

ME6406 Machine Vision

(Updated)

General Information

Classroom: MRDC 2404

Professor Kok-Meng Lee <kokmeng.lee@me.gatech.edu>

Office hours: Tuesday and Thursday 2:00pm - 3:00pm (MaRC474)

GTA:

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Office hours: Monday 2pm to 3pm; Wednesday: 3pm to 4pm.

Location: MaRC 4th floor Lobby

Schedule of homework assignments and mid-terms

Reading materials

Guest Lectures

Matlab Primer: Image Processing Toolbox

Website for the recommended textbook

Digital Image Processing (3rd Edition) by Gonzalez and Woods,

<http://www.imageprocessingplace.com/index.htm>

Other useful links:

Computer assignments and Mid-terms

Homework Assignment #1 (Avaialbe in T-Square)

Due Sept. 8, 2016 (Thursday)

Homework Assignment #2 (Avaialbe in T-Square)

Due: Sept. 29, 2016 (Thursday)

October 10-11 (Fall Recess)

Mid-term 1 (October 13, 2016, Thursday)

Homework Assignment #3

Due Nov. 10, 2016 (Thursday)

Mid-term 2 (November 22, 2016, Thursday)

November 24-25 (Thanksgiving Holidays)

Homework Assignment #4

Due Dec. 1, 2016 (Thursday)

Reading Materials:

[Introduction to Machine Vision](#)

[Introduction to Matlab for Machine Vision](#)

1. [Lee, K-M. and D. Li, "Retroreflective Vision Sensing for Generic Part Presentation," *J. of Robotic Systems*, vol. 8, no. 1, pp. 55-73, February 1991.](#)
2. [Lee, K-M. and R. Blenis, "Design Concept and Prototype Development of a Flexible Integrated Vision System," *Journal of Robotic Systems*, 11\(5\), pp. 387-398, 1994.](#)
3. [Lee, K-M., "Design Concept of an Integrated Vision System for Cost-Effective Flexible Part-Feeding Applications," *ASME Journal of Engineering for Industry \(JEI\)*, vol. 116, pp. 421-428, November 1994.](#)
4. [Lee, K-M. and S. Janakiraman, "A Model-based Vision Algorithm for Real-Time Flexible Part-feeding and Assembly," Paper number: MS 92-211. *SME Applied Machine Vision Conf.*, June 1-4, 1992, Atlanta, GA.](#)
5. [Tsai, R. "A Versatile Camera Calibration Technique for High-accuracy 3D Machine Vision Metrology using Off-the-shelf TV Cameras and Lenses," *IEEE Trans. on Robotics and Automation*, Vol. 3, No.4, August 1987, Pg: 323- 344](#)
6. [Tsai, R.Y. and R.K.Lenz, Real time versatile robotics hand/eye calibration using 3D machine vision, Proceedings of the 1988 IEEE International Conference on Robotics and Automation, 24-29 April 1988, Vol.1, Pg: 554 - 561 \(Also in *IEEE TRANSACTIONS ON ROBOTICS AND AUTOMATION*, VOL. 5, NO. 3, JUNE 1989 "A New Technique for Fully Autonomous and Efficient 3D Robotics Hand/Eye Calibration"\)](#)
7. [Pose estimation and notes](#)
8. [Lee, K-M. and J. Downs, "Vision-guided Dynamic Part Pick-up Learning Algorithm," *CD-ROM Proc. of the 1997 IEEE/ASME Int. Conf. on Advanced Intelligent Mechatronics \(AIM'97\)*, Tokyo Japan, June 16-20, 1997, pp. 55-60.](#)
8. [Lee, K-M., J. Joni, and X. Yin, "Imaging and Motion Prediction for an Automated Live-Bird Transfer Process," Proceedings of the *ASME Dynamic Systems and Control Division-2000*, Nov. 5-10, Orlando, FL, vol. 1, pp. 181-188.](#)
9. [Lee, K.-M. W. Daley and Q. Li, "Artificial Color Contrast for Machine Vision and its Effects on Feature Detection," Proceedings of the 2005 IEEE/ASME International Conference on Advanced Intelligent Mechatronics \(AIM2005\), Monterey, California, USA, 24-28 July, 2005.](#)
10. [Li, Q. and K.-M. Lee, "Effects of Color Characterization on Computational Efficiency of Feature Detection with Live-object Handling Applications," Proceedings of the 2005 IEEE/ASME International Conference on Advanced Intelligent Mechatronics \(AIM2005\), Monterey, California, USA, 24-28 July, 2005.](#)

Revised version of combined Refs 10 and 11 can be found in

[Lee, K.-M.; Li, Q.; Daley, W, "Effects of Classification Methods on Color-Based Feature Detection With Food Processing Applications," *IEEE Trans. on Automation Science and Engineering*, V. 4, NO. 1, Jan. 2007 pages: 40-51.](#)

11. [Garner, H., K-M. Lee, and L. Guo, "Development of a Grating Interferometer with Application to HDD Servo-Track Writing," *ASME J. of Manufacturing Science and*](#)

[Engineering](#), August 2001, vol. 123, no. 3, pp. 445-452.

12. [Garner, H., M. Klement, and K-M. Lee, "Design and Analysis of an Absolute Non-Contact Orientation Sensor for Wrist Motion Control," *Proc. of the IEEE/ASME AIM'01*, July 8–11 2001, Como, Italy, pp. 69-74.](#)
 13. [Lee, K-M. and Y. Qian, "Development of a Flexible Intelligent Control for Target Pursuit," *ASME J. of Manufacturing Science and Engineering \(JMSE\)*, August 1998, vol. 120, pp. 640-647.](#)
 14. [Lee, K-M. and Y. Qian, "A Vision-Guided Fuzzy Logic Control System for Dynamic Pursuit of Moving Target," *Microprocessor and Microsystems*, Elsevier Science, 1998, 21, pp. 571-580.](#)
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Guest Lectures:

1. [Frequency domain filtering](#)- Shaohui Foong
 2. [Handout of Guest Lectures on Support Vector Machine](#) -Qiang Li
 3. [Guest lecture by Doug Britton](#)-Applied Machine Vision
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Other useful links:

[Internet Reference for Matlab Tutorials](#)
[CVonline](#)
[Matlab Digest](#)
[Charge-Coupled Device Image Sensors](#)

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