

## Engineering Geodesy I HS 2009

### Exercise 1: Sensor Measurements

#### Task:

- measure the multipath-distance to the ceiling using 2 ultrasound sensors
- perform continuous real time tracking of the ceiling distance and visualize the stability in a graph (time series of 100 measurements)
- plot & publish your measured data using a [wikifarm](#) for online publication
- create your own 2D positioning system

**Motivation:** A major task in Engineering Geodesy is real-time monitoring of the surveyed objects. Learn to establish data connection with a sensor to your PC and plot the data based on your own program.

1. Follow the quick instructions 'Schnellanleitungen & Tipps' or from [http://www.geometh-data.ethz.ch/student/eg1/2009/01\\_sensors/index.htm](http://www.geometh-data.ethz.ch/student/eg1/2009/01_sensors/index.htm) and set up the sensor system. This step shows you how to use a terminal program (hyperterminal) and enable data transfer.

2. Close the hyperterminal and use the Matlab program "cricketcom.m" to obtain data.

3. Make changes to cricketcom.m:

- a) change loop to 100
- b) view a graph of the measured distances (by uncommenting plot)
- c) print and plot only the data from your own cricket (from ID-number)
- c) store distances in an ascii-file and the graph as a jpg.

4. Online publication: Publish the results (distances, the plot and brief description) online using the provided wiki in your group folder. The Wiki at "Engineering Geodesy" can be accessed under the website: <http://elbanet.ethz.ch/wikifarm/eg/>  
The password is "geometh". Each group has its own group folder, which can be further subdivided. Multiple users can work simultaneously. Structure your site so that the others can intuitively understand and continue your work.

**Advice:** Don't worry. Remember that problems with hardware, software and interfaces are natural.