

Class Information

MAI5020-5021 – Image Processing courses

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Instituto de Ciências Matemáticas e de Computação – USP

2023/1

Agenda

- 1 Course
 - Contents
- 2 History and typical image sources
 - Programming language
- 3 Grading
- 4 Contents repository

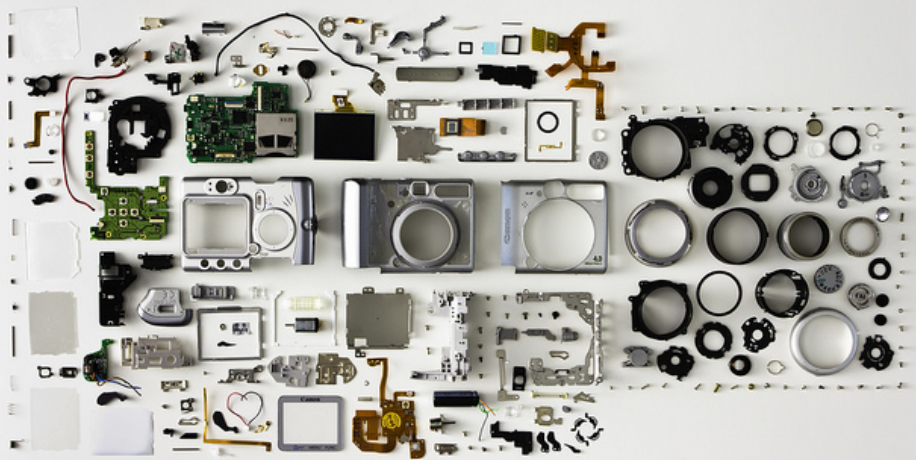
Contents

MAI-5020

- Image processing fundamentals: acquisition and modelling
- Gray-level transformations and image filtering
- Image enhancement
- Fourier Transform and frequency domain operations
- Image restoration

MAI-5021

- Colour images (*end of MAI5020)
- Mathematical morphology
- Image analysis: feature extraction and classification
- Image segmentation
- Convolutional neural networks



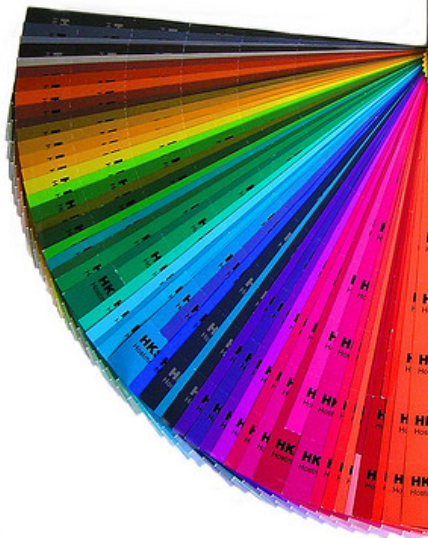
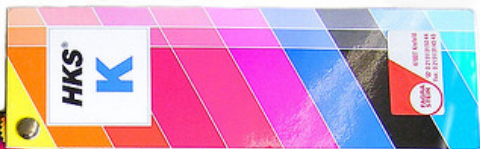




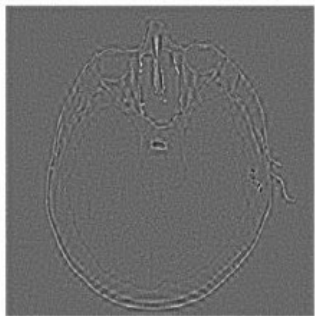
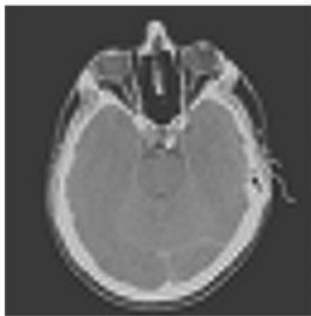
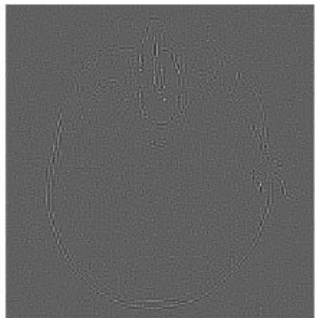
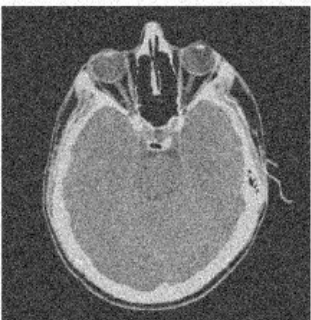


