

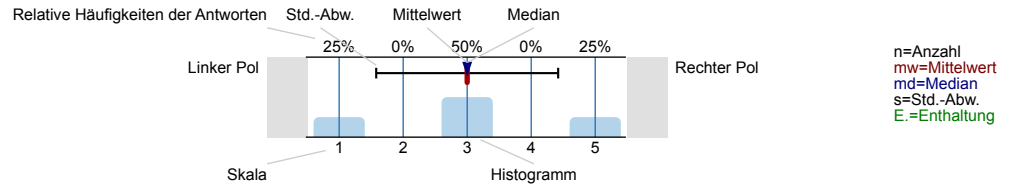
Matthias Carl Laupichler

ML Foundations in Python (09/23) ()
Erfasste Fragebögen = 12

Auswertungsteil der geschlossenen Fragen

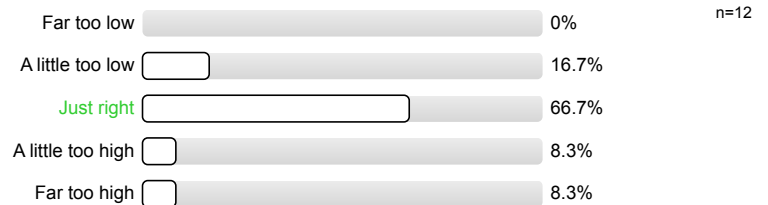
Legende

Fragetext

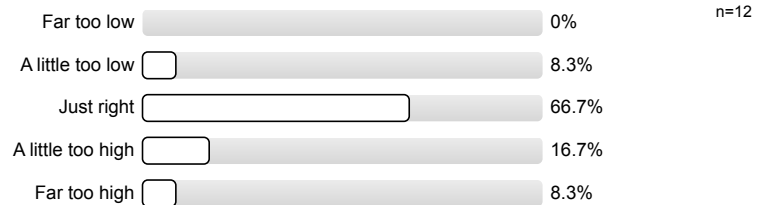


1. Questions about the course (1)

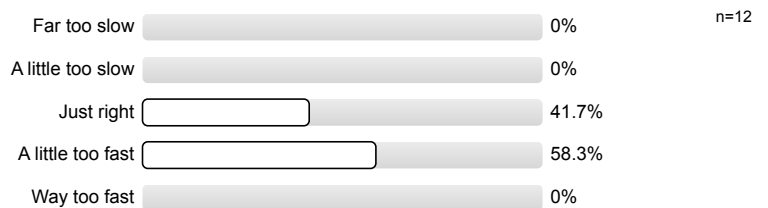
1.1) The difficulty of the lecture part of the course (i.e., theoretical input by instructors) is...



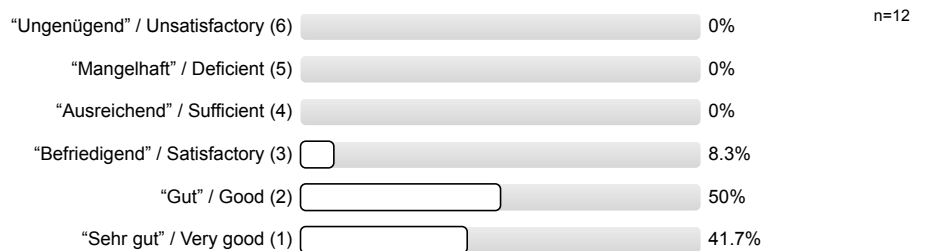
1.2) The difficulty of the exercise part of the course (e.g. programming exercises in python) is...



