Teaching Deep Learning
with Low-Cost Educational Robots

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Deep Learning (DL) is a branch of machine learning in Artificial Intelligence which essentially takes advantage of huge datasets to train neural networks. Then the algorithms developed in DL are, for instance, applied for self-driving cars, for playing go against top players or for face emotion recognition. The great impact of DL in recent years is also because of improvements in hardware development and mainly because of open source tools and libraries [MateLabs, 2017]. Additionally, there is a huge range of applications in areas such as robotics, transportation, medicine and last but not least education. With this in mind, we propose to use a raspberry pi, a £30 board with GNU/Linux OS, connected with arduino board, servomotors and pi camera in order to create a simple low cost educational robot where children can learn the basics concepts of deep learning [Durr et al., 2015]. The education robot will be able to perform some examples of architectures of convolutional neural networks to recognise six basic emotions: happy, sad, surprise, fear, anger and neutral [Ho, 2016, Ruiz-Garcia et al., 2016]. Therefore, with many didactic activities children can interact with the educational robot and learn concepts of robotics, linear algebra, machine learning and deep learning.

We believe that teaching deep learning with an educational robot can create both economical and pedagogical impact where children will be persuaded to work towards the creation of better living conditions to anyone, anywhere.

References

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