What is R and what can we do with it?

September 21, 2017

R introduction

- R is a free software environment for statistical computing and graphics.
- It runs on a wide variety of UNIX platforms, Windows and MacOS.
- R is open source and actively developed - lots of free stuff to use
- R is a programming language

```
x <- 10
y <- x * 2

v <- c(3.14, 2, 90)

data <- tibble(
    x = c(1,2,3,4)
    y = x^2
  )
```

How do you learn programming?

I will point out some good ressources later.

R and RStudio

R formats

- R can be used to output to many different formats
- Write everything in plain text and decide how to share it later

Examples | R script for general analysis

Loading and plotting UV-Vis data (see `examples/R_simple_example.R`)

```
library(tidyverse)

path = "data/"

data <- tibble(files = list.files(path, pattern = "*.csv"))
  mutate(data = map(paste0(path,files), read_delim, delim =
```

Examples | Lab journal in R Markdown

emiltb.github.io/graphene-production/

Examples | R packages for reusing code

- The Comprensive R Archive Network (CRAN) has more than 11.000 packages
- Even more packages in development on Github
- We can make our own package for the group
  - Shared functions for loading data (electrochemistry, XPS, Raman etc.)
  - Plots with a unified look
  - Easier collaboration by keeping data and scripts in a common place

Questions and discussion

How does this fit into your work and could you see yourself working with this?

What should we study

How should we organize the study group so that everyone can benefit?

Topics

- Loading and cleaning data
- Plotting using ggplot2
- Reusing code in a package

Communication

When working with R you might quickly end up having brief questions for other people – where to ask those?

We could use Slack! http://bit.ly/2ysN7F5

Getting started with R on your own computer

We can try to get R and RStudio up and running on everyones computers and run some basic examples.

Download R: R-project.org > Download > Choose a Mirror > Choose your OS

Download RStudio: rstudio.com > Download Free RStudio Desktop > Find your OS

Install both and once you have RStudio open, try to run a few commands.

```
x <- seq(1, 100, by = 1)
y <- x^2
plot(x,y)
```

Install the package `tidyverse`

Also - the link to Slack: http://bit.ly/2ysN7F5