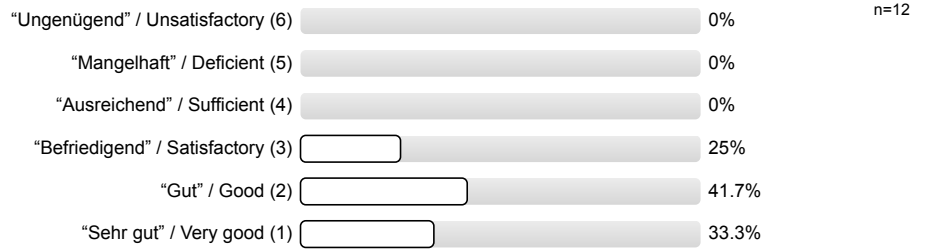
1.3) The pace of the course is...



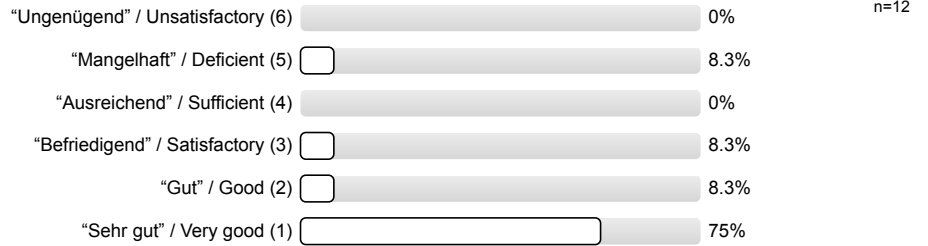
1.4) Overall, I give the course the following school grade:



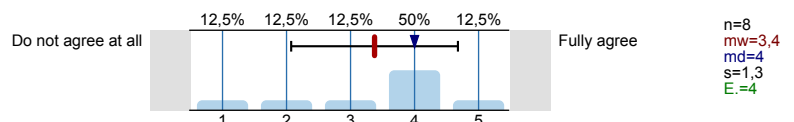
1.5) Overall, I give the lecture part of the course (i.e., theoretical input by instructors) the following school grade:



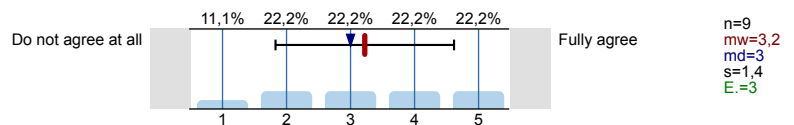
1.6) Overall, I give the exercise part of the course (e.g., programming exercises in python) the following school grade:



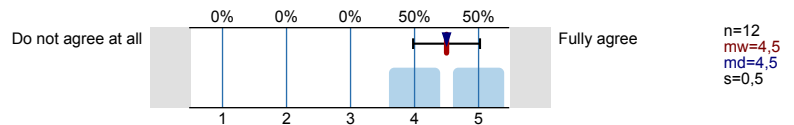
1.7) The course is useful for conducting my research projects.



1.8) I can use what I have learned independently in my research projects.

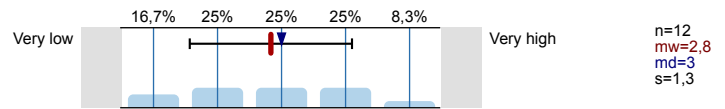


1.9) The amount of examples in the course was appropriate.

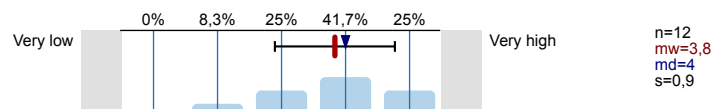


2. Evaluation of Learning Objectives

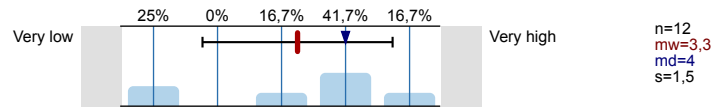
2.1) **Python programming (in general):**
My skills in this area *before* starting the course were...



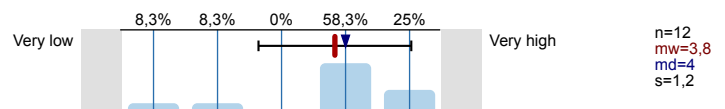
2.2) **Python programming (in general):**
My skills in this area are *now*...



