

# EI412: Machine Vision and Application in Industry

## Thammasat University

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**Instructor:** Dr. Songyot Nakariyakul

**E-mail:** nsongyot@engr.tu.ac.th

**Office:** L 420-2

**Office hours:** Students are encouraged to contact the instructor via e-mail for quick questions regarding homework and course material.

**Web site:** <http://songyot.ece.engr.tu.ac.th/EI412/>

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### Course description:

Computer acquisition and analysis of image data with emphasis on techniques for robot vision. Image formation and image sensing. Image segmentation. Edge detection. Shape finding. Pattern recognition. Automated machine vision applied to assembly and inspection tasks in industry. This course is conducted using project-based learning approach.

### Very Tentative Schedule

Topic 1	Introduction
Topic 2	Digital Image Fundamentals
Topic 3	Image Enhancement
Topic 4	Color Image Processing
Topic 5	Morphological Image Processing
Topic 6	Image Segmentation
Topic 7	Corner and Circle Detection
Topic 8	Geometry
Topic 9	Pattern Recognition
Topic 10	Automated Visual Inspection

### Textbooks:

1. Rafael C. Gonzales and Richard E. Woods, Digital Image Processing, 4th Ed., Prentice-Hall, New Jersey, 2018.  
Book website: <http://www.imageprocessingplace.com/>
2. E.R. Davies, Computer & Machine Vision: Theory, Algorithms, Practicalities, 4th Ed., Academic Press, 2012.
3. Chris Solomon and Toby Breckon, Fundamentals of Digital Image Processing: a Practical Approach with Examples with MATLAB, John Wiley & Sons, 2011.  
Book website: <http://www.fundipbook.com>

**Grading:** 10% Attendance, 10% homework, 30% midterm, 50% project.

**Programming:** The best way to understand an algorithm is to program it. Students will have to complete individual assignments required in each homework assignment using MATLAB.

**Image Viewer Software:** [www.xnview.com](http://www.xnview.com)

**Homework Policy:** Discussion of material covered in class is strongly encouraged, but the homework you submit must be your own work. Copying and using another person's work is not allowed.