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LABORATORY #5

Input

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- Stereo Images
  - R.pgm L.pgm
  - Already rectified

Homework #1

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- Compute disparity
  - Use SAD approach
    - WxW window ⟶ W as command option
    - Limit search range as [0, 127]

Homework #1

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- Hints
  - On which row of the right image I have to search the correspondances?
  - Once the row is known, I have to move right or left to search?
  - We can use 5 nested cycles

V-Disparity

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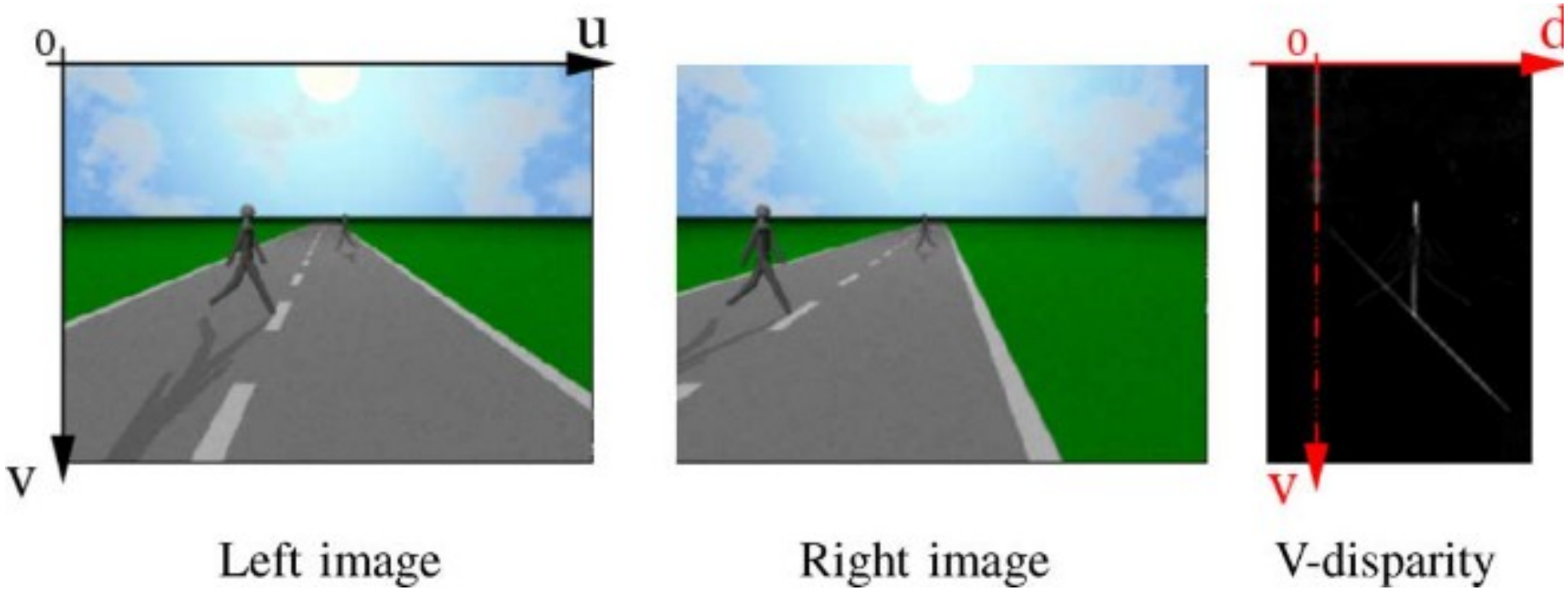
- V-Disparity is a “simplified” stereo match technique
  - Instead of matching pixel/patches we match an entire line with the same line on the other image using different offsets
  - The result is an histogram for each line
  - Namely a new image having
    - The same number of rows of origin images
    - A number of columns equal to the interval of considered offsets

V-Disparity



Left image

Right image

V-disparity

V-Disparity

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- In order to obtain V-Disparity we can:
  - Start from disparity ⟶ more precise
  - Pixel to pixel match ⟶ more fast
- Result can ve further processed to extract lines
  - Oblique line ⟶ “floor” plane
    - Image stabilization
  - Vertical segments ⟶ presence of obstacles

Homework #2

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- Given the result of Homework #1
  - Create a vdisp image having 128 columns and encodinf the V-Disparity of inout images
  - Use as function signature
    - void VDisparity(const cv::Mat & disp, cv::Mat & out)

Homework #3

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- Directly compute V-Disparity from input images
- Use a pixel – pixel match as
  - void V_Disparity(const cv::Mat &l, const cv::Mat &r, cv::Mat & out);