

# SGN-84007 Introduction to Matlab

Exercise Set 7: October 11–14, 2016

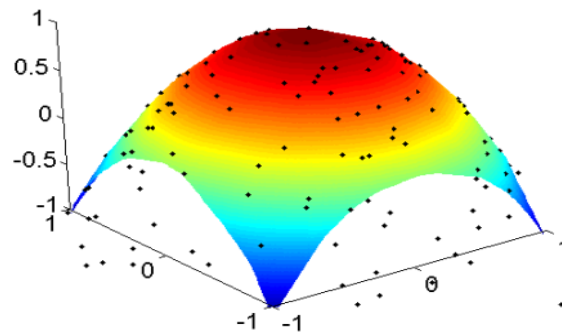
Exercises/pages refer to Hahn&Valentine: Essential Matlab for Engineers and Scientists (5th Edition)

1. Load a set of scattered 3D data from the address

[http://www.cs.tut.fi/courses/SGN-84007/Exer7\\_Data.zip](http://www.cs.tut.fi/courses/SGN-84007/Exer7_Data.zip)

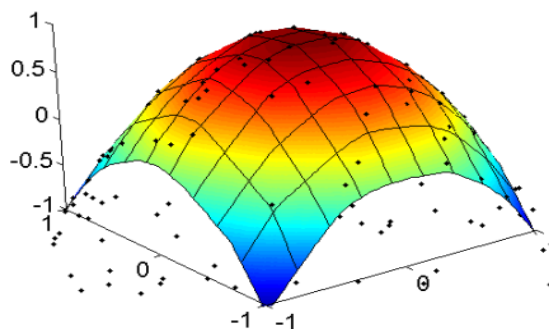
Extract the data and plot using the function `plot3`. Try also the function `scatter3`. Which one is better? Try to roll the plot around. Can you see the shape of the point cloud?

- 2–3. Find the slides from set 4 entitled *Surfaces from irregularly sampled data*. The slides describe how scattered data like in task 1 can be interpolated to form a surface like the one shown below.



Prepare a similar plot for the data of task 1. However, use the function `scatteredInterpolant` instead of the obsolete `TriScatteredInterp`.

4. Draw also a grid on top of the surface of task 2–3, such as in the below figure.



5. Load a set of 3D vector data from the address

[http://www.cs.tut.fi/courses/SGN-84007/Quiver3\\_Data.zip](http://www.cs.tut.fi/courses/SGN-84007/Quiver3_Data.zip)

The mat file contains 6 variables:  $x$ ,  $y$  and  $z$  are coordinates in 3D, and  $u$ ,  $v$  and  $w$  define vector fields at those locations. Plot a figure like the one below using `quiver3`.

