

# Spiking Neural Networks

## Continuous Control

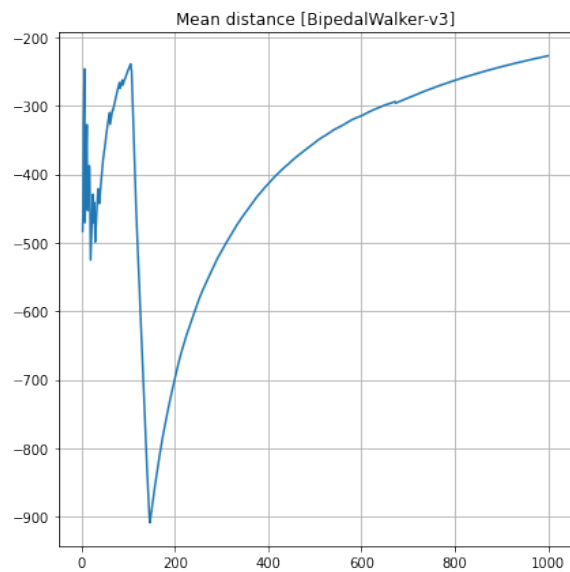
Daniel Kuknyo

# Methods of the experimentation

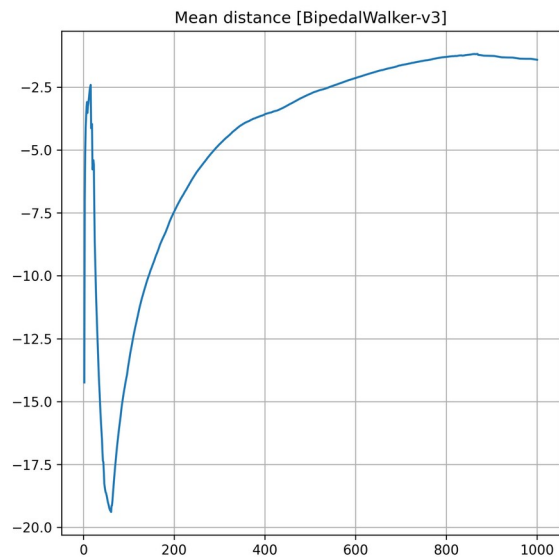
- **Environments: BipedalWalker and MountainCar**
- **Q-learning**
- **Q-learning with state space discretization**
- **Q-learning actor-critic**
- **Soft actor-critic for continuous control**
- **SA2C soft actor dual critic for continuous control**
- **SA2C with feedforward actor and spiking critic**

# Distances walked

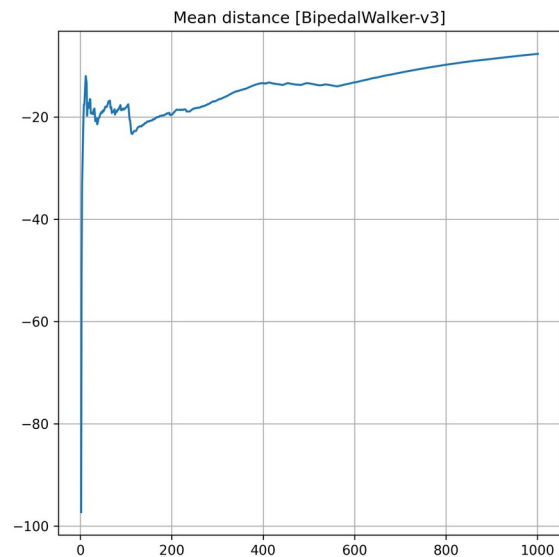
## SAC



## SA2C

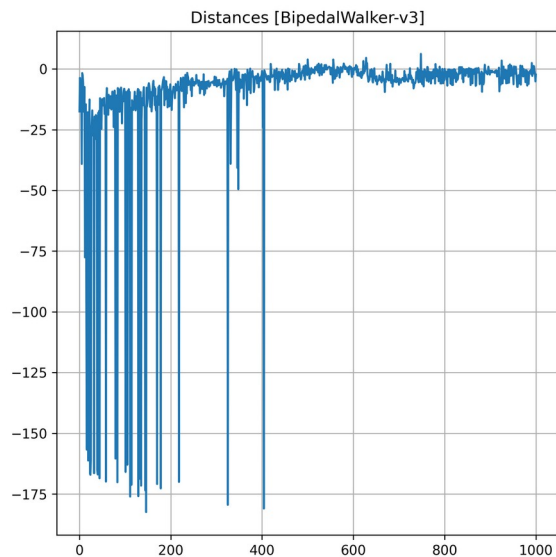


## SA2CF

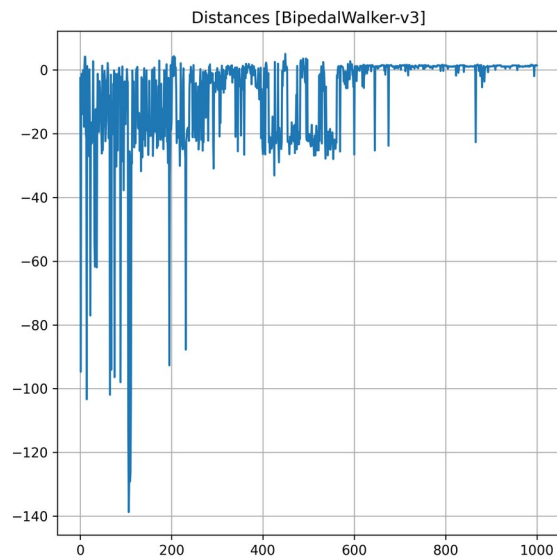


# Rewards

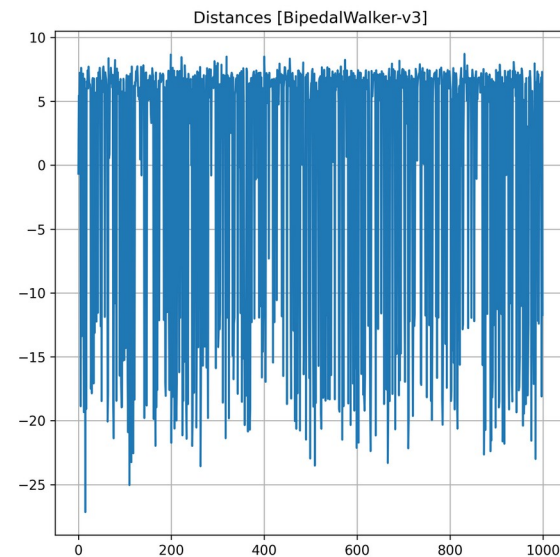
## SAC



## SA2C



## SA2CF



# Conclusions

- **The best performing model was the one with two spiking critics and one simple feedforward actor**
- **The worst approach was to discretize the action space**
- **Adding neurons to the layers improved performance**
- **Adding layers to the model deteriorated performance**
- **The best performing models did not have time to finish due to interruptions**
- **The most difficult problem to handle was the differences in dimensionality added due to Gaussian currents and prediction iterations**