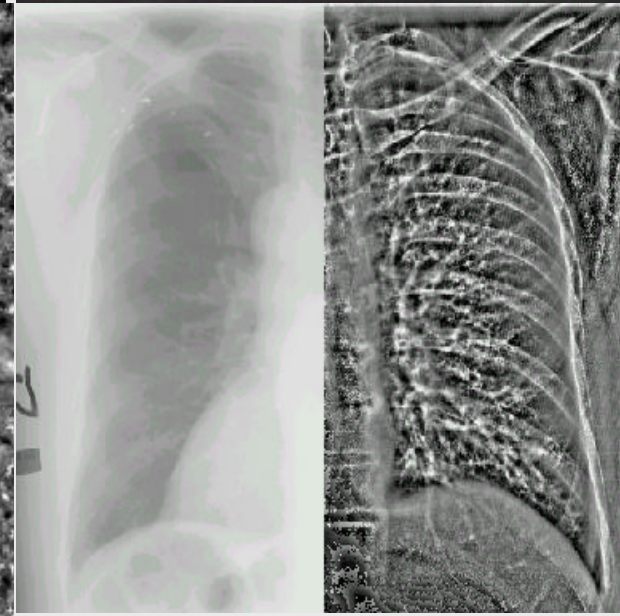
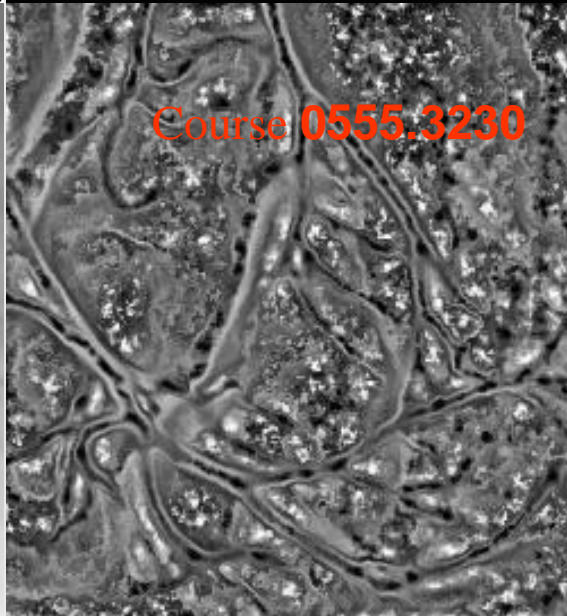
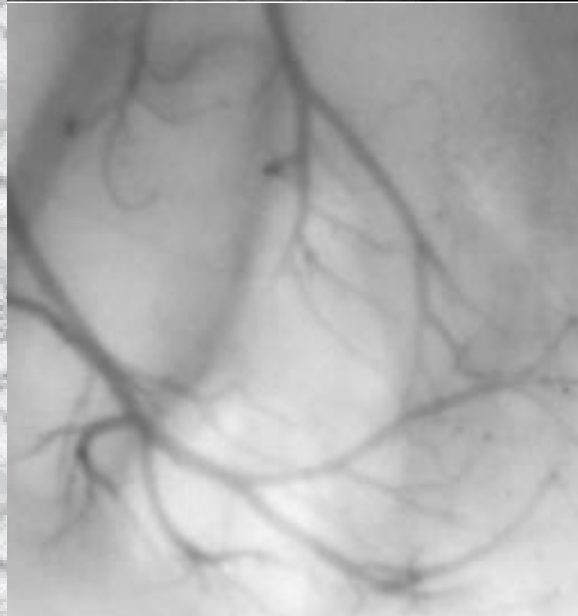
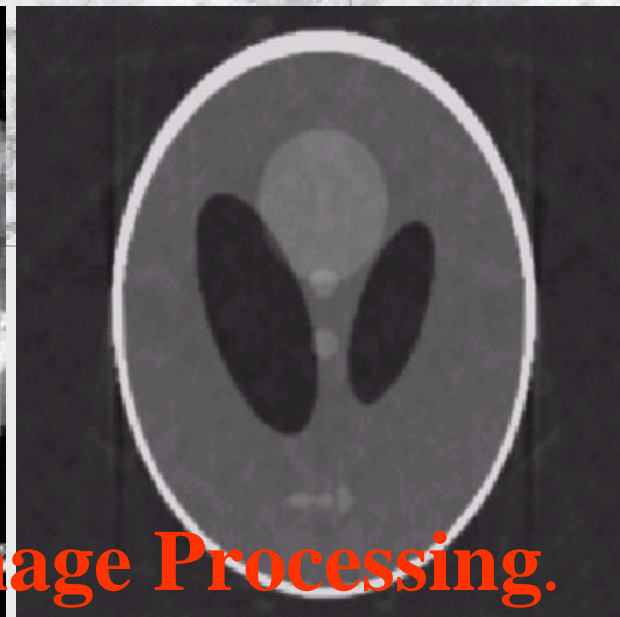
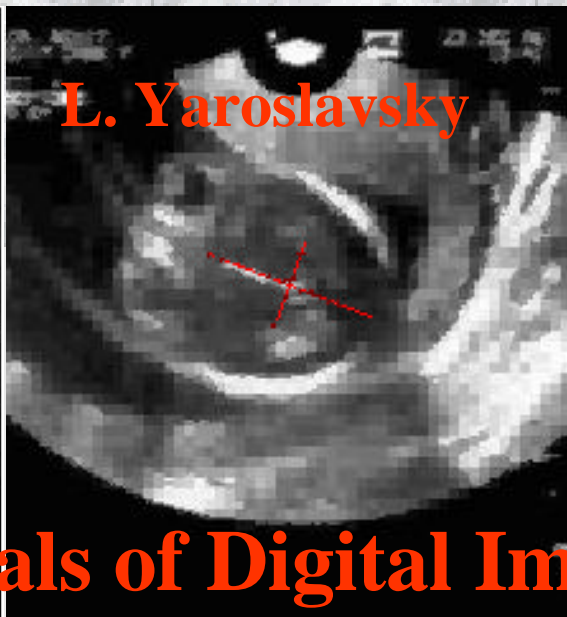
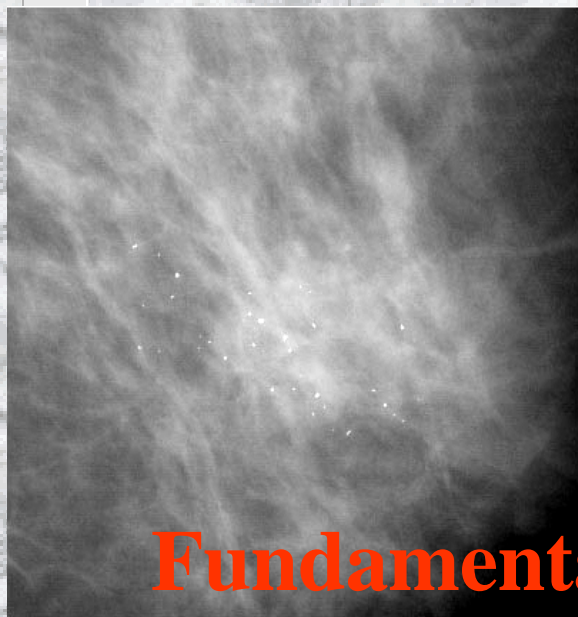


