Hall GUI Documentation (Supplementary)

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1 Introduction

This short supplementary document was made to accompany the GUI used to operate a Hall measurement device and Elliot Wadge's documentation for it. Contained in the GUI are a set of controls for making Van der Pauw measurements. The device takes a specified number of voltage measurements at multiple current levels and repeats this 8 times across the different switch combinations. Using the data obtained, the program fits 8 different voltage vs current lines using np.polyfit() of the first degree. The results calculated from the slopes are then displayed as well as the R-squared values of the fitted lines.

This document serves only to outline some procedures for working with and updating the Hall GUI code, as the only things I personally worked on were creating a new repository, adding the code to the new lab computer account, and updating the directories. (I never got to measure any samples using the device, though we did check to make sure the updated file saving directory was working.) See Elliot's documentation for the details and specifics about the code. The latest version of the code can be found at `https://github.com/AlistairBevan/Hall/tree/mocvd-updates`. Note that there are two branches; "mocvd-updates" is the most recent branch. (The new account on the lab computer is "mocvd".)

I apologise in advance if there are any errors in this document or issues with the modifications I made in the code. If you have any questions about the code or this document, please feel free to contact me at awb5@sfu.ca.

2 GitHub

Elliot's GUI code is available on GitHub at `https://github.com/Elliot-Wadge/Hall-GUI`, while my forked version is at `https://github.com/AlistairBevan/Hall`. This section outlines the procedure for cloning the git repository to the new lab computer account, and syncing the local repository (on the lab computer) with the remote repository (on GitHub). I am by no means a pro at using GitHub, so these are just one set of instructions to get to the desired results; they may not be the most efficient or best methods.

2.1 Installation

Let's walk through the procedure for installing the git repository on your device.

1. If git is not installed, get it from `https://git-scm.com/downloads`. (To check if it's installed, you can type `git` in a Command Prompt window.)
2. Go to the location on your computer you would like the repository to be in, right-click and select "Git Bash Here". It may look slightly different and you may need to click "Show more options" to see it.
3. Type `git clone -b branch-name https://github.com/AlistairBevan/Hall.git` to clone the repository. Replace "branch-name" with the branch you would like to be on. For instance, mocvd-updates is the most up-to-date branch.
4. To run the program, ensure PyQt5, PyQtChart, numpy, and PyVisa are also installed (e.g. you can type `pip install numpy` in the Command Prompt and it will install).

2.2 Update the Code

The following instructions can be used to bring the code up to date with what is on GitHub. Note that it's best to avoid making code changes in your local repository without being signed into a GitHub account that is able to modify the code. This should ensure smooth pushing and pulling of changes.

1. Open the local repository folder (named "Hall"), right-click, and select "Git Bash Here."
2. Check that you are on the correct branch by typing `git branch`. To switch branches, type `git checkout branch-name`.
3. To update your local repository with the latest changes, type `git pull`.

2.3 Visual Studio Code

For working on the code, I used Visual Studio Code (VSCode) which is a popular and versatile code editor developed by Microsoft and can be downloaded from `https://code.visualstudio.com/`. The only extensions needed to work with the GUI are "Python" and "GitHub Pull Requests and Issues", which are relatively easy to find in the Extensions tab. To run the GUI, open the GUI.py file and then hit "Run Python File" in VSCode. (There should be a button for this, with an arrow icon, at the top right hand corner of the window.)

3 Modifications

The only change I made to the files was changing a couple of the directories to work with the new lab computer account. Everything else remains the same as Elliot's latest version of the code.

3.1 Directories

The directories in line 119 of GUI-main.py and line 363 of custom-widgets.py were changed so that the user is "mocvd". The way the code is currently set up, it would need to be modified here to work properly if the user is not mocvd.