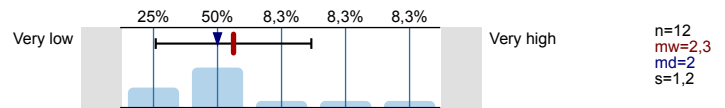
2.3) **I can use the Linux terminal/console.**
My skills in this area *before* starting the course were...



2.4) **I can use the Linux terminal/console.**
My skills in this area are *now*...



2.5) **I can explain gradient descent techniques.**
My skills in this area *before* starting the course were...



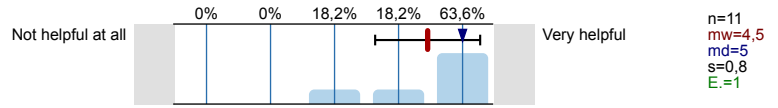
2.6)	I can explain gradient descent techniques. My skills in this area are <i>now</i> ...		Very low	Very high	n=12 mw=3,8 md=4 s=1
2.7)	I can calculate descriptive statistics like mean, variance, and distribution in Python. My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=12 mw=3,4 md=3,5 s=1,6
2.8)	I can calculate descriptive statistics like mean, variance, and distribution in Python. My skills in this area are <i>now</i> ...		Very low	Very high	n=12 mw=4,3 md=5 s=1
2.9)	I can explain the concept of Eigenvalues and their importance for PCA. My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=12 mw=1,9 md=2 s=1
2.10)	I can explain the concept of Eigenvalues and their importance for PCA. My skills in this area are <i>now</i> ...		Very low	Very high	n=12 mw=3,4 md=3,5 s=0,9
2.11)	I can demonstrate how k-nearest neighbors algorithms work in Python. My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=12 mw=1,1 md=1 s=0,3
2.12)	I can demonstrate how k-nearest neighbors algorithms work in Python. My skills in this area are <i>now</i> ...		Very low	Very high	n=12 mw=3,5 md=3,5 s=1
2.13)	I can demonstrate how support vector machine algorithms work in Python. My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=12 mw=1,1 md=1 s=0,3
2.14)	I can demonstrate how support vector machine algorithms work in Python. My skills in this area are <i>now</i> ...		Very low	Very high	n=12 mw=3,3 md=4 s=1,1
2.15)	I can demonstrate how decision tree and random forest algorithms work in Python. My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=12 mw=1,1 md=1 s=0,3
2.16)	I can demonstrate how decision tree and random forest algorithms work in Python. My skills in this area are <i>now</i> ...		Very low	Very high	n=12 mw=3,1 md=3 s=0,8
2.17)	I can demonstrate how k-means algorithms work in Python. My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=12 mw=1,1 md=1 s=0,3
2.18)	I can demonstrate how k-means algorithms work in Python. My skills in this area are <i>now</i> ...		Very low	Very high	n=12 mw=2,9 md=3 s=0,8

2.19)	I can explain the concept of Gaussian mixture models. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12 mw=1,4 md=1 s=0,5
2.20)	I can explain the concept of Gaussian mixture models. My skills in this area are <i>now</i> ...	Very low		Very high	n=12 mw=3,4 md=3 s=1,1
2.21)	I can use PCA for dimensionality reduction in Python. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12 mw=1,3 md=1 s=0,5
2.22)	I can use PCA for dimensionality reduction in Python. My skills in this area are <i>now</i> ...	Very low		Very high	n=12 mw=3,4 md=4 s=1,1
2.23)	I can explain the concepts of feedforward neural networks and convolutional neural networks. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12 mw=1,1 md=1 s=0,3
2.24)	I can explain the concept of feedforward neural networks and convolutional neural networks. My skills in this area are <i>now</i> ...	Very low		Very high	n=12 mw=3,3 md=3 s=0,9
2.25)	I can demonstrate the training process of simple neural networks in Python. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12 mw=1,1 md=1 s=0,3
2.26)	I can demonstrate the training process of simple neural networks in Python. My skills in this area are <i>now</i> ...	Very low		Very high	n=12 mw=3,5 md=3,5 s=1
2.27)	I can explain the link between convolutional neural networks and cross correlation. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12 mw=1 md=1 s=0
2.28)	I can explain the link between convolutional neural networks and cross correlation. My skills in this area are <i>now</i> ...	Very low		Very high	n=12 mw=2,5 md=2 s=0,9

