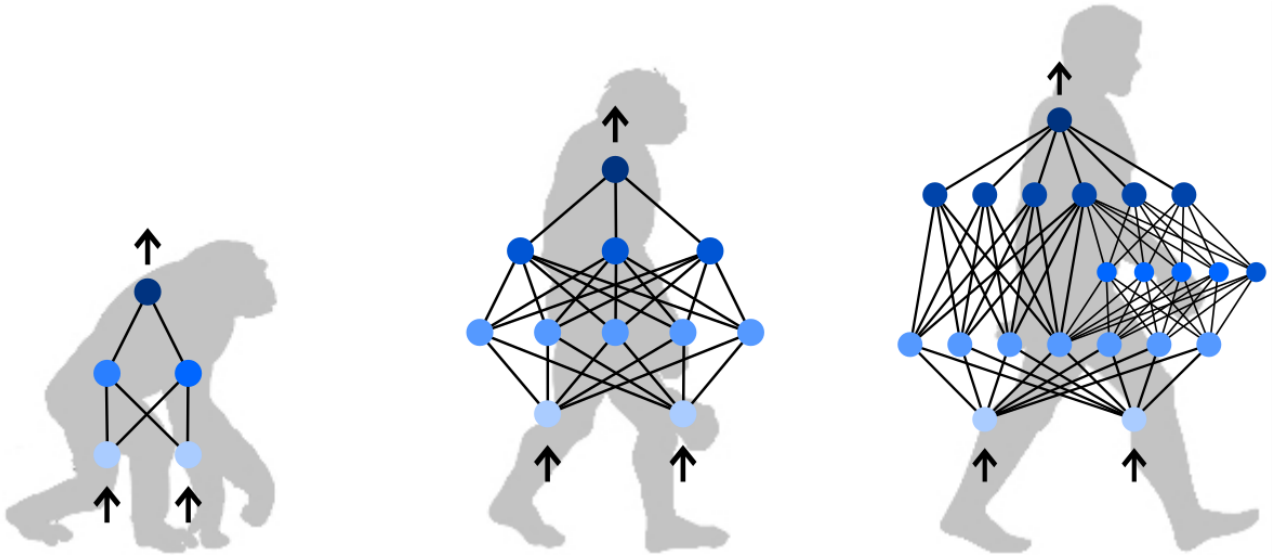
NEAT ALGORITHM

Neuro Evolution of Augmenting Topologies by Ken Stanley, MIT, 2002

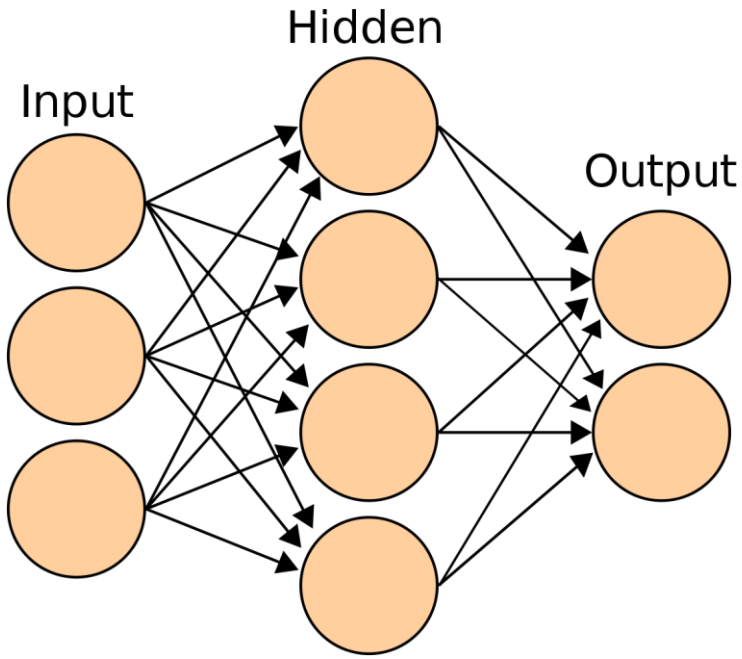
http://nn.cs.utexas.edu/downloads/papers/stanley.ec02.pdf

