Philosophy and history of science with computational means, Prof. Dr. Gerd Graßhoff

Sommersemester 2020, Humboldt Universität

Course Units

1. Subject and organization (23. April 2020)
    a. Motivation
        i. Philosophy
        ii. History
        iii. Science
        iv. Computational means
    b. Objectives
        i. Scientific view:
            1. Arena of science: Understand your teaching directory as the public arena of scientific discourse. All your contributions are shown to others. All peers of this arena (all who have access) can view, respond and reuse your contributions. The teaching directory is our WORLD OF SCIENCE for the time of this course/seminar.
            2. Collaboration view: judge all your contributions from the perspective of the other scholarly user
            3. Corroboration view: the truth of your contribution will be critically evaluated by others. For that purpose, its truth must be explicable. Explanation is your defence for your truth claim.
            4. Actors view: all scholars, scientists, members will be academic actors in the teaching arena during the seminar. All authors are named. They have an ID to recognize their responsibilities and contributions. The ID should not be a real name but identifiable for the time of the course.
    c. Seminar procedures
        i. Seminar projects
            1. Erstellen Sie zur nächsten Woche in einem Projektverzeichnis eine Textdatei (mit Markdown) mit Angaben zu
                a. Projekttitel
                b. Welche Daten?
                c. Welche Frage bezogen auf die Daten?
                d. Schaffen Sie einen Seminarnamen für Sie als (Co)-Autor des Projekts
        i. Computer and seminar requirements

1. Install GitHub desktop
   a. https://desktop.github.com/
   b. Tutorial: https://idratherbewriting.com/learnapidoc/pubapis_github_desktop_client.html
2. GitHub:
   a. A teaching directory for this course is mirrored in a PUBLIC GitHub directory.   that all files in this directory are openly visible.
   b. https://github.com/grasshoff/philhistcomp.git
3. Anaconda installation python 3.7
   a. https://www.anaconda.com/distribution/
   b. Change to your teaching directory and invoke
      i. "jupyter lab"
2. Research objects, paradigmatic hypothesis (30. April 2020)
   a. Introductory example:
      i. Example Medium blog, Example Project #1: Nearest Library in NY
         1. https://towardsdatascience.com/new-to-data-visualization-start-with-new-york-city-107785f836ab
         2. Video: https://www.youtube.com/watch?v=Xyn8-2YEFOQ&feature=youtu.be
         3. Github: https://github.com/thomashikaru/nycvisualization
         4. Create a Jupyter notebook and run the code
   b. Propose a project
      1. Create a project subdirectory including a readme.md
3. From research objects to research data
   a. Presentation of projects: Research objects in pandas dataframes
      i. Examples created by participants
   b. Characterization of the data acquisition process:
      i. Measurement
      ii. Data evaluation
      iii. Data
   c. Feature space of research objects
      i. Requirements
      ii.
   d. Representative sets of research objects
   e. Conditions of feature space
4. Data publication
5. Collaborative Science
6. Static models
   a. Inference to new features
7. Classification models
8. Dynamic models
   a. Use of temporal regularities
9. Causal models
10. Explanatory models
11. Empirical adequacy of models
    a. Model fitting

        b. Simulation models
12. Comparing models
13. Research publication incl. research data and notebooks