

**CDS 301 Spring 2013**  
**Scientific Information and Data Visualization**

**Homework Assignment 2**

**Assignment Date: February 12, 2013**

**Due Date: February 05, 2013**

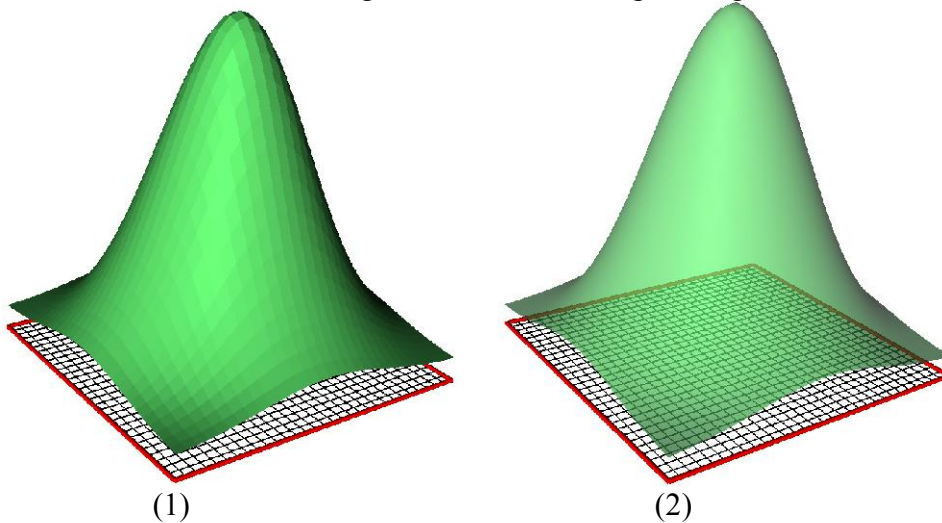
**Visualization of the Gaussian Surface in 3-D in Matlab**

The purpose of this homework is to learn the concept of the visualization process, including the data sampling, mapping and rendering. The implementation is to use the Matlab program.

The 2-D Gaussian function is defined as

$$f(x, y) = e^{-(x^2+y^2)}$$

You are asked to use Matlab to generate the following two figures:



Both figures have the same data mapping, but they are rendered in different way. While the Figure (1) has flat shading, Figure (2) has smooth or Gouraud shading with half transparency. In the program, you need to specify your domain size, the sampling numbers, the color, the position of the light, and the lighting type. You need to render the overlap of two objects: the Gaussian surface and the grid in the same Figure. Your final plots should be very similar to the images shown above, but not necessarily exactly the same.

**Submission: electronic submission only.** You need to submit two files: (1) a WORD document that contains the two images rendered, and a short description of the images and the rendering method, (2) the actual Matlab program "your\_program\_name.m" that is ready to be run and free of errors.

Note: a prototype Matlab program is provided for your reference.