Presentation by : Jetnipat Lapsuwannawong

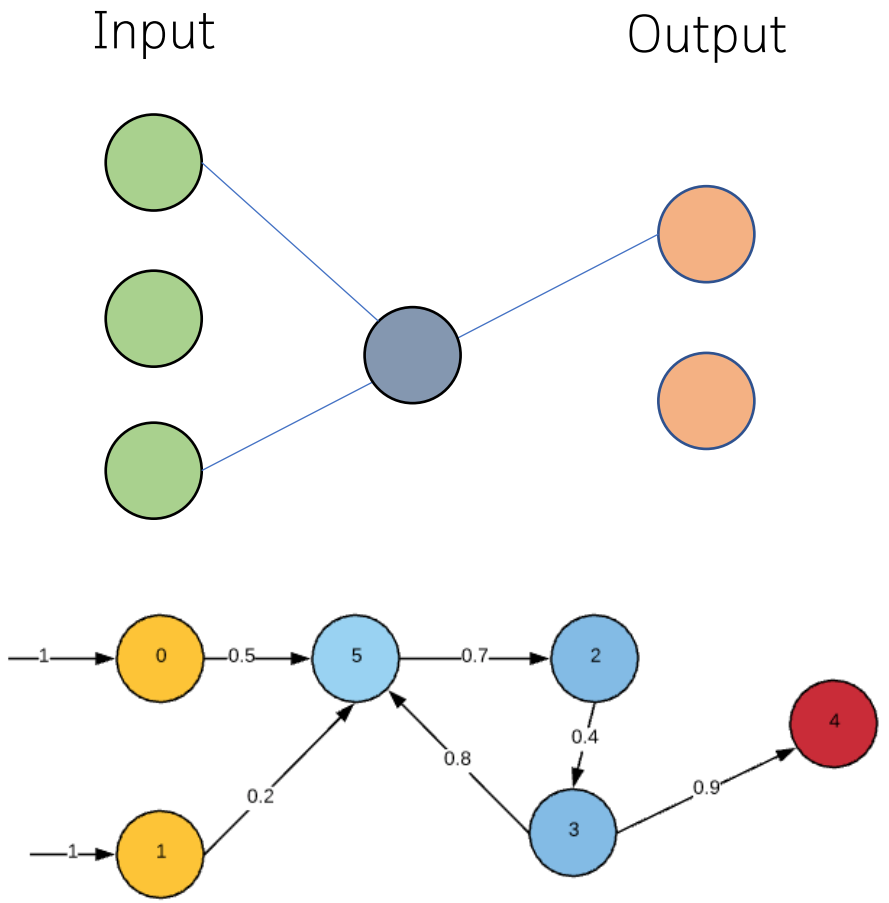
Neuro Evolution Augmenting Topologies



Neuro



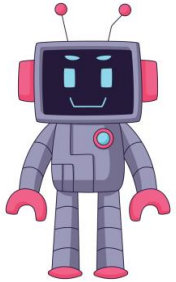
Classic Dense
Neural Network



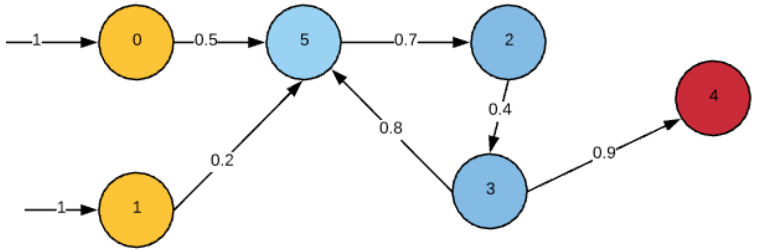
Neural Network in NEAT

Evolution

- Crossover
- Mutation
- Selection



Agent



Neural Network

Encode

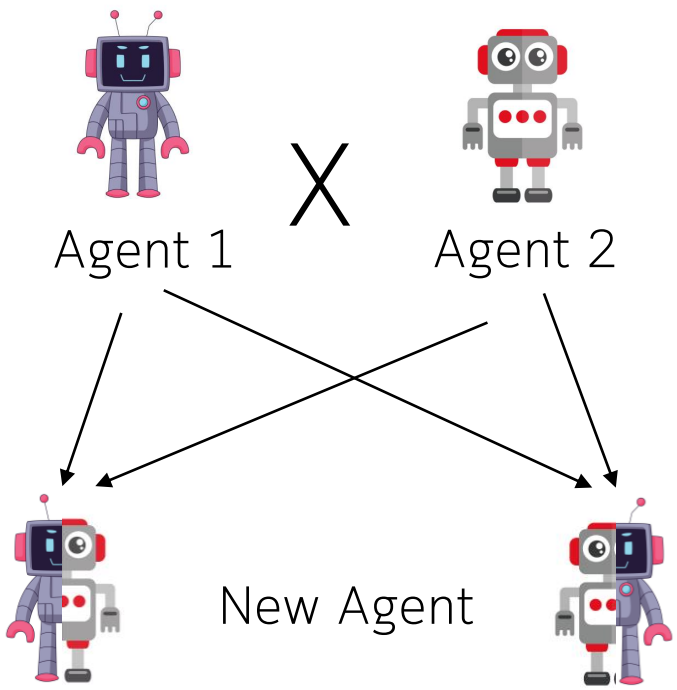
Node Gene	0	1	2	3	4	5

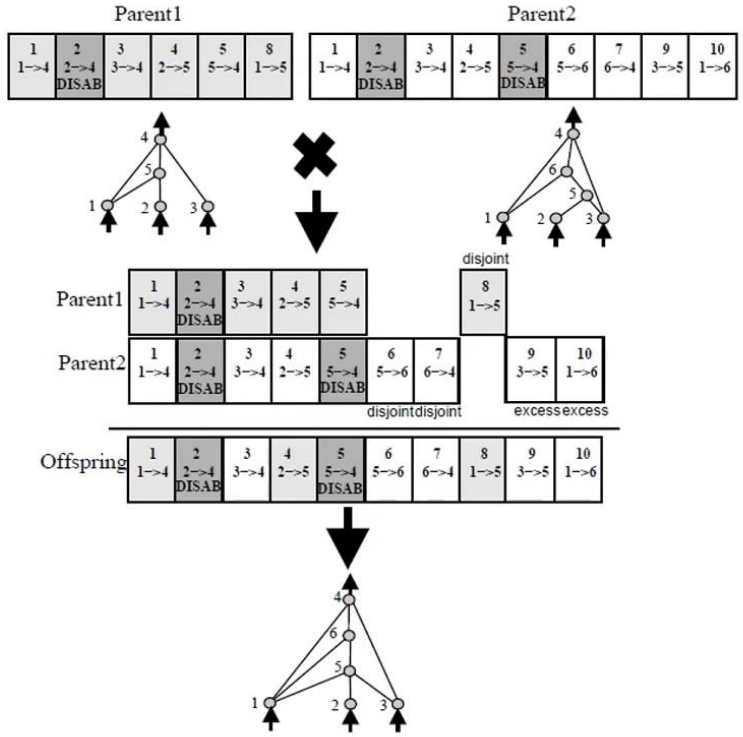
Connection Gene	0 -> 5	1 -> 5	5 -> 2	3 -> 5	2 -> 3	3 -> 4
	0.5	0.2	0.7	0.8	0.4	0.9

