarchical as hrcy
>>> import numpy as np
>>> import scipy.stats

>>> competence_distribution = scipy.stats.uniform(0, 1)
>>> retirement_rate = 0.2
>>> capacities = [3, 2, 1]

>>> np.random.seed(0)
>>> states = list(hrcy.states.get_competence_states(
...         capacities, competence_distribution, retirement_rate)
... )

>>> for level_index, level in enumerate(states[6]):
...     print(f"Level {2 - level_index}")
...     for individual in level:
...         print(
...             f"""-|type {individual.individual_type} with
...     competence {individual.competence:.3f} retirement {individual.retirement_date:.3f}"""
...         )
Level 2
-|type 0 with
    competence 0.438 retirement 0.445
-|type 1 with
    competence 0.964 retirement 0.097
-|type 1 with
    competence 0.792 retirement 0.151
Level 1
-|type 0 with
    competence 0.360 retirement 0.115
-|type 1 with
    competence 0.698 retirement 0.012
Level 0
-|type 0 with
    competence 0.209 retirement 0.035
```

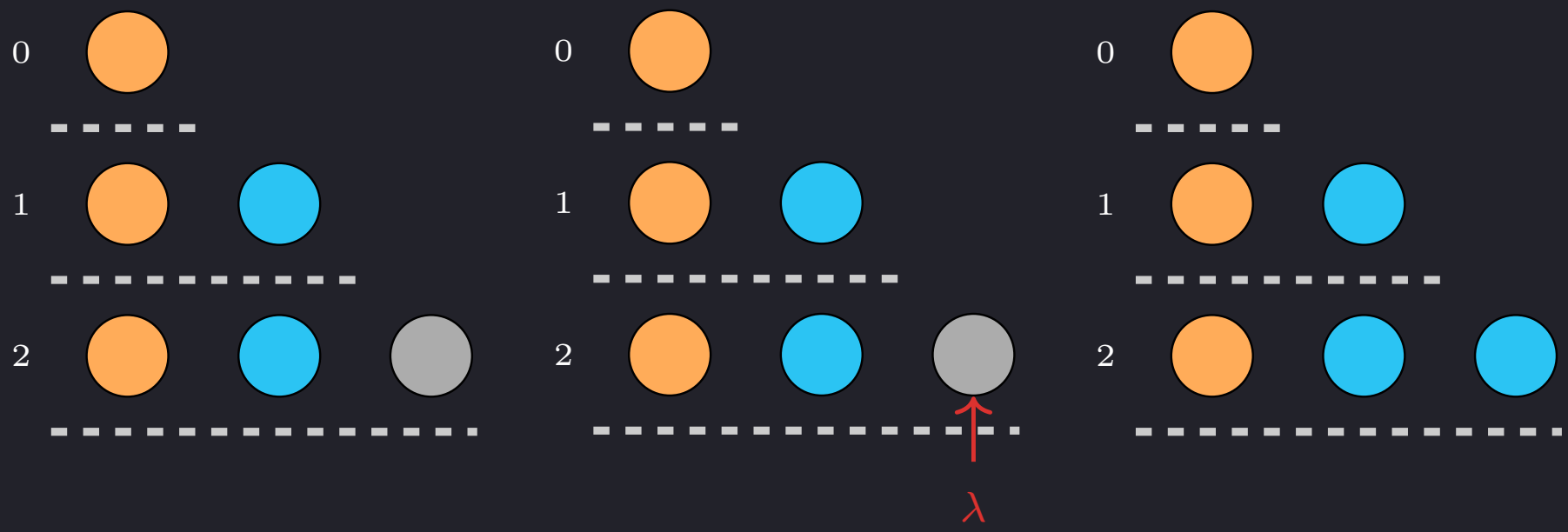
RETIREMENT



PROMOTION



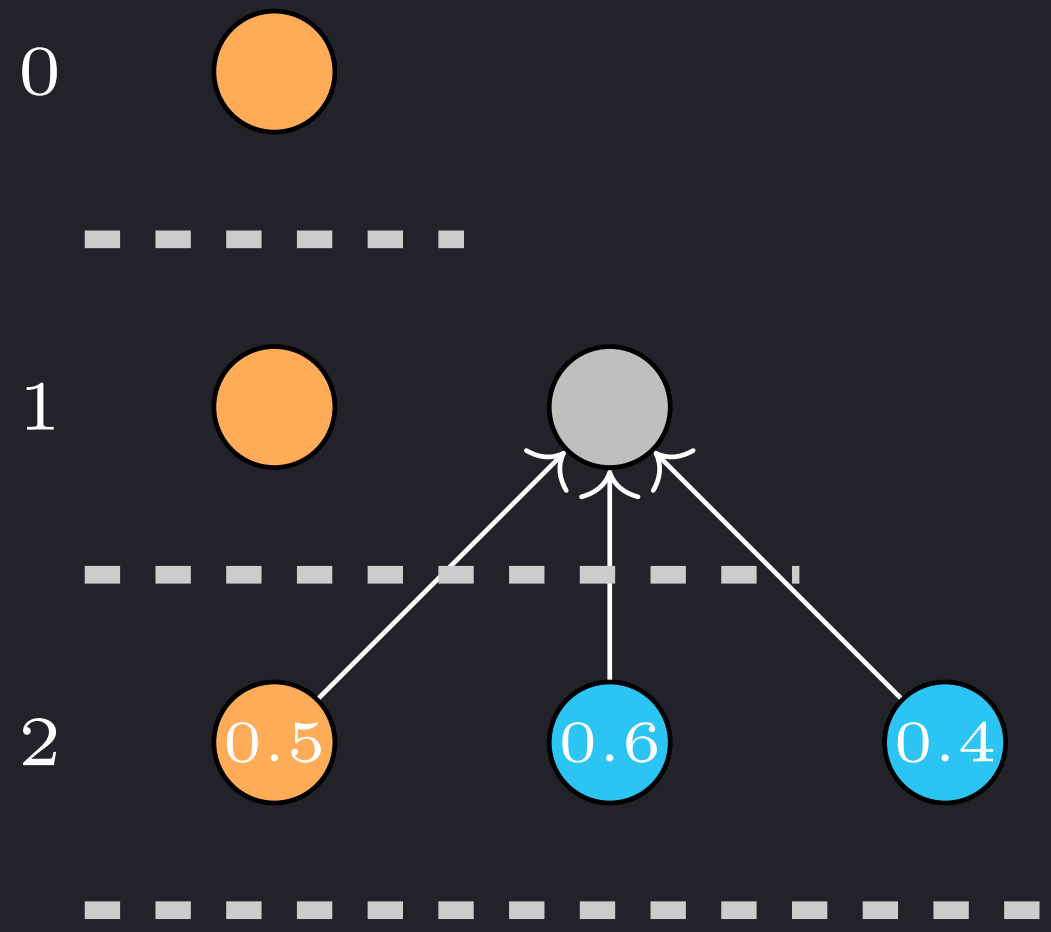
HIRING

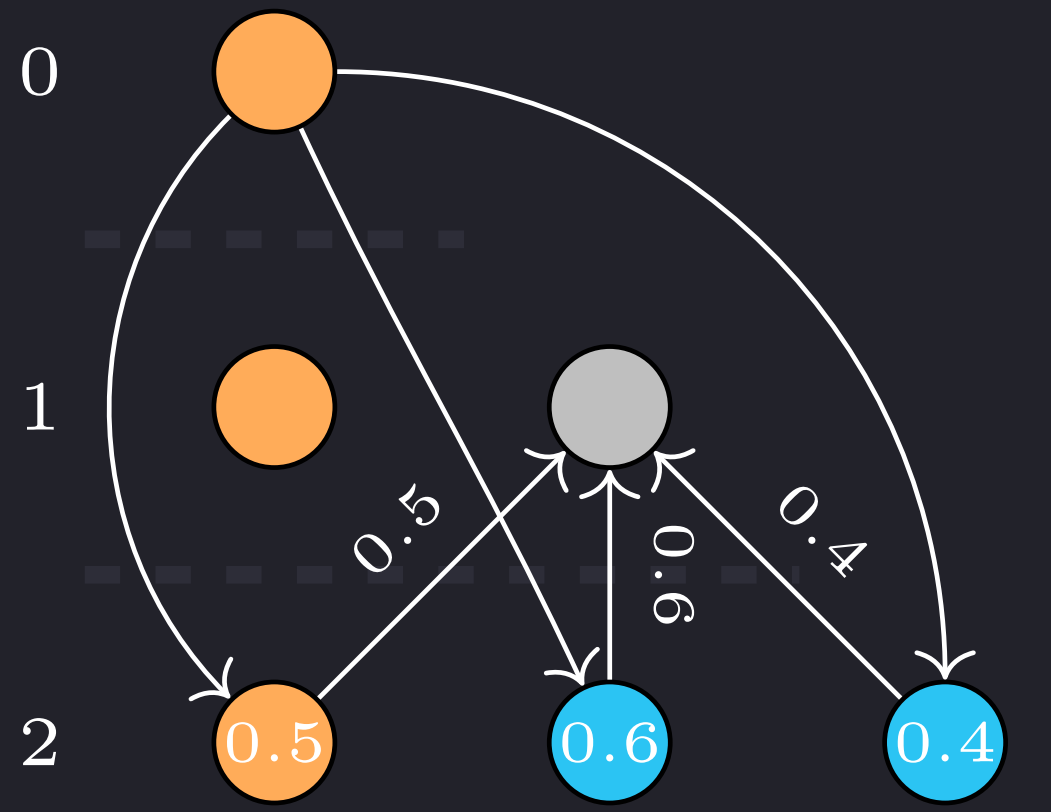


