Proposal Draft for ADLR Project

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The aim of our project is to train a Reinforcement Learning agent which is able to carry out movements with a robot arm from a starting point to a goal point through challenging environment. Under challenging environment we understand an environment with obstacles in the manipulation space with which the robot arm must not collide during movement. The guidelines along which we will present our final project proposition are as follows:

- We are going to train the robot arm via simulation.

- We are mostly going to incorporate the ideas of Neural Motion Planning [1], Hindsight Experience Replay [2] and Generalized Hindsight Experience Replay [3].

- The final goal is to evaluate the performance of the trained agent in previously unseen environments.

Bibliography

[1] T. Jurgenson and A. Tamar, "Harnessing reinforcement learning for neural motion planning," *arXiv preprint arXiv:1906.00214*, 2019.

[2] M. Andrychowicz, F. Wolski, A. Ray, J. Schneider, R. Fong, P. Welinder, B. McGrew, J. Tobin, O. P. Abbeel, and W. Zaremba, "Hindsight experience replay," in *Advances in neural information processing systems*, 2017, pp. 5048–5058.

[3] A. C. Li, L. Pinto, and P. Abbeel, "Generalized hindsight for reinforcement learning," *arXiv preprint arXiv:2002.11708*, 2020.