# Let start with something good?!

The first paper, that I want to write an abstract about, is called [Grandmaster level in StarCraft II using multi-agent reinforcement learning](https://www.nature.com/articles/s41586-019-1724-z.epdf?author_access_token=lZH3nqPYtWJXfDA10W0CNNRgN0jAjWel9jnR3ZoTv0PSZcPzJFGNAZhOlk4deBCKzKm70KfinloafEF1bCCXL6IIHHgKaDkaTkBcTEv7aT-wqDoG1VeO9-wO3GEoAMF9bAOt7mJ0RWQnRVMbyfgH9A%3D%3D). The name looks too long, and we can call this paper, for short, AlphaStar. This incredible method (I don’t want to call it “algorithm” because it sounds less than the technique is, for me) mixes with mastery techniques as neural networks, imitation learning, reinforcement learning and multi-agent learning, and I call this method incredible because it won professional players in the game Starcraft 2, and with the same limitations that humans have, the method archive the grandmaster position in the official rank of players.

## Learning with humans

The first step consists of learning with replays using a supervised learning. In resume, the supervised learning try to approximate how humans play the game using observations from game’s replays. Those replays are free, public and anonymous. After train with those replays, we have three different AI’s, one for each race, able to play the game in the same level as one human play in the rank gold of the game. It means, if we get those AI’s and put to play matches against humans in the official (and online) championship of Starcraft 2, they will get rank gold ( in order of difficult, bronze, silver, gold, platinum, diamond, master and grandmaster).

I know, that it sounds incredible. Many of us don’t have skills enough to play the game in this level. Therefore, the group of researches, headered by [David Silver](https://www.davidsilver.uk/), knows that the method would be more than a gold rank player.

## AlphaStar League: Where the greats rise!