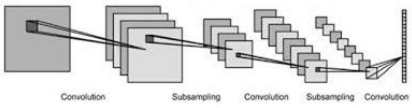
Object recognition using deep neural networks for UAV grasping applications

Master Thesis Proposal in Robotics



(source: http://www.keyword-suggestions.com/cm9ib3RpYyBleWVz/)

Unmanned Aerial Vehicles (UAVs) become very popular and the solution of choice when harsh environments are involved. To increase autonomy, state of the art sensing technologies are needed, ranging from simple proximity sensors to advanced machine vision solutions. The more challenging the task the more advanced sensing technology is required. For grasping application, the UAV must be able to "see" and recognize the object of interest usually from a cluttered background. Lately the field of deep learning has delivered results in image processing and object recognition that achieve "superhuman" performance (http://people.idsia.ch/~juergen/superhumanpatternrecognition.html). The aim of this thesis is to test and implement deep neural network solutions (convolutional neural networks and their variants) for the recognition of objects to be grasped by UAVs.

- The main aim is use deep learning paradigms for the implementation of a machine vision module tuned for a specific grasping application.
    - Machine vision algorithms based on deep neural networks will be the core of the thesis.
    - A machine vision module will be the outcome of the proposed thesis
- Knowledge in image processing/machine vision is a plus.
- Knowledge in deep learning is also a plus but it is not mandatory.
- Basic knowledge of at least one programming language is required.
- The participant will have a weekly discussion with her/his supervisor in order to be guided.

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