

Third meeting

November 3, 2017

Graph based image segmentation

1. Initial results in Efficient Graph based image segmentation.
2. The image is first smoothed with a gaussian filter to remove noise.
3. Every pixel is considered as a vertex and is connected to 4/8 neighbour pixels through edges.
4. Each edge is assigned a weight. In the implementation the distance between [r,g,b] vector of connected vertices is taken as weights.
5. The vertices are then sorted and build in the form of a minimum spanning tree.
6. The tree is then cut into several components and components with a minimum component size is taken as a cluster and given a color.
7. Yet to completely understand the method..

Current state-of-the-art for ASW:

1. Methods focusing on accuracy such as [1] seems to be deep architectures which may not be suitable for embedded implementations.
2. There are papers which focus on deep learning for embedded applications such as [2][3].
3. Which direction to focus on first?

Initial problem formulation for ASW:

- Robocup specific dataset generation.
- Lean model (<1 s and 10MB).
- implementing and integrating the model to the robocup environment.

Notes:

- Dataset generation along with Debaraj.
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References

- [1] Liang-Chieh Chen, George Papandreou, Iasonas Kokkinos, Kevin Murphy, Alan L. Yuille, " DeepLab: Semantic Image Segmentation with Deep Convolutional Nets, Atrous Convolution, and Fully Connected CRFs", arXiv preprint, 2016. Weblink
- [2] Adam Paszke, Abhishek Chaurasia, Sangpil Kim, Eugenio Culurciello, " ENet: A Deep Neural Network Architecture for Real-Time Semantic Segmentation", arXiv preprint, 2016. Weblink
- [3] Andrew G. Howard, Menglong Zhu, Bo Chen, Dmitry Kalenichenko, Weijun Wang, Tobias Weyand, Marco Andreetto, Hartwig Adam, " MobileNets: Efficient Convolutional Neural Networks for Mobile Vision Applications ", arXiv preprint, 2017. Weblink
- [4] Github link with paper collection for embedded/mobile neural nets Github