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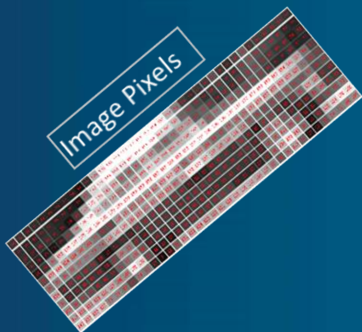
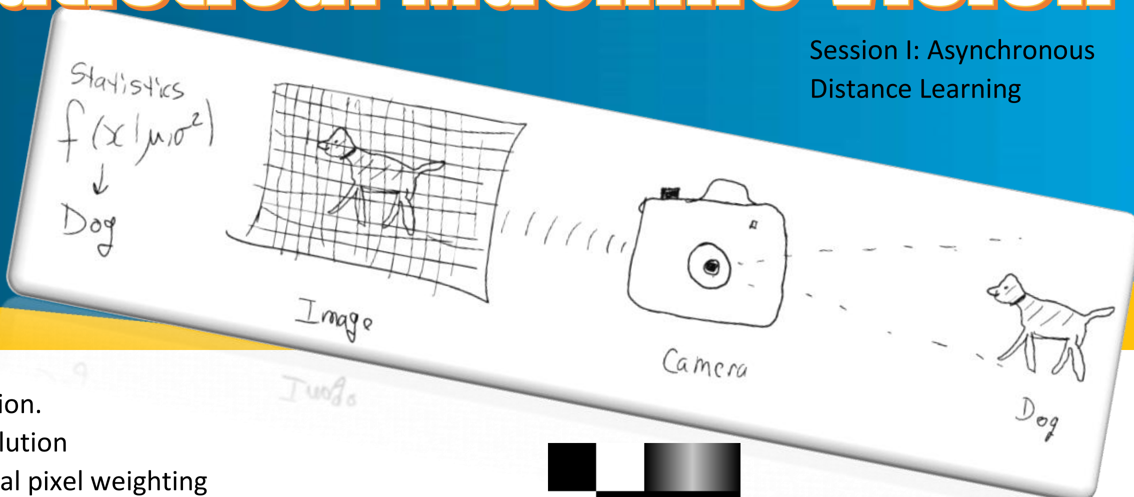
MATH 4770/MSSC 5770 – Summer 2026

Statistical Machine Vision

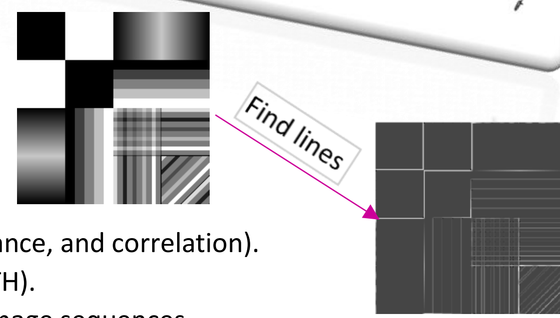
Session I: Asynchronous Distance Learning



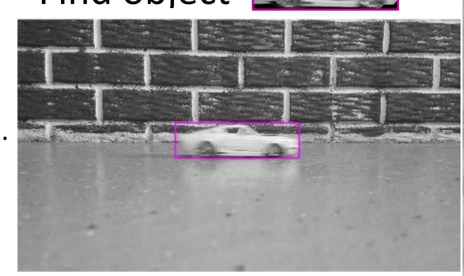


Topics:

- Discrete image representation.
- Time Series & Image Convolution
- Image enhancement via local pixel weighting (spatial kernel filter and image space convolution).
- Kerrnel filter design with weight assignments.
- Pixel noise reduction via local averaging (smoothing filters).
- Edge enhancement via local differencing (gradient filters).
- Statistical properties of local averaging or differencing (pixel mean, variance, and correlation).
- Image text recognition, letter or word identification (letter A, word MATH).
- Time averaging (temporal recursive filters) for pixel noise reduction in image sequences.
- Identifying and tracking of objects including orientation through a sequence of images (car moving across a scene in a sequence of images).
- The DFT for accelerated convolutions in frequency space
- Line tracing within an image via discrete derivatives, gradients, and Hessians.
- Image object representations (perimeter, area, elongation, etc.), feature extraction.
- Statistical classification of image objects using features (square, circle, and rectangle).
- Computational implementations and examples will be given with Matlab.
- Additional topics covered if time permitting.



Find object



Prerequisites/Notes:

- COSC 1010, MATH 1451, and MATH 4720 or the equiv.
- MSSC 5770 will have additional assignments.

For more information, email the instructor:

- Dr. Daniel Rowe (Daniel.Rowe@Marquette.Edu)

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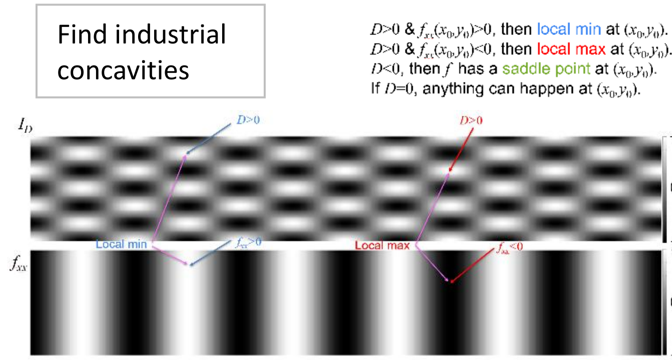

Find text

pictures

"If your pictures aren't good enough, you're not close enough."
– Robert Capa

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