Genome

Evolution

- Crossover
- Mutation
- Selection

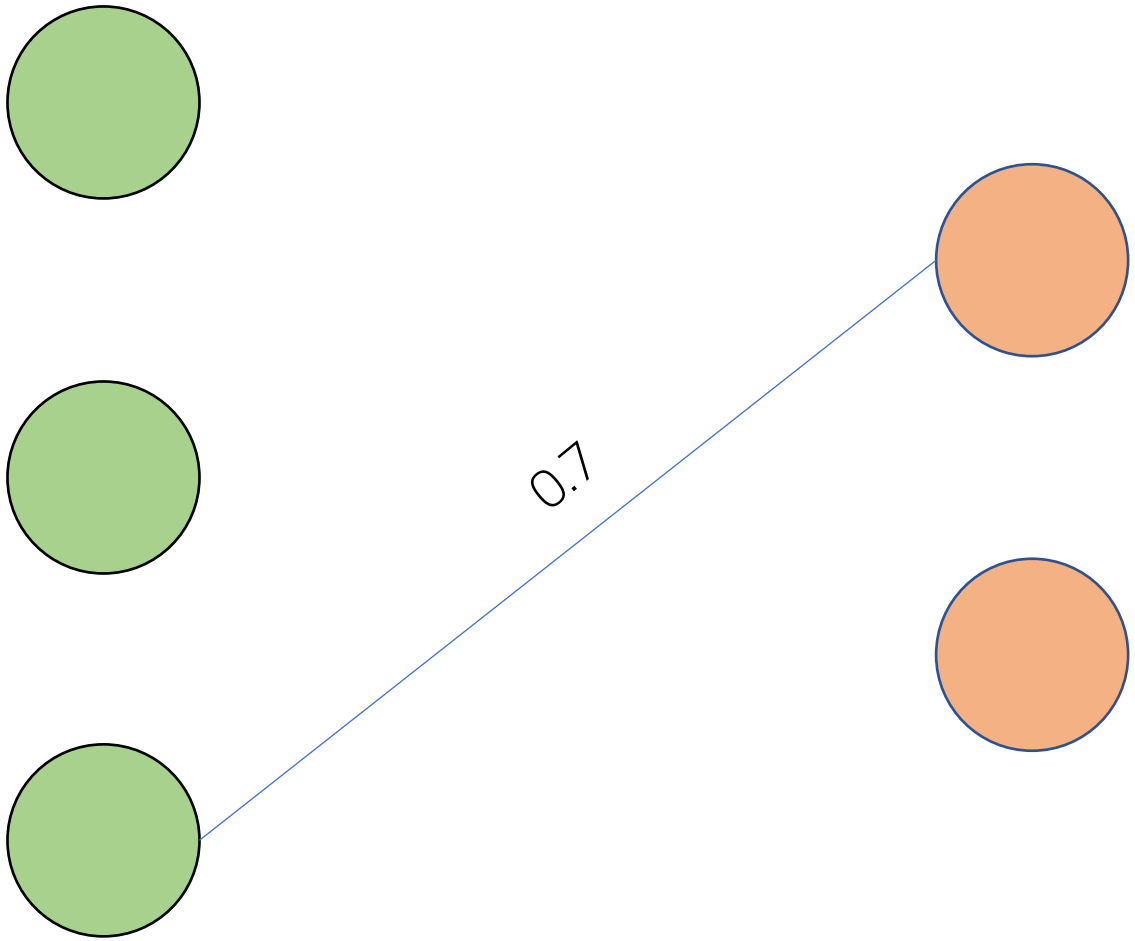




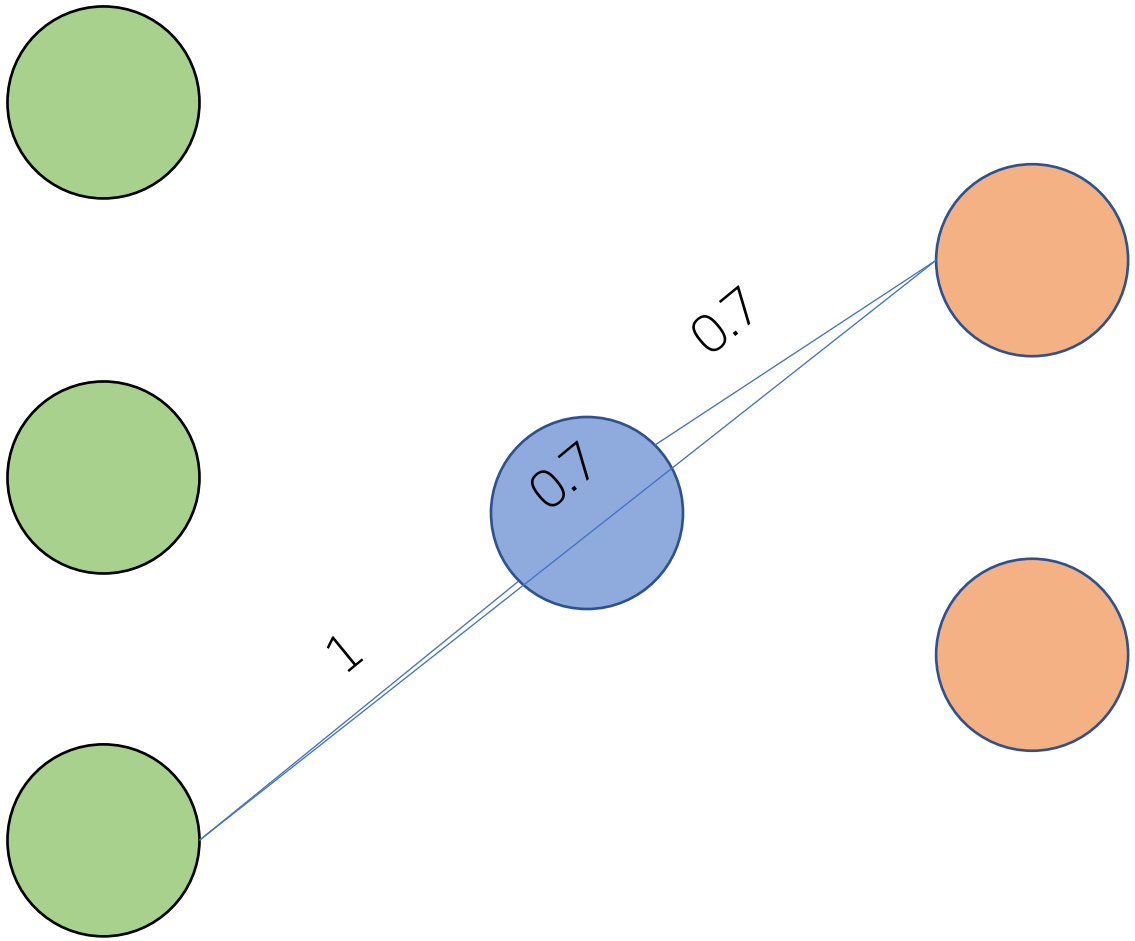
Evolution

- Crossover
