

IST 562 Theoretical Foundations for Information Science
Penn State University Park

Programming Assignment 2: Fourier Transform
Due in about two weeks

You are given two X-ray scans of painting canvases. In this exercise, design and implement a *simple* method using the Fourier transform to count the canvas thread at any given location in the image. You can use a language of your choice (including high-level languages like Matlab, Octave, or Scilab). Represent the results as super-imposed color images (e.g., in PPM format). If the thread count at a location is higher than average, use a red-tinted color at that location. Similarly, if the count at a location is lower than average, use a blue-tinted color at that location. The X-rays are digitized at 600dpi (dots per inch). The thread count is typically taken for 2cm by 2cm patches.

Total points 100:

Correctness: 30 points

Functionality: 50 points

Documentation: 20 points

You can upload your program to the CANVAS drop box. Please include a short document with some examples of executing the program.

Read the Forbes article on a similar undergraduate project done at Cornell.
How to Spot a Fake, Forbes magazine online, December 3, 2008.

http://www.forbes.com/2008/12/03/collecting-forgery-art-forbeslife-cx_sf_1203fake.html



Thread Count Automation Project at Cornell University; X-ray courtesy of the Van Gogh Museum; weave density overlay Rice University.



Sizing Up

Van Gogh's "Portrait of an Old Man with a Beard" as seen by Cornell University professor Rick Johnson's canvas thread count software. The software relies on an X-ray of the painting. It measures the overall thread count in the painting's underlying canvas (vertical and horizontal). Then it marks off areas where the thread spacing deviates from the average. Thus the canvas in any newly discovered painting can be compared to those the artist was known to use. A mismatch can indicate a possible phony.