L. Yaroslavsky

Fundamentals of Digital Image Processing.

Course 0555.3230



What is image processing?

MURPHY'S HANDY GUIDE TO MODERN SCIENCE:

- If it's green or it wriggles, it's biology
- If it stinks, it's chemistry
- If it doesn't work, it's physics
- To err is human, but to really fool things requires a computer

DIGITAL IMAGE PROCESSING: solving a "GIGO" problem



Main tasks of image processing:

- **Image formation (reconstruction)**
- **Correcting sensors; signal calibration, standardization; image restoration**
- **Measuring quantitative data and signal detection and parameter estimation**
- **Interactive image processing (Image preparation and enhancement. Computer Aided Diagnosis)**
- **Automated signal and image analysis and understanding**
- **Image data compression for archiving and Transmission**
- **Image data mining.**
- **Mathematical simulation**

Course syllabus

Introduction to Digital Image Processing: imaging systems, image processing problems and applications. Elements of signal theory and of two-dimensional signal processing: signal space, signal representation, signal transforms, transforms in imaging. Image discretization and reconstruction. Image quantization. Image compression. Image filtering and restoration. Image enhancement. Image sequence analysis. Introduction to medical image processing and analysis. Computer Aided Diagnosis (CAD).

References

- L. Yaroslavsky, Lecture notes: <http://www.eng.tau.ac.il/~yaro/LectureNotes>
- Lecture notes "Digital Image Processing" by M. Elad (available over the Web)
- Digital Image Processing, R. C. Gonzalez and R. E. Woods, Addison-Wesley Publishing Company, 1993 or 2002
- L. Yaroslavsky, Fundamentals of Digital Optics, Birkhauser, Boston, 1996