- Mutation
- Selection

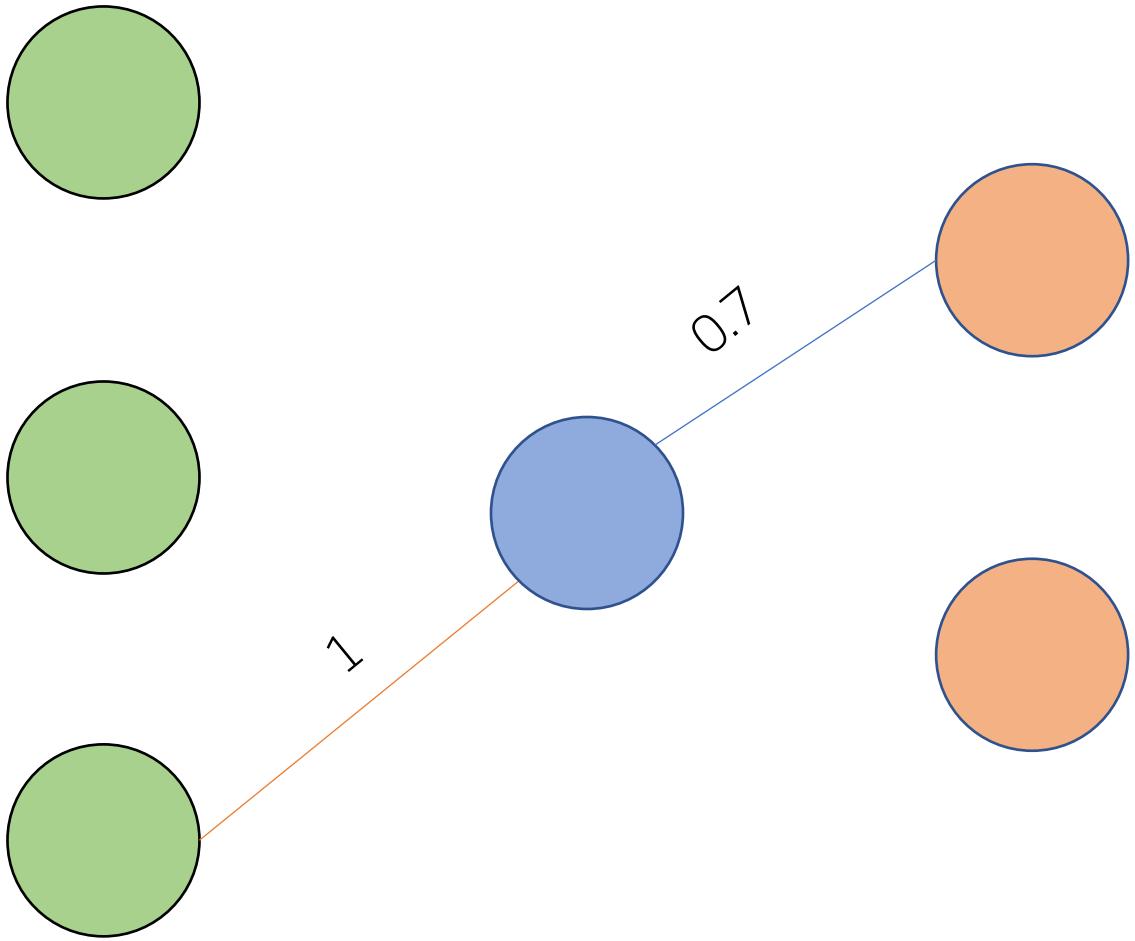
Mutation : mutate_link



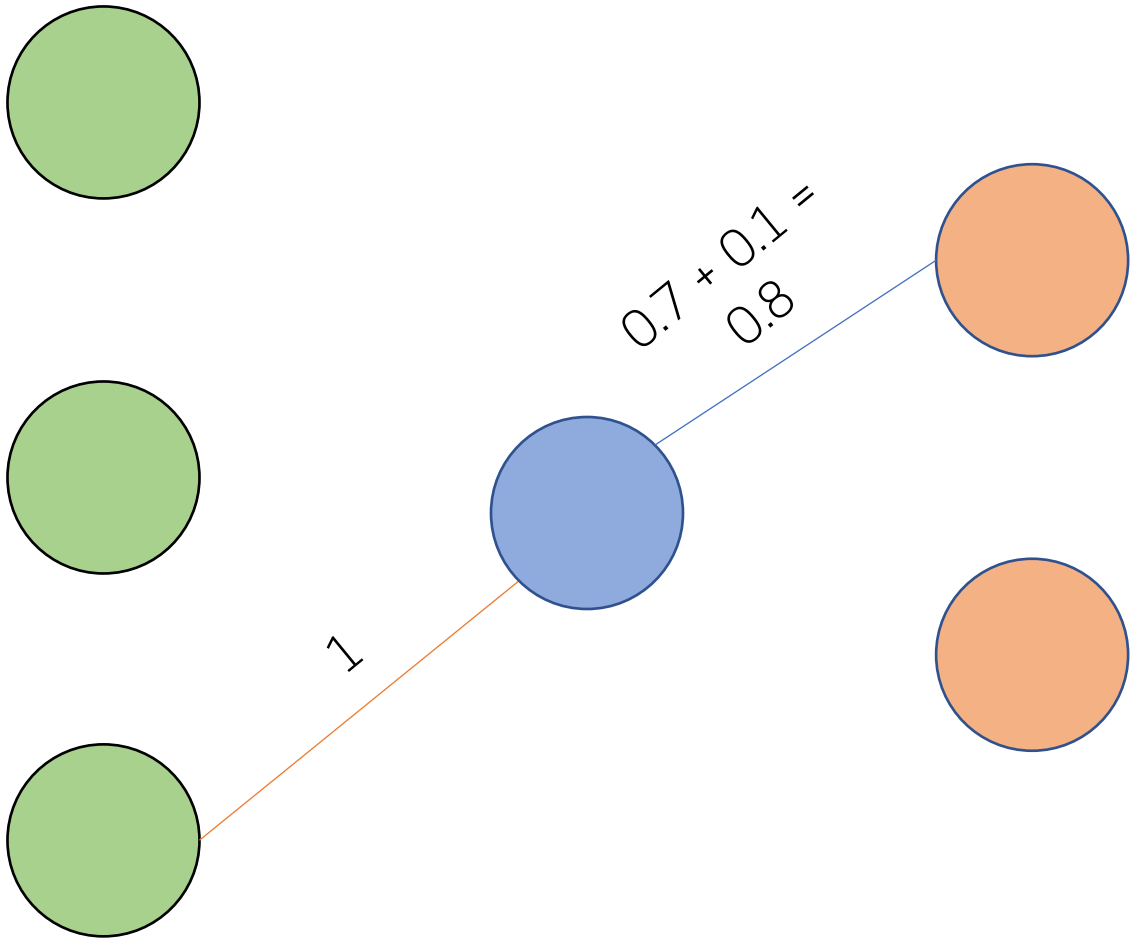
Mutation : mutate_node