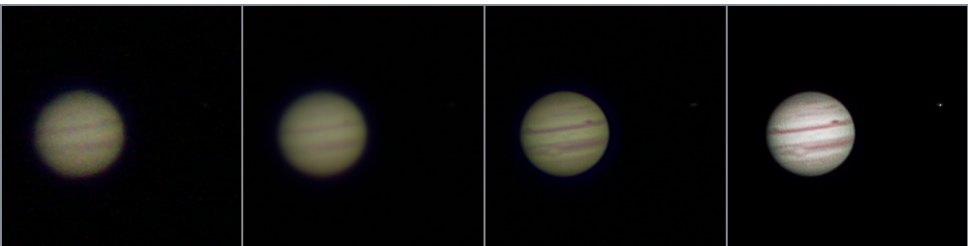


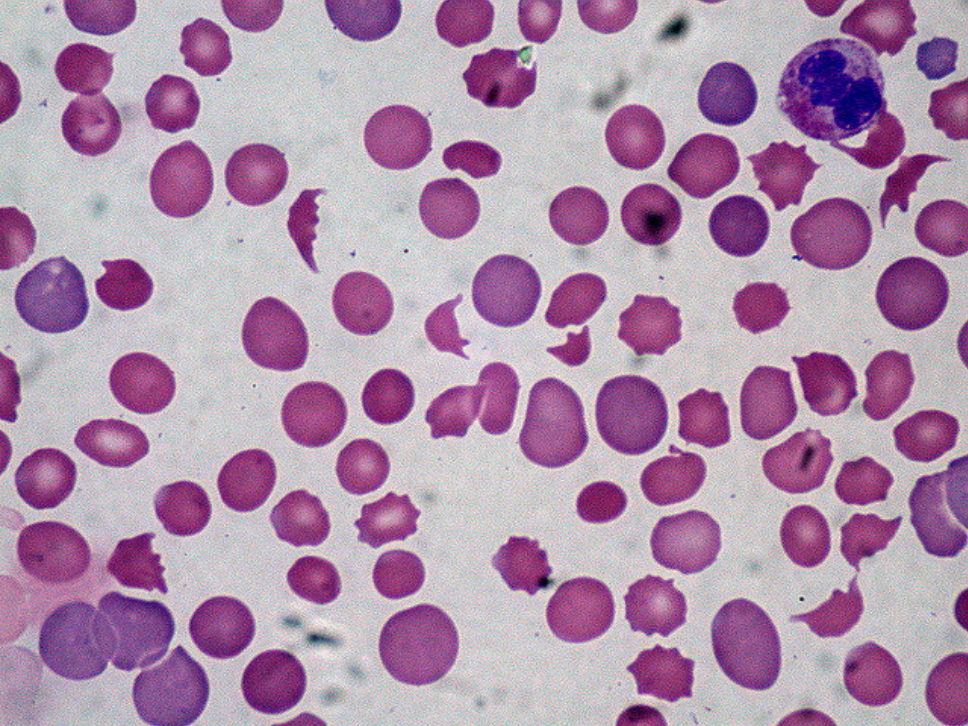




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Yellow-Orange	HKS 4 K	Hostmann-Steinberg
Orange	HKS 5 K	Hostmann-Steinberg
Orange-Red	HKS 6 K	Hostmann-Steinberg
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Red-Orange	HKS 8 K	Hostmann-Steinberg
Red	HKS 12	Hostmann-Steinberg
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MSD
MOTOROLA
MSD

