Lecturer:
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Matlab Course
WiSe18/19

Tutor:
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Computing
Final Matlab Project, Winter Semester 18/19
Option 2: Plot Any Data

29 & 30.11.2018

Please read through this Project description thoroughly and follow the formal and substantial requirements faithfully. It is relevant to your grade.

Create a Matlab Program that will automatically create a template to plot or visualize a data set with a selectable look and feel for similar data sets.

As physicists you often want (or need) to present a plot of some datasets. When you want to publish them (e.g. in a thesis, presentation, scientific publication) they should have the same look and feel, so that everyone in your target group can concentrate on the content and not on the inconsistencies. Sometimes you have put a lot of effort into your plots and when you want to show them in a presentation, you realize that either the font is to small or the colors are difficult to distinguish. When you work on a template and not on the real data, you can just recreate the plots you want with very little time and effort, even for a huge number of plots.

Create this template creator in Matlab with the following features and functionalities

- The program should be able to load (import) any kind of (x,y) data (advanced: maybe also (x,y,z) or (x,y,z,t)) data) either automatically or semi automatically (user interacts with a sample file and defines where the header stops and where the real data begins/ends.)
- All of the important parameters (color or not, linewidth, axis labels, ticks, font sizes, legend (content and position), . . .) should be adjustable in an easy and intuitive way.
- Easy embedded data fitting or the connection to Matlabs *curve fitting toolbox*.
- The created plots should be automatically saved in a desired folder as *.fig files and/or a format of the users choice (e.g. *.png, *.bmp, *.pdf, . . .).
- You should be able to save your template files for later use or modification.
- The program should be able to load the data content of e.g. a whole directory and create as well as save individual plots or joint plots using a previously created template.

- The creation of a graphical user interface is desired (it may also make your life easier).
- Make sure, that your program will work with a variety of completely different data sets and not just your own example data set.

Formal Requirements

- *The deadline to choose your group project will be Thursday the 20th of December 2018, 4 pm. If you do not choose a project by this day, you will drop out of the course. You will not get a grade for the lecture Introduction to Matlab , but also not a* failed. *If you select a project by this deadline, it is equivalent to registering for the exam in Matlab. If you then do not submit a programming project or do not participate in the colloquium, the course will be considered as failed.*
- *But you can change to some other project until the 7th of January 2019, 4 pm. After this deadline changing of the project is no longer possible.*
- *The deadline to upload your group project to StudIP will be the 17th of January 2019, 8 pm!* ***Absolutely no upload after the deadline will be accepted, regardless of the reason.***
- *Hint: You can upload earlier versions of the project work to StudIP. Your latest upload will be taken as your contribution. In this way, you have handed in your project work even if there is any problem at the end of the upload deadline.*
- *Please make sure that your Matlab code is executable under the Matab version used in the course and that it works correctly. This course uses Matlab version 2017b.*
- *Upload all files which are relevant to the project (.m file, .fig file, .mat file, data files, example files, the exported GUI file if a GUI was created etc.) and the published code to your group's Stud.IP folder. The compression of the data as *.zip file is desired.*
- *Follow the naming convention as they are provided in the Lecture Slides for the very first lecture.*
- *A good documentation* ***(published code and comments)*** *are essential for a good grade.*
- *Include a reference to all sources used in this project, where 3 or more lines of code were used (e.g. in the published code)*
- *Plagiarism will be taken very seriously and appropriate action will be taken if it is discovered that code was copied without referencing or if code was copied from another group.*
- *There will be a oral colloquium about your programming work and MATLAB essentials at the end of the lecture period. Four dates have been reserved for the colloquium. Please check your emails to find out when your colloquium will take place.*
- *The best grades will be provided for creative solutions, elegant programming, fast code, and extra features which go beyond the listed minimum project specifications.*

Have fun and good luck!