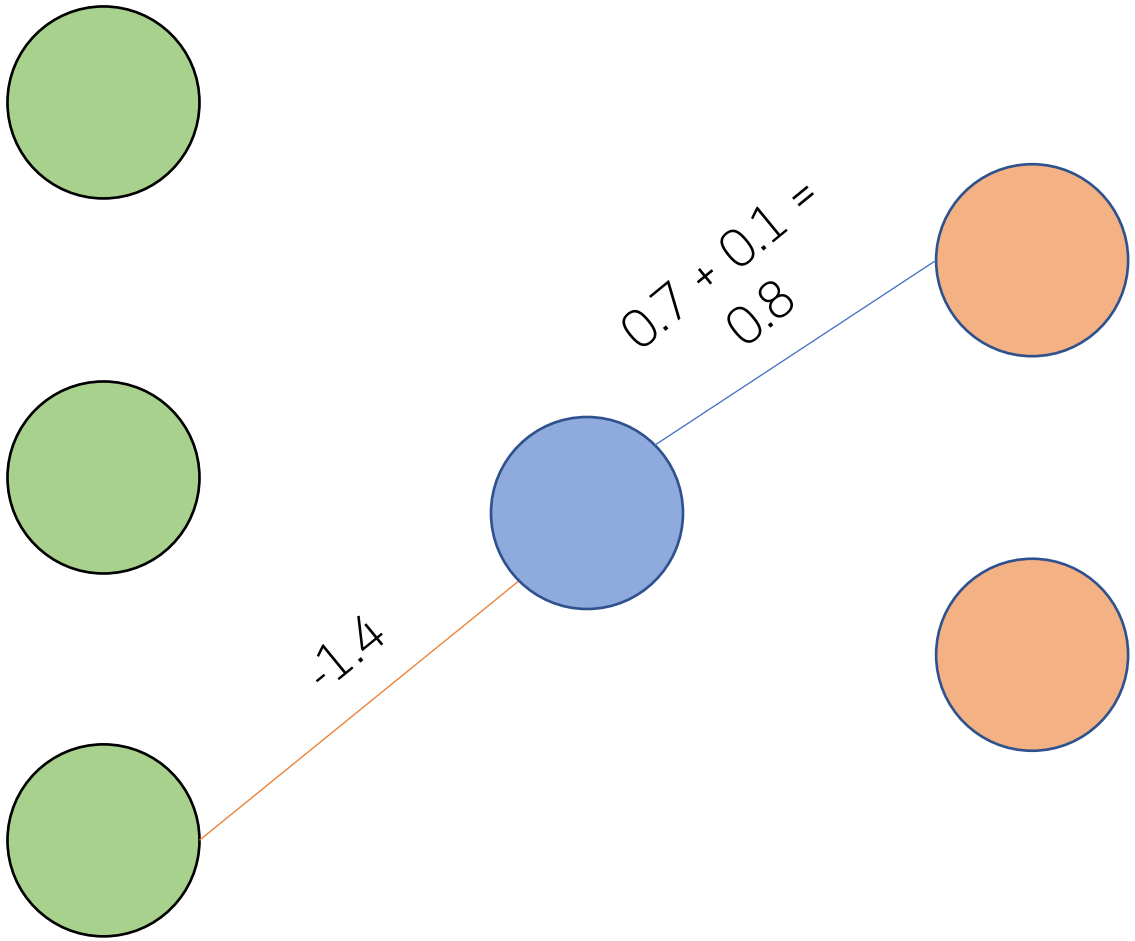
Mutation : mutate_enable_disable



Mutation : mutate_weight_shift

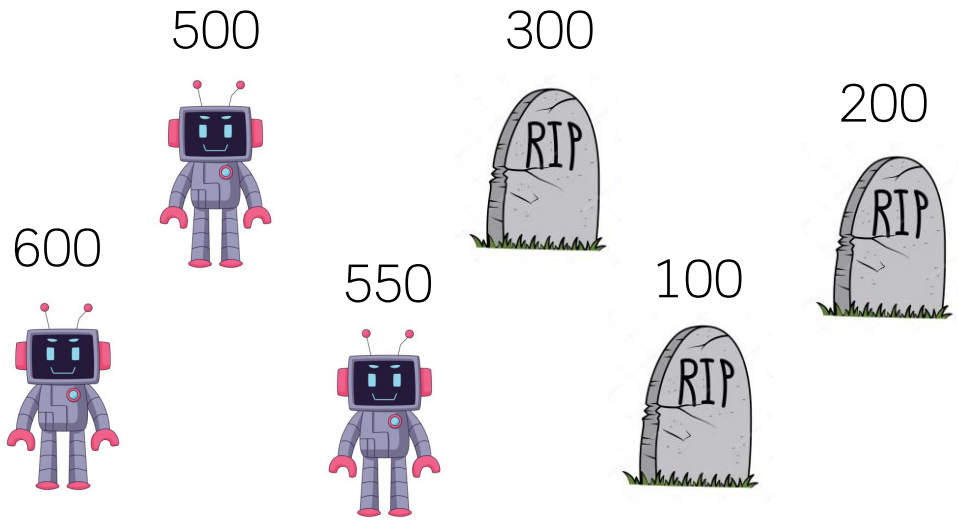


