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The conditional random field as a recurrent neural network (CRF-RNN) adds a conditional random field layer to a fully convolutional neural network (FCN-8) architecture [1]

Schematic visualization of the CRF-RNN network:

FCN → CRF-RNN

Coarse Predictions
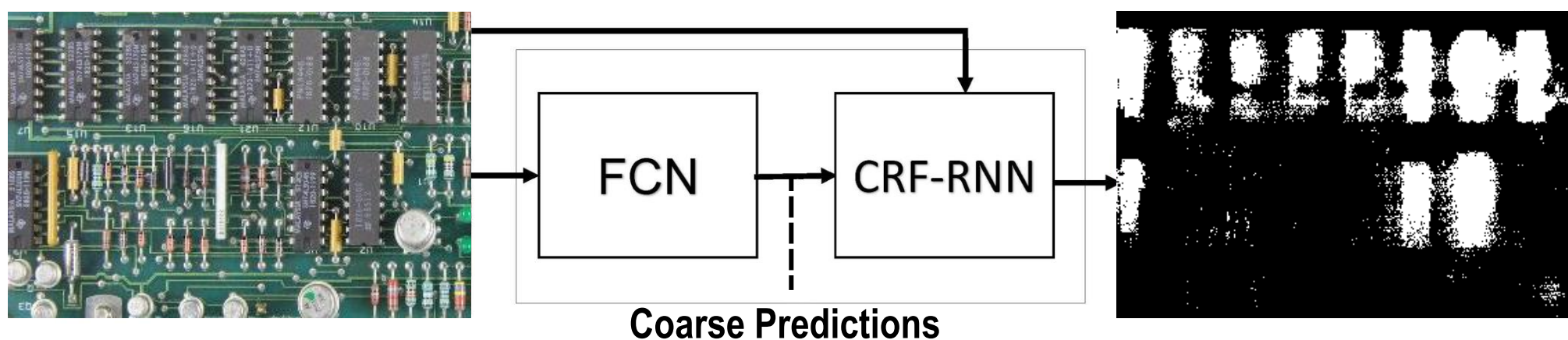
The CRF layer provides an image-dependent smoothing term, which encourages assigning similar labels to pixels with similar properties

The CRF-RNN network was trained end-to-end for 100,000 iterations using an NVIDIA GeForce GTX 980 GPU

FCN-8 Results
Pixel Accuracy:	0.8913
Frequency-weighted IU:	0.8265

CRF-RNN Results
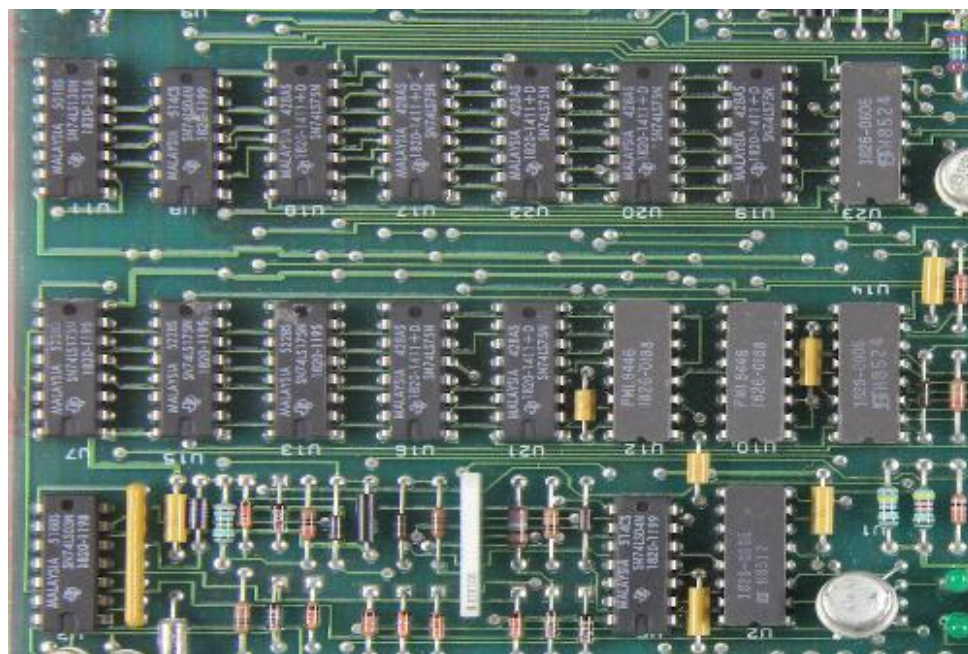|	
Pixel Accuracy:	0.9031
Frequency-weighted IU:	0.8464

Figure 1. Example Input Image

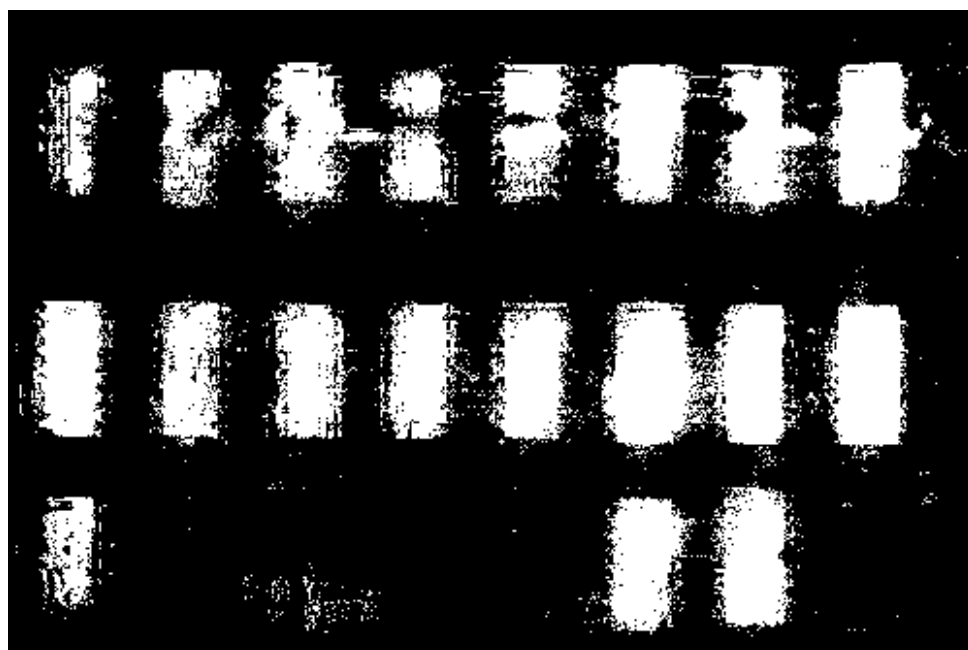Figure 2. FCN-8 semantic segmentation results

Figure 3. CRF-RNN semantic segmentation results

1. Zheng, Shuai, et al. "Conditional random fields as recurrent neural networks." *Proceedings of the IEEE International Conference on Computer Vision*. 2015.