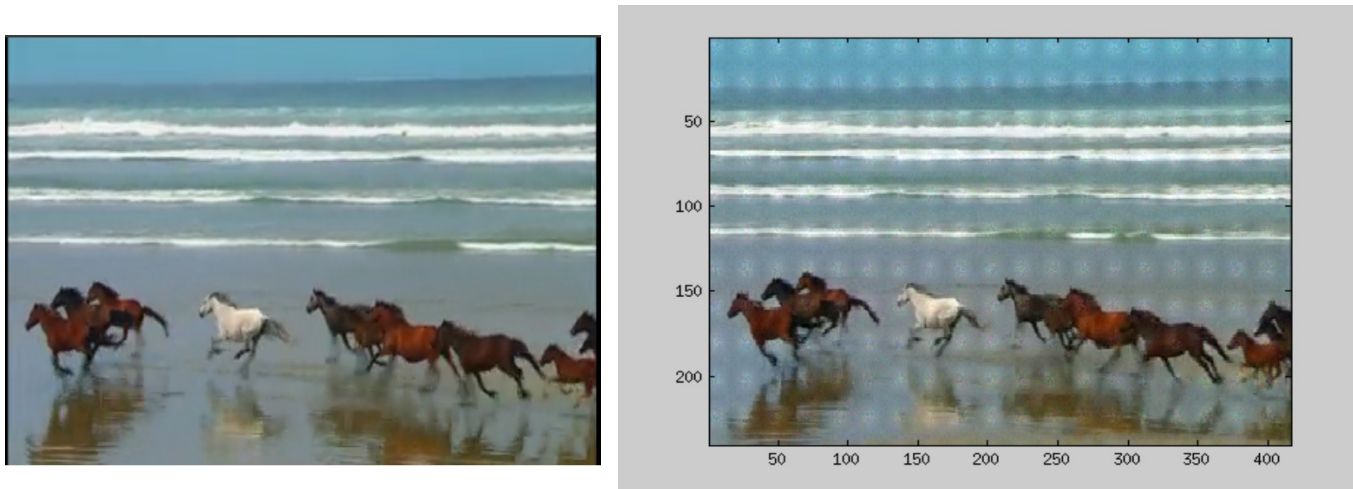


Midterm Exam

Statement of the Problem

A video has been corrupted with random and periodic time-varying noise using MATLAB. The video has a duration of 1 minute, each frame has a spatial resolution of 512x394 pixels/frame, and it was recorded at a rate of 15 frames/second. Figure 1 shows an uncorrupted and corrupted sample frames.



(a)

(b)

Figure 1. (a) Uncorrupted frame, (b) corrupted frame with time-varying noise superimposed on it.

Objectives

The objective is to develop a systematic method to clean the video using MATLAB (or C), as best as possible using the techniques discussed in the textbook, other texts, or the Internet.

Deliverables

A short report (<6 pages) containing the following information:

1. A brief description of the problem.- describe the problem from your point of view.
2. A detailed description of the/your method to remove the noise.- did you use one, or a combination of techniques to clear the image? You are not allowed to use canned routines in MATLAB Image Processing//Computer Vision Toolbox, unless you are developing a new technique.
3. Description of the techniques you used.- spatial- or frequency-based; linear or non-linear; time-varying or time-invariant filtering.
3. Summary of the results.- what technique worked, what did not work, and why? Include sample frames to support your statements.
4. Future work on this topic.- what other method you would have liked to try, had you had more time, or wanted to improve on the results.
5. Appendix.- include a listing of your commented MATLAB or C code.
6. References.