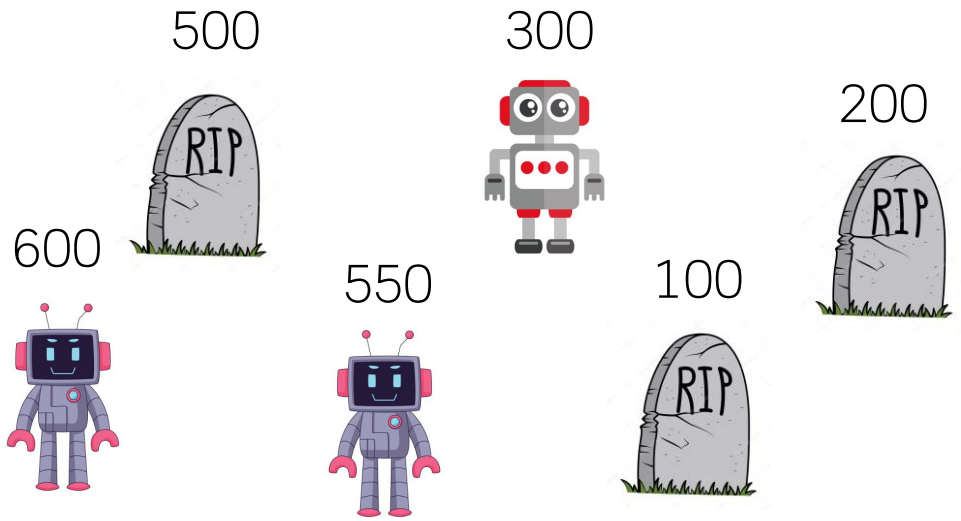
Mutation : mutate_weight_random



Evolution

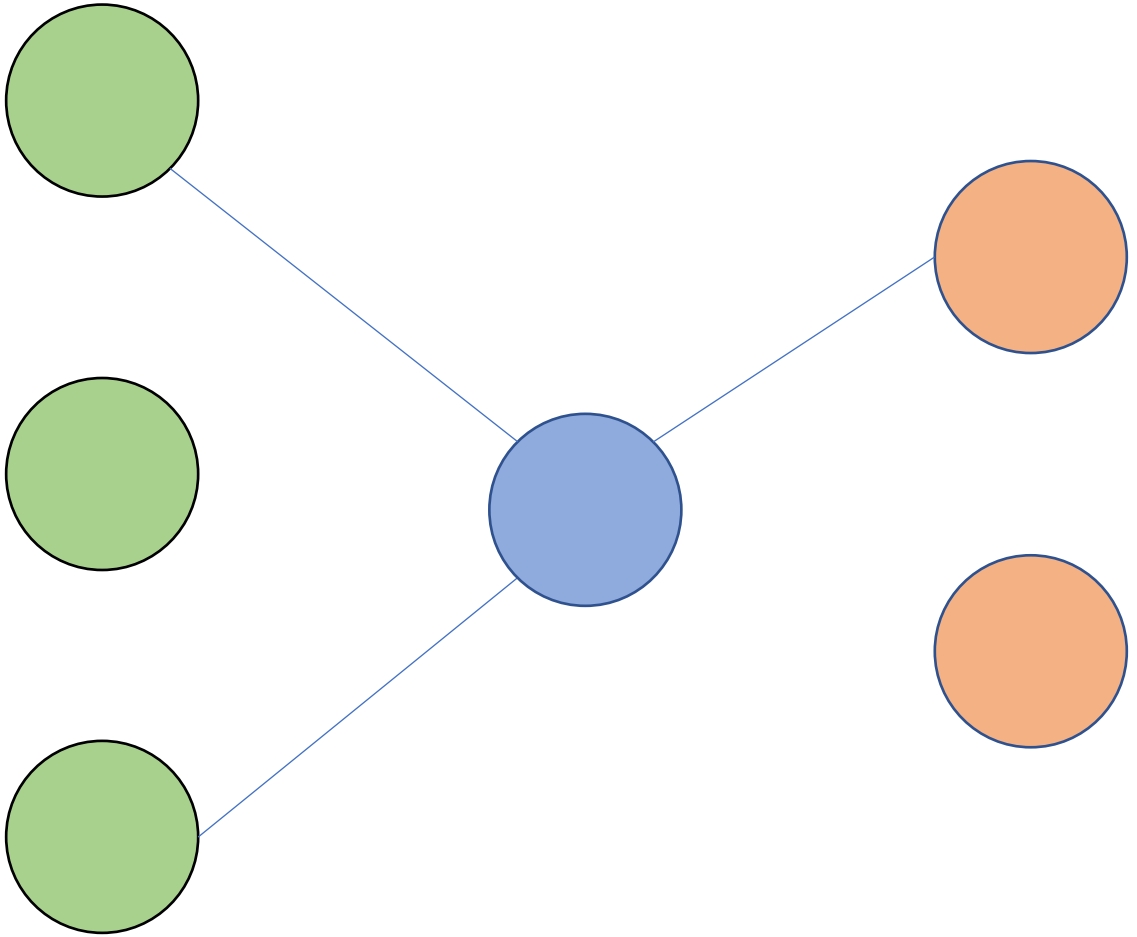
- Crossover
- Mutation
- Selection



