



Machine Vision and Intelligent Systems

Bin LI





Bin Li

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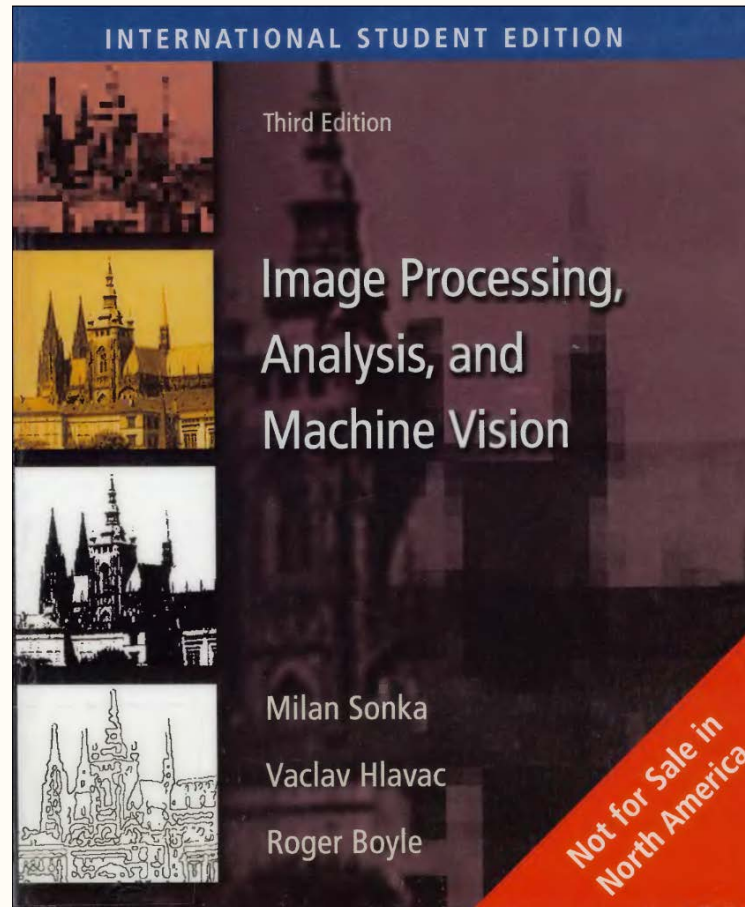
Details about the course

- **Course Title:** Machine Vision and Intelligent Systems
- **Course Credits:** 2 ; **Hours:** 32 ; **Semester:** No.2
- **Time:** 19:00 - , Wed. Evening
- **Classroom:** 320505
- **Classification:** Elective for graduate students
- **Prerequisite:** None
- **Instructor:** Bin Li (李彬)
- **Objective:** To learn machine vision and intelligent systems through extensive course projects



Textbook

- Sonka et al. “Image Processing Analysis, and Machine Vision,”
Third Edition. 2007.



Details about the course

- Other references

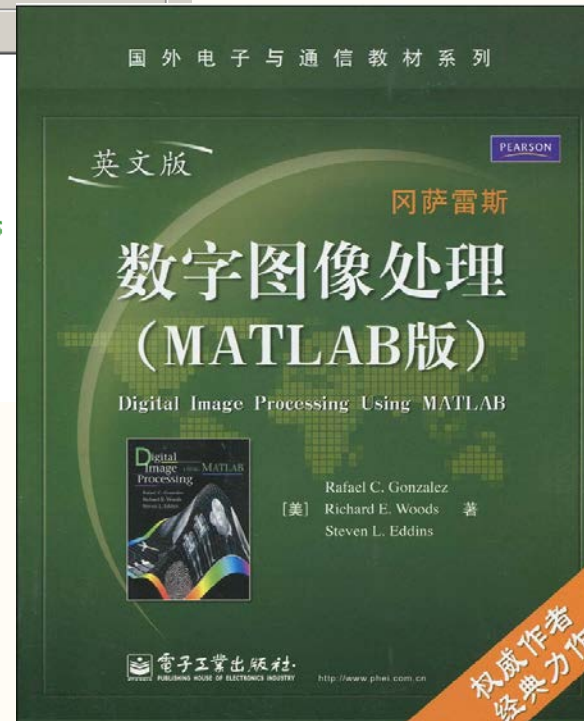
- Svoboda, **Image Processing, Analysis, and Machine Vision – A MATLAB Companion**