RETIREMENT

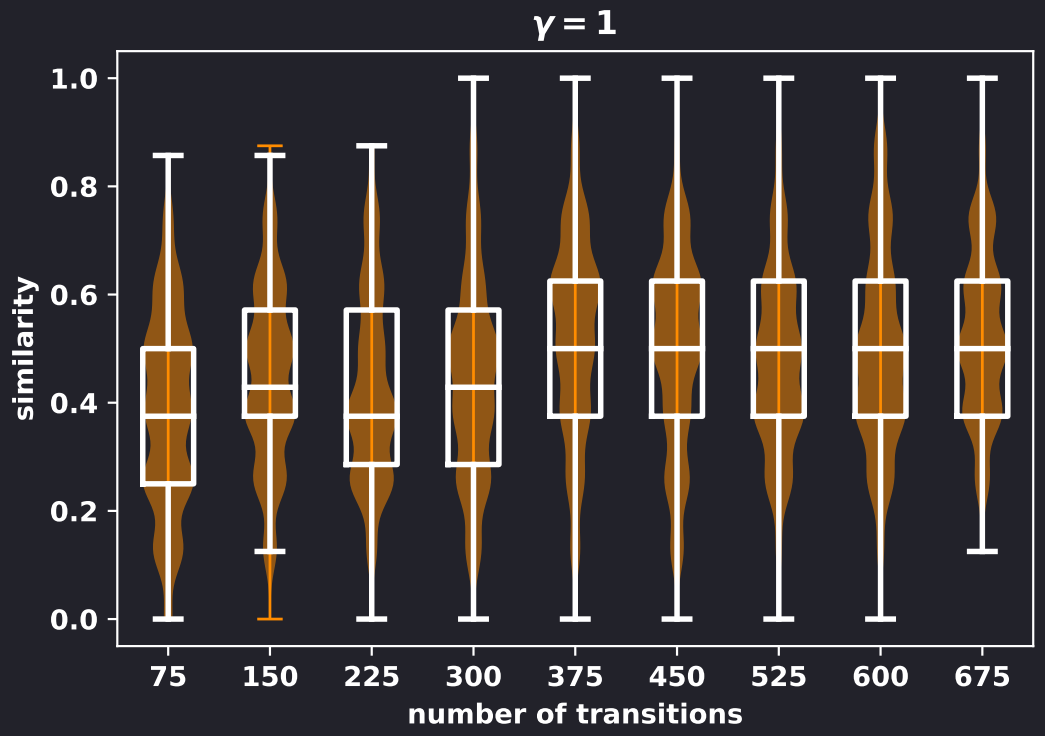
HIRING

PROMOTION


0
1
2
0.5
0.6
0.4

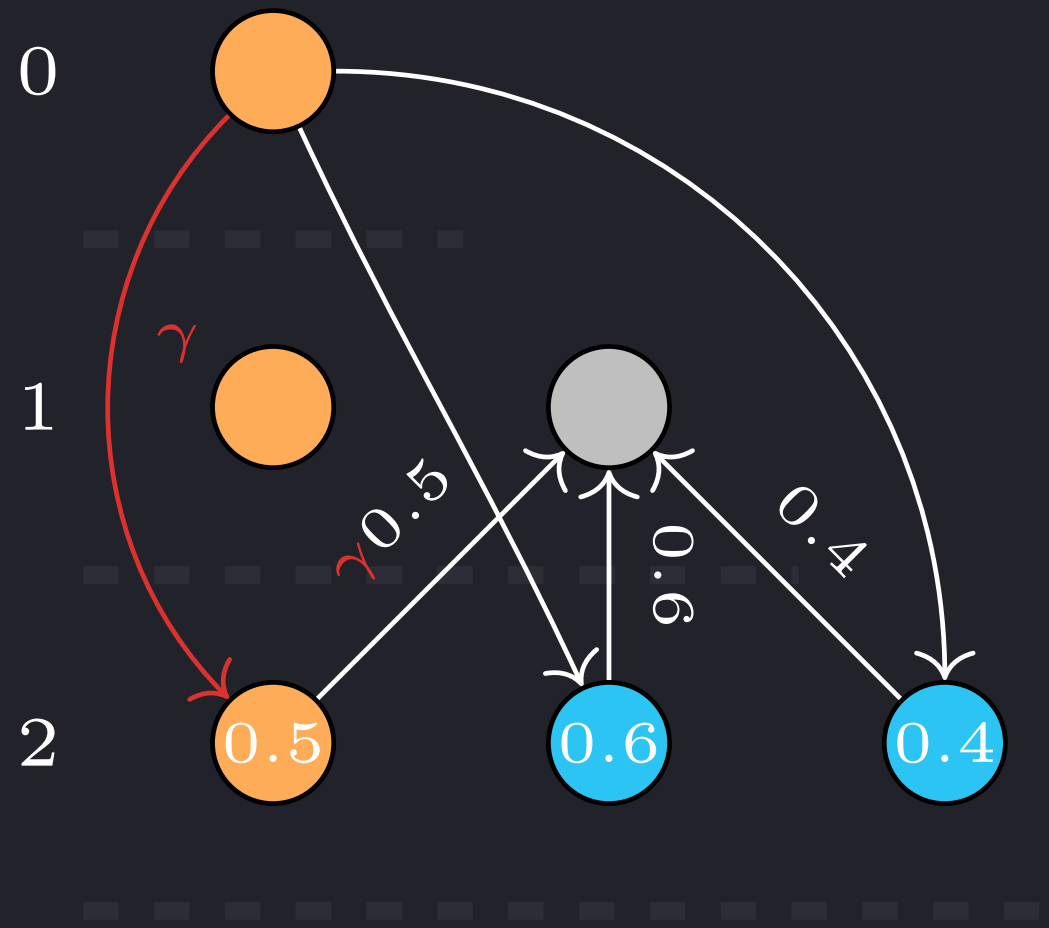

0
1
2
0.5
0.6
0.4
0.5
0.6
0.4

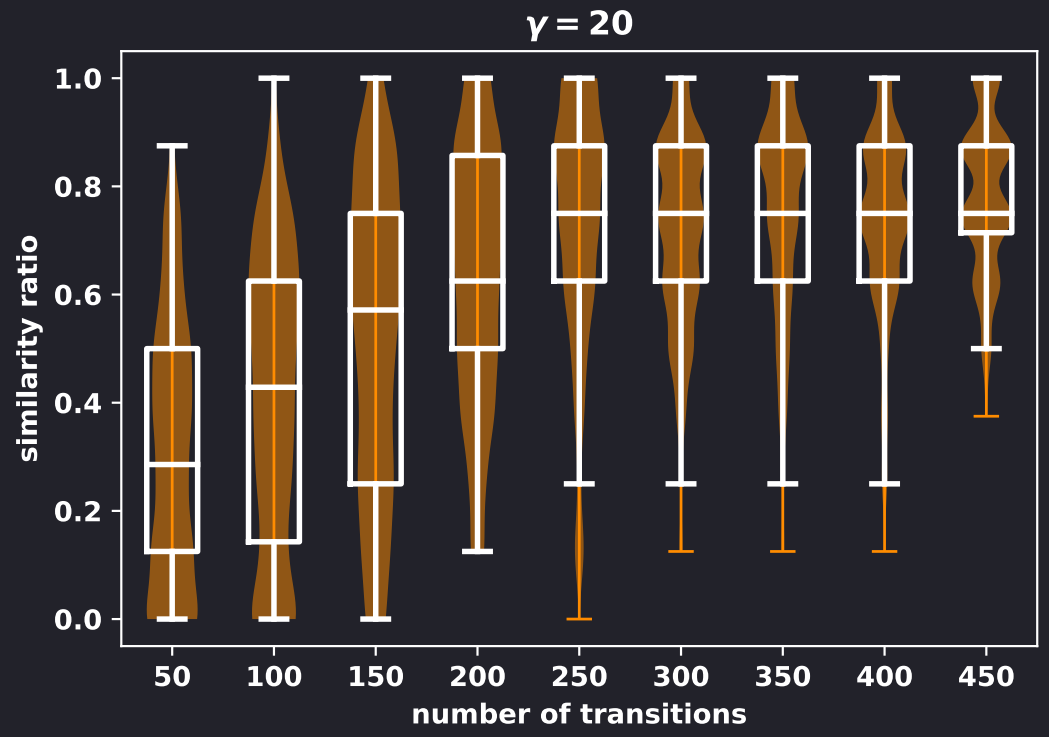
```
>>> capacities = [9, 6, 2, 1]

>>> competence_distribution = scipy.stats.uniform(0, 1)
>>> retirement_rate = 0.2
>>> lmbda = [10, 10]
```