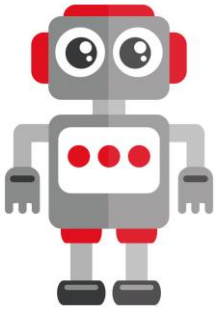


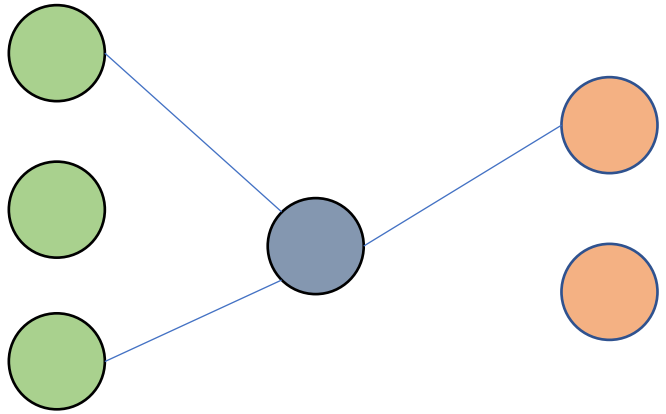
Assume we select 50% to survive.

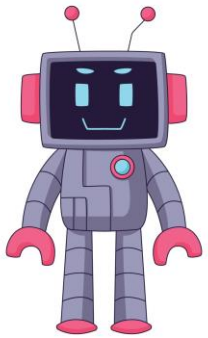