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File Edit Text Go Cell Tools Debug Desktop Window Help
1 % image_view_demo Demonstration of simple viewing of the image
2 % CMP Vision Algorithms, http://visionbook.felk.cvut.cz
3 % Vaclav Hlavac, 2007
4 %
5 % History:
6 % $Id: image_view_demo_decor.m 1088 2007-08-16 06:34:55Z svoboda $
7 %
8 % 2007-06-19 VH Written.
9 % 2007-06-29 VZ typo
10 % 2007-07-05 TS comments corrected
11 - clear all;
```

- Materials on web

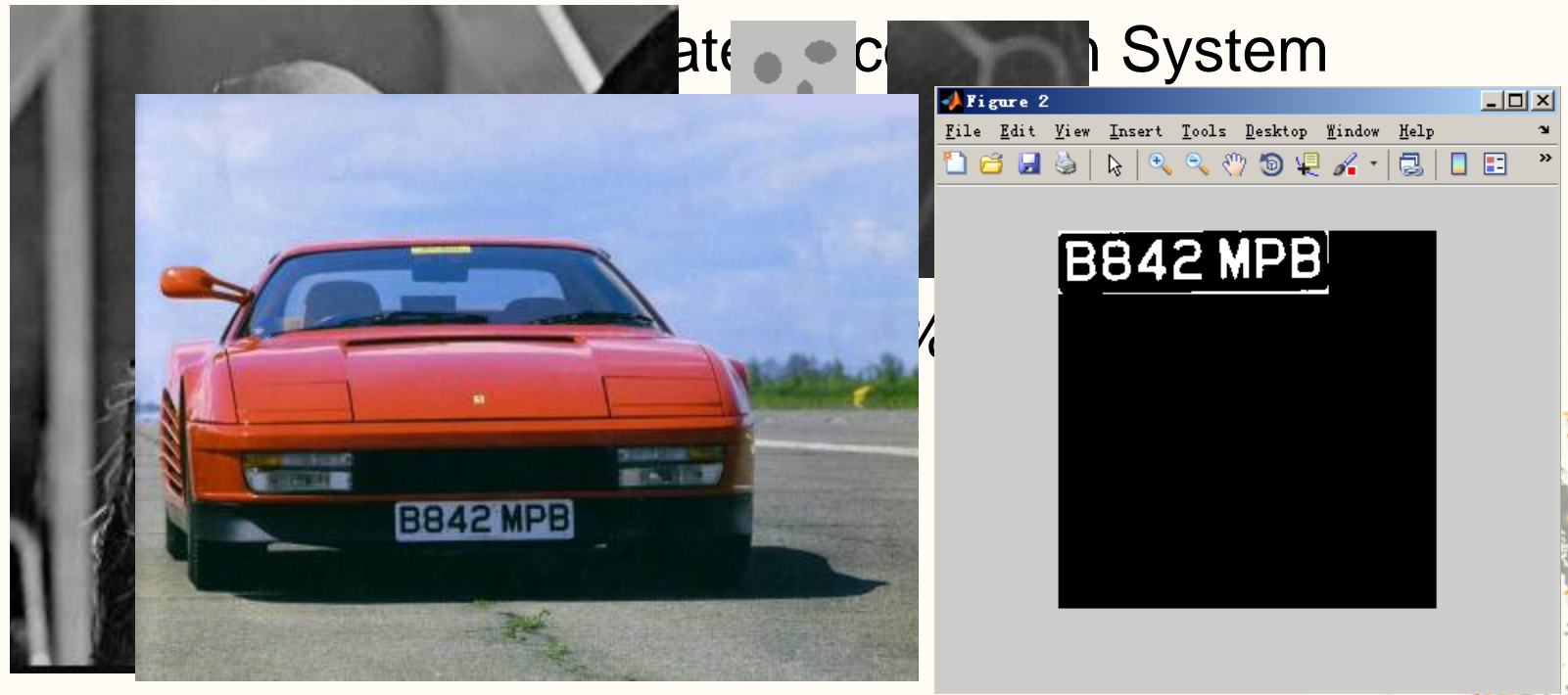
- Wiki, Opencv, ...

e processing



Course Arrangement

- Theory: 32 hours
- Project & Practice: 16 hours
 - Segmentation of Objects



Brief Arrangement of Course

Get a bird's eye view of ...



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Brief Arrangement

Teaching Content	Remarks
Chapter 1 Introduction	
Chapter 2 Digital Image Fundamentals	1)The image, its representations and properties 2)The image, its mathematical and physical background
Chapter 3 Image Pre-processing	1)Image enhancement in the spatial domain and rrequency Domain 2)Image restoration
Chapter 4 Image Segmentation	1)Image-data-driven segmentation method 2)Image-model-driven segmentation method 3) Mathematical Morphology
Chapter 5 Object Recognition	1)Pattern recognition system 2)Shape representation and description (Feature Selection) 3)Linear and nonlinear classifiers 4)Clustering
Chapter 6 Image understanding	1)Image understanding control strategies 2)Pattern recognition methods in image understanding
Chapter 7 3D Vision, Geometry	1)3D vision 2)3D reconstruction 3)Scientific visualization
Chapter 8 Motion analysis	1)Different motion analysis methods 2)Detection of specific motion patterns 3)Motion models to aid tracking
Project	1)Segmentation of Objects 2)Vehicle License Plate Recognition System

Some Important Journals

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Image Processing
- IEEE Transactions on Robotics and Automation
- IEEE Transactions on Systems, Man, and Cybernetics
- Computer Vision and Image Understanding
- CVGIP: Graphical Models and Image Processing
- International Journal of Computer Vision
- Pattern Recognition
- Image and Vision Computing
- Machine Vision and Applications



Some Important Conferences

- IEEE Conference on Computer Vision and Pattern Recognition
- Image Understanding Workshop
- International Conference on Computer Vision
- International Conference on Image Processing
- International Conference on Pattern Recognition
- SPIE (The International Society for Optical Engineering) Conferences



Some effective ways of literature search

- Library website of SCUT
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