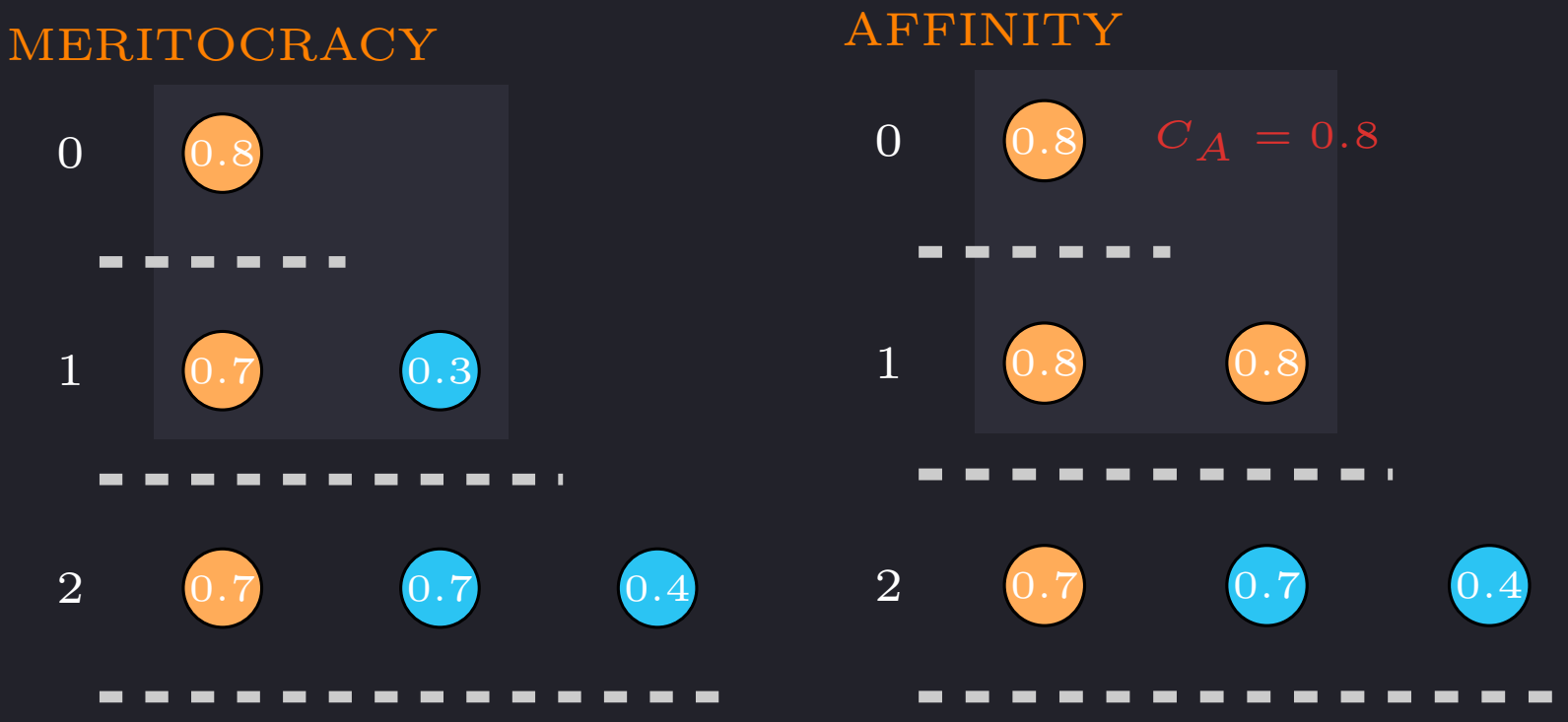

$\gamma = 1$
similarity
1.0
0.8
0.6
0.4
0.2
0.0
75
150
225
300
375
450
525
600
675
number of transitions

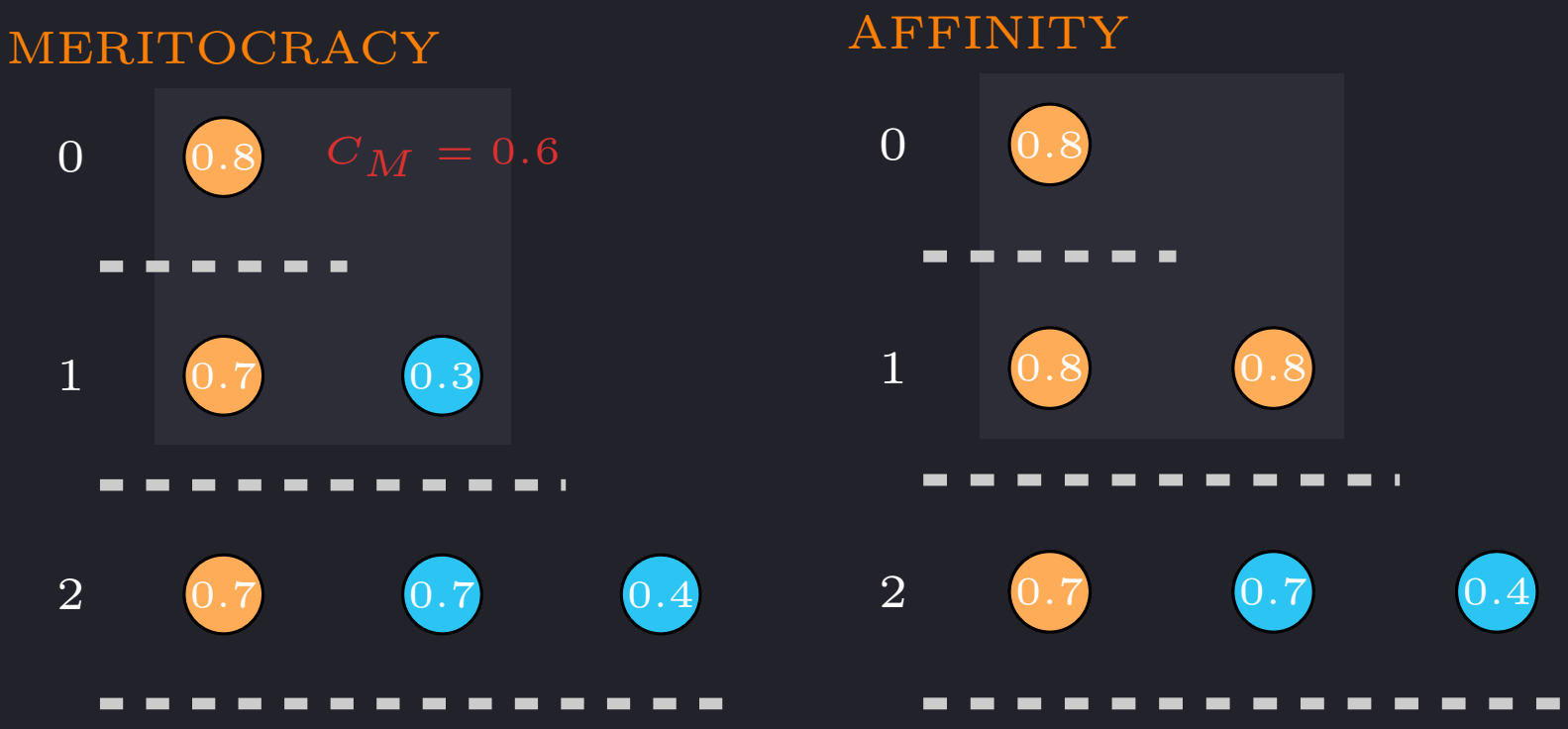
UNCONSCIOUS BIAS

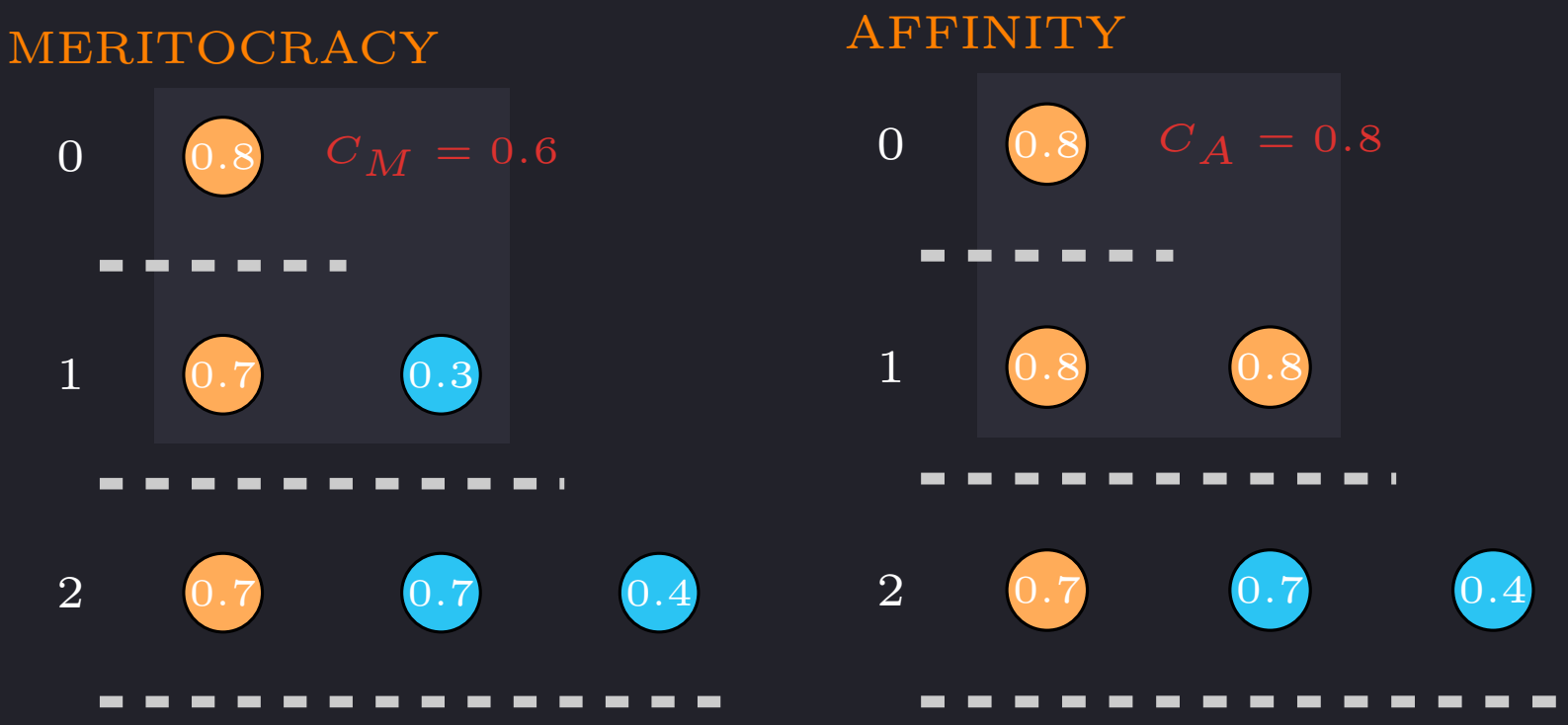
AFFINITY BIAS


0
1
2
γ
$\gamma 0.5$
0.6
0.4
0.5
0.6
0.4

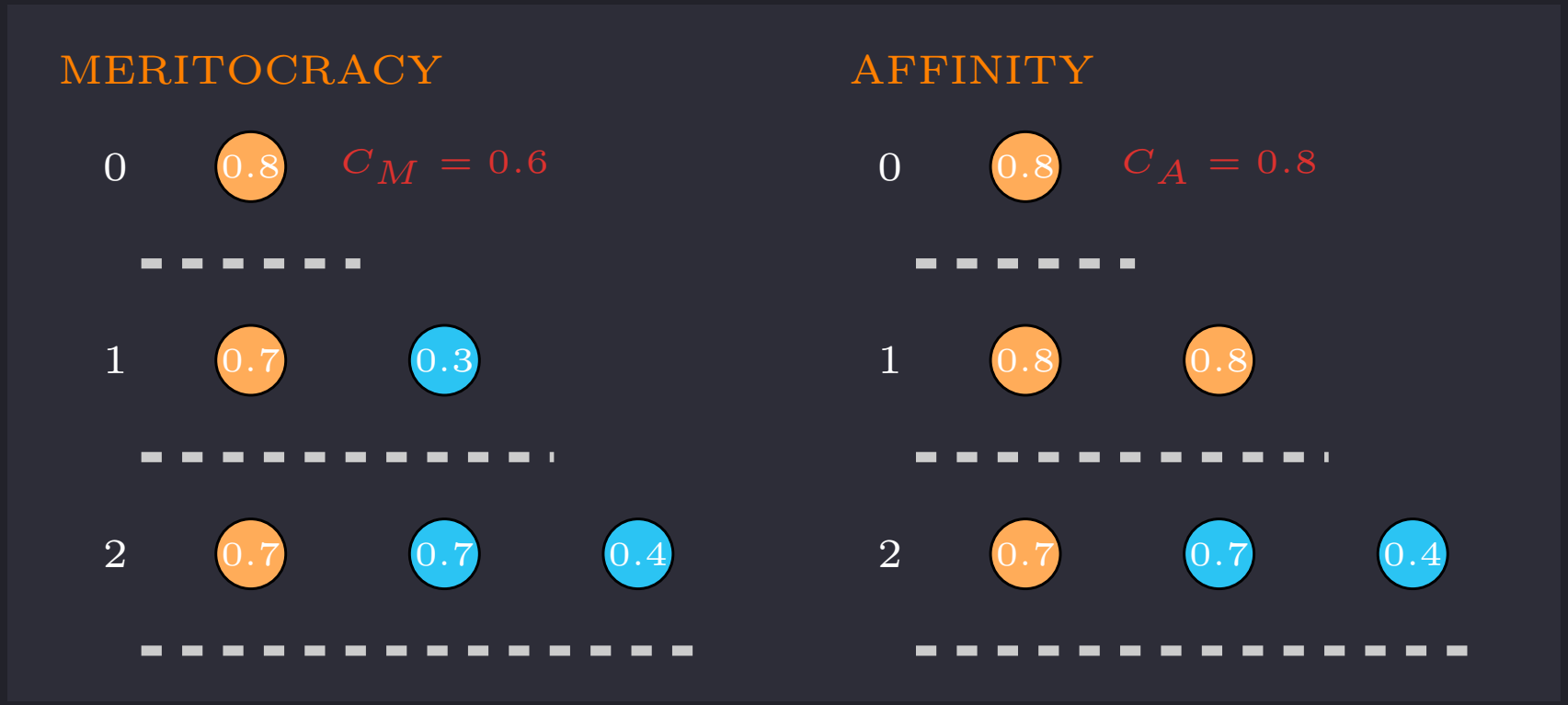

$\gamma = 20$
similarity ratio
1.0
0.8
0.6