Augmenting

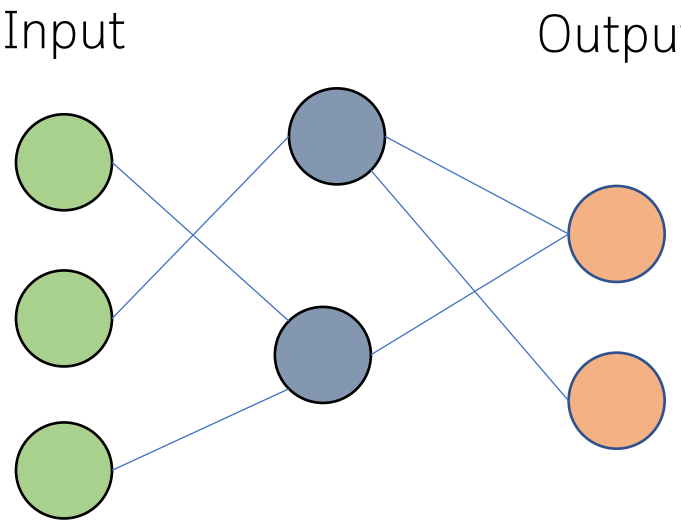


Topologies









Python Library
pip install neat-python

https://neat-python.readthedocs.io/en/latest/