Noise reduction for license plate reading

Application

This program illustrates how to use an image before and after noise addition to build a CogniMem chip capable of real-time filtering. The objective is to design a filter for noise removal to help decode license plate number on a highway.

Methodology

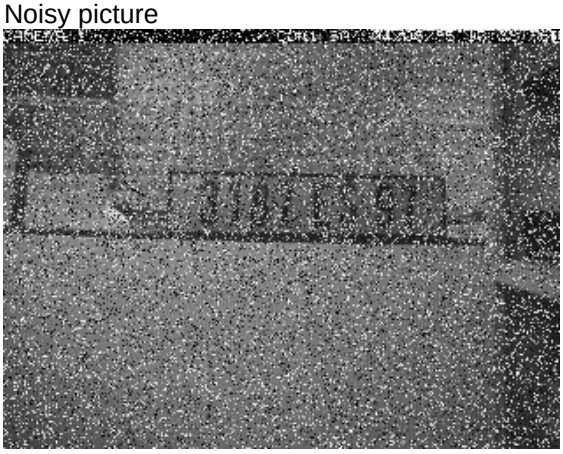
- **Learning phase:** The CogniMem training is performed using a good quality image called REF_IMAGE and its transform image after the addition of random noise that we will call NOISY_IMAGE. Each block of 5 x 5 pixels in NOISY_IMAGE is sent to the CogniMem with a category equal to the value of the central pixel of the 5 x 5 block in REF_IMAGE.

- **Recognition phase:** The program scans every block of 5 x 5 pixels in a new image. For each block, the CogniMem chip finds the best matching pattern and assigns its category, if identified, to the central pixel of the block. The output image appears noise free.

Results

This application was implemented by IBM Labs in Paris using 684 neurons.
The filtering of an image with 320 x 240 pixels and a region of interest of 5x5 pixels takes a half of second.

Noisy picture



After process (< 0.5 second)