0.4
0.2
0.0
50
100
150
200
250
300
350
400
450
number of transitions


MERITOCRACY
0
0.8
1
0.7
0.3
2
0.7
0.7
0.4
AFFINITY
0
0.8
$C_A = 0.8$
1
0.8
0.8
2
0.7
0.7
0.4

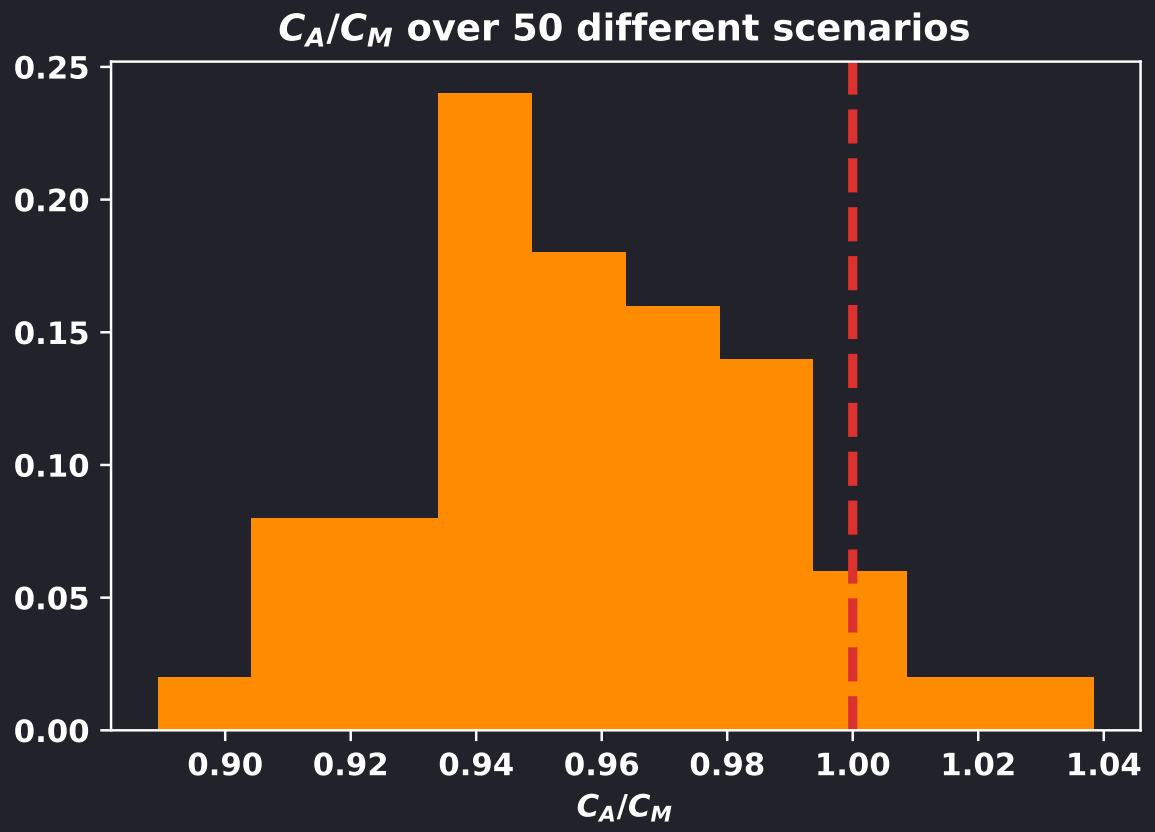

MERITOCRACY
0
0.8
$C_M = 0.6$
1
0.7
0.3
2
0.7
0.7
0.4
AFFINITY
0
0.8
1
0.8
0.8
2
0.7
0.7
0.4

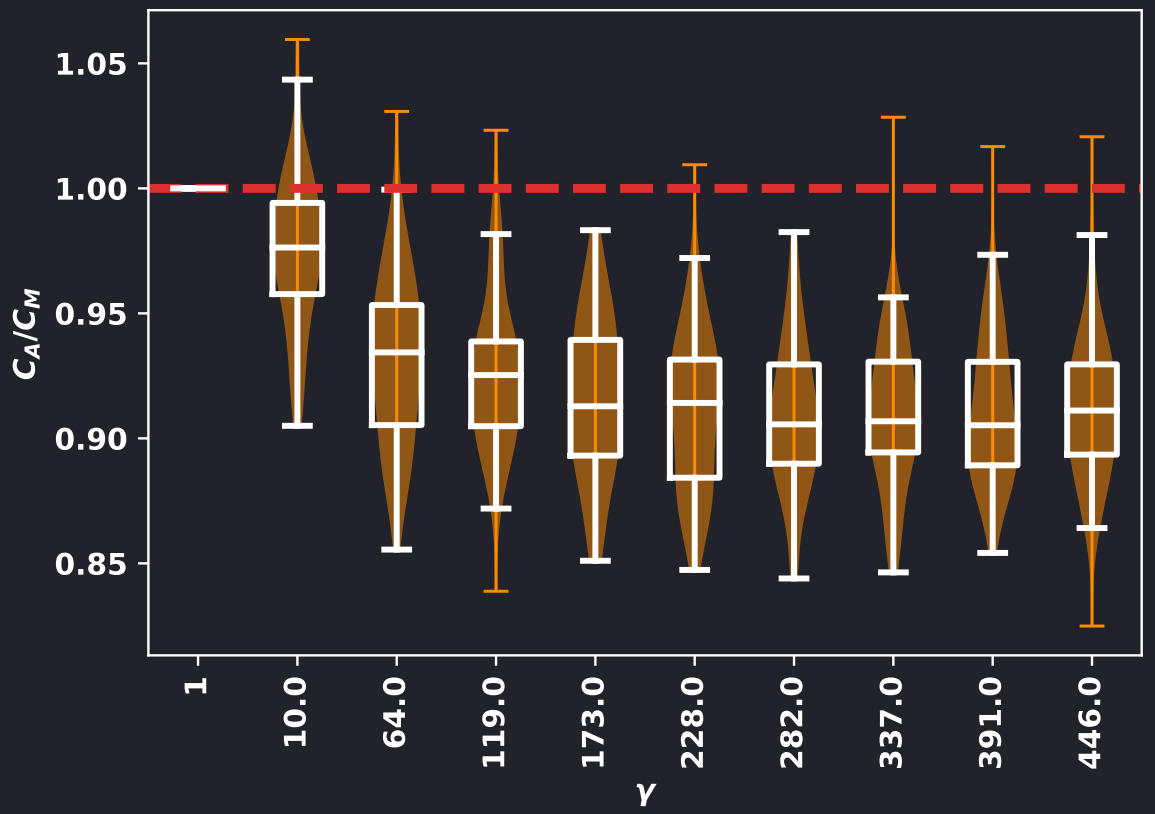

MERITOCRACY
0
0.8
$C_M = 0.6$
1
0.7