OREGON
FRATEL

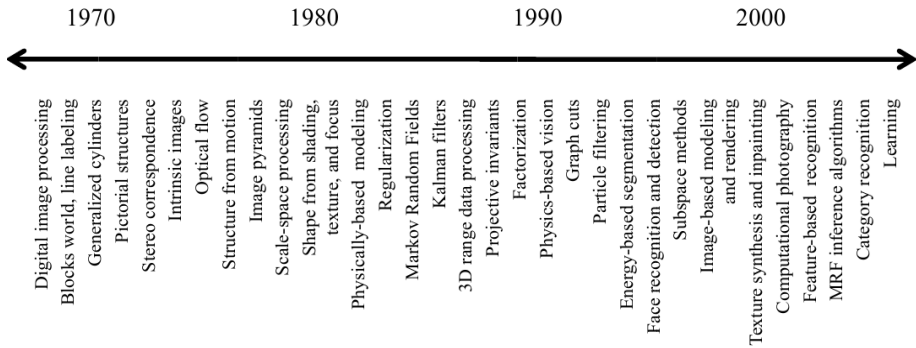
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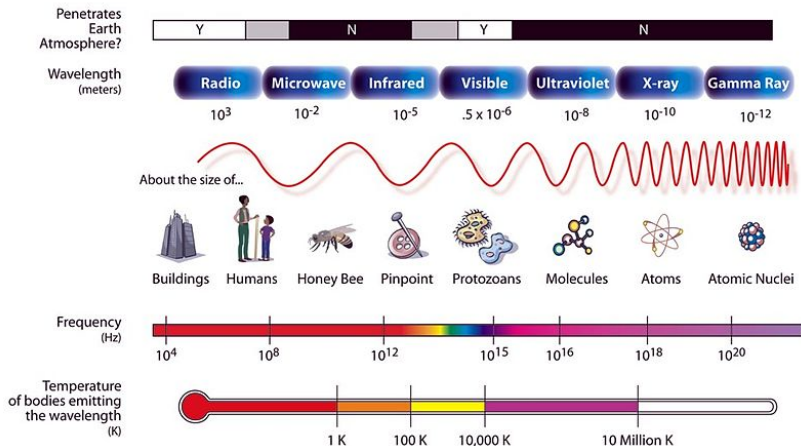
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History



Electromagnetic Spectrum

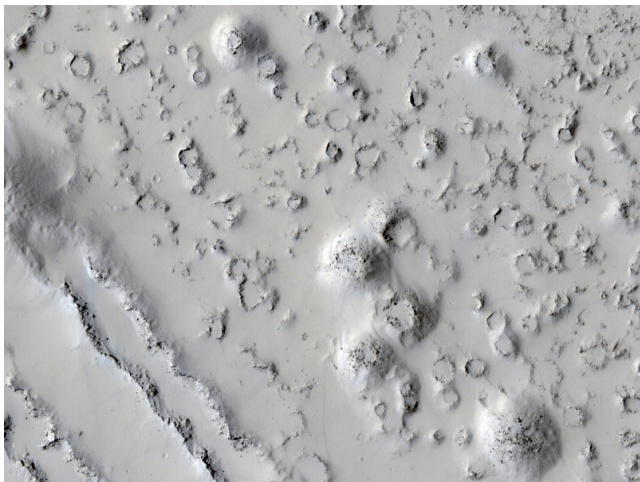
THE ELECTROMAGNETIC SPECTRUM



Natural images



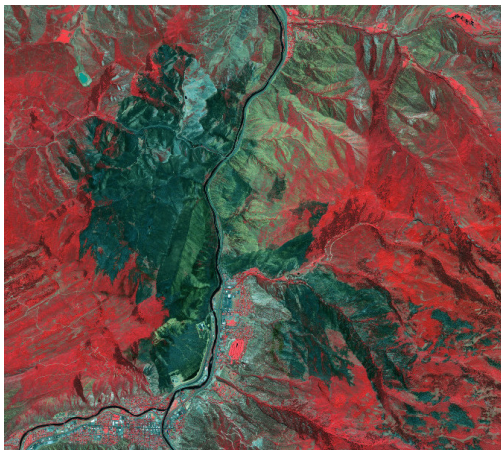
Scientific images



Medical imaging



Remote sensing



Programming language

- python with numpy, imageio, scipy.

Grading

- Exams for each module (Moodle/eDisciplinas) *E*
- Programming assignments (run.codes) *A*

Grading

Harmonic mean considering:

- The arithmetic mean within each grading item:

$$\frac{3}{\frac{1}{E+5} + \frac{2}{A+5}} - 5$$

Graduate course grades

- A: ≥ 8.5
- B: ≥ 7.5
- C: ≥ 5.0
- D: < 5.0

Grading

Assignments

- Developed ****individually**** using python + numpy, imageio, scipy. No other library is allowed.

Contents repository

Course contents, schedule, slides, announcements and quizzes

- <https://edisciplinas.usp.br>

Communication

- Discord (see link at the eDisciplinas page)

Bibliography I

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-  SZELISKI, R. **Computer Vision: algorithms and applications**
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http://szeliski.org/Book/drafts/SzeliskiBook_20100903_draft.pdf

