

WORCESTER POLYTECHNIC INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

HOMEWORK – CHAPTER 06

COURSE No.: ME-593N, Fall 2000
COURSE NAME: Laser Metrology and Nondestructive Testing (NDT)
<http://www.wpi.edu/~cfurlong/ME-593N>
DATE: 18 October 2000
DUE: 25 October 2000

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NOTE: In all solutions, state explicitly every assumption and/or approximation made, explain every procedure, and justify its use. Dimensional analyses are absolutely necessary. All results must be expressed in appropriate units. PLEASE, ALWAYS SHOW ALL WORK, while writing your results only on one side of the sheet(s) of paper; start each problem on a new sheet. *Attach this sheet to your solution. Show your work using a clear and professional style.*

PROBLEM 6.1. On the website for this course (Chapter 6) there are two 16-bit images available. These images are in the RTI format. Write a computer program to read the image information contained in both images. Scale the 16-bit data into 8-bit and write a displayable image in a *standard* format (i.e. PGM binary or text, TIFF, BMP.)

You can find hints and information about RTI images on the website. Along with your results, please provide hard and soft copies of your software (as well as any compilation and linking instructions).

PROBLEM 6.2. Refer to Problem 6.1. Modify your computer program and add the capability to extract statistical information from 16-bit RTI images (mean and standard deviation information are sufficient). Test your new program with the same two 16-bit images provided.

Along with your results, please provide hard and soft copies of your software (as well as any compilation and linking instructions).

PROBLEM 6.3. Modify and update your project proposal to reflect:

- 1) Schedule for completion of the project
- 2) Add results of your preliminary investigations – as progress report

Please provide hard copy of your updated proposal.

READING 6.1. Chapter 7 (handout) from: C. Furlong, *Hybrid, experimental and computational, approach for the efficient study and optimization of mechanical and electro-mechanical components*, Center for Holographic Studies and Laser micro-mechaTronics, Worcester Polytechnic Institute, Mechanical Engineering Department, Worcester, MA, 1999.