0.3
2
0.7
0.7
0.4
AFFINITY
0
0.8
$C_A = 0.8$
1
0.8
0.8
2
0.7
0.7
0.4

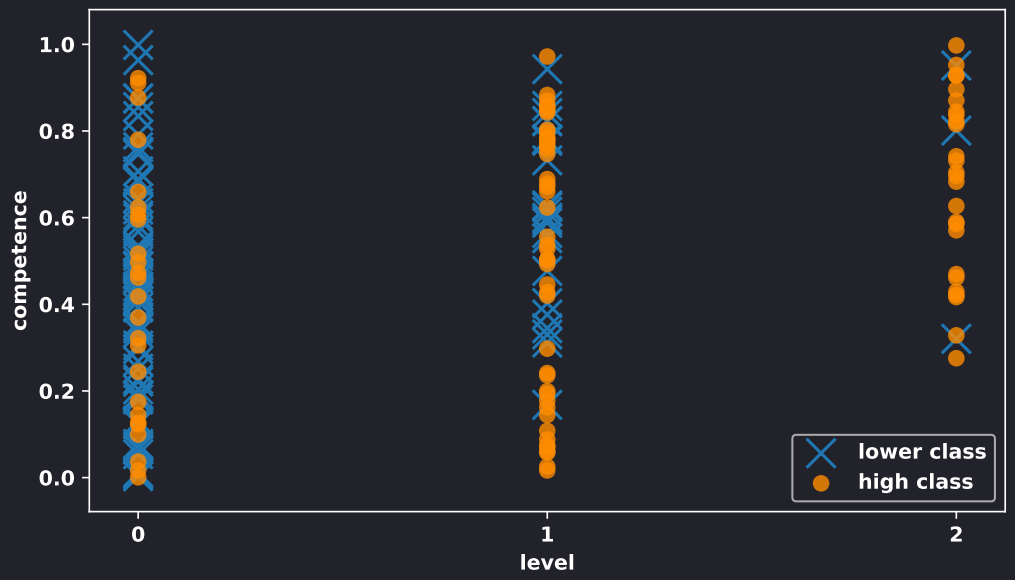
np.random.seed(seed)



HOW MUCH WORSE IS THE SYSTEM BECAUSE OF AFFINITY BIAS?


C_A/C_M over 50 different scenarios
0.25
0.20
0.15
0.10
0.05
0.00
0.90
0.92
0.94
0.96
0.98
1.00
1.02
1.04
C_A/C_M


1.05
1.00
0.95
0.90
0.85
C_A/C_M
1
10.0
64.0
119.0
173.0
228.0
282.0
337.0
391.0
446.0
γ


competence
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
level
lower class
high class

ANSWERS?

BE AWARE OF YOUR
UNCONSCIOUS BIAS

BE AN ALLY

DO NOT BE LAZY

@NikoletaGlyn
@drvinceknight

- https://nikoleta-v3.github.io
- vknight.org/unpeudemath/math/2017/11/10/the-fallacy-of-meritocracy.html
- github.com/drvinceknight/HierarchicalPromotion