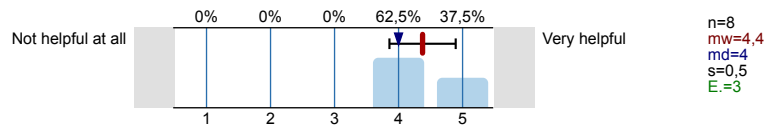
3. Questions about the course (2)

3.1)	Was GitHub a helpful tool for conducting the course?	Not helpful at all		Very helpful	n=12 mw=4,8 md=5 s=0,6
3.2)	If you attempted to complete the optional exercises: Were the optional exercises helpful in improving your understanding of the material?	Not helpful at all		Very helpful	n=12 mw=4,2 md=4 s=0,7

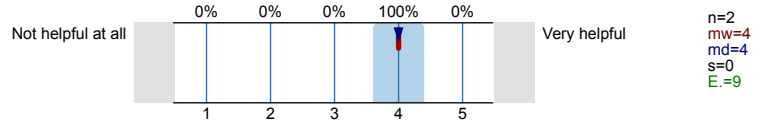
3.3) Was the introduction to the HPC-Cluster helpful?



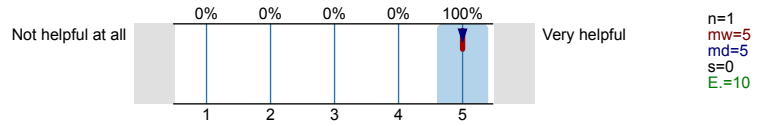
3.4) --- Please answer the following question only if you chose the track on the topic "**Medical Image Segmentation**" (on day 13)! --- How helpful was the track topic in teaching relevant machine learning skills?



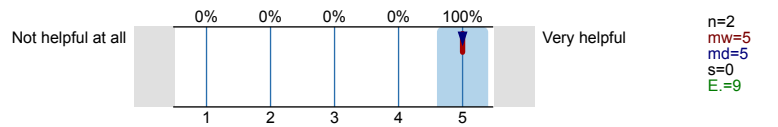
3.5) --- Please answer the following question only if you chose the track on the topic "**Brain Decoding**" (on day 13)! --- How helpful was the track topic in teaching relevant machine learning skills?



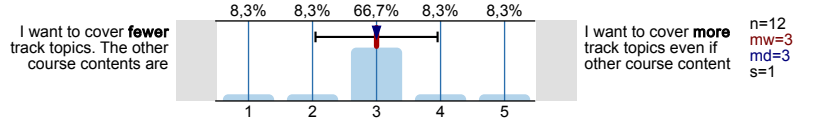
3.6) --- Please answer the following question only if you chose the track on the topic "**Pretrained Transformers**" (on day 15)! --- How helpful was the track topic in teaching relevant machine learning skills?



3.7) --- Please answer the following question only if you chose the track on the topic "**Recurrent Neural Networks**" (on day 15)! --- How helpful was the track topic in teaching relevant machine learning skills?

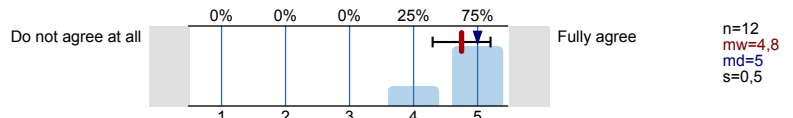


3.8) Would you prefer to cover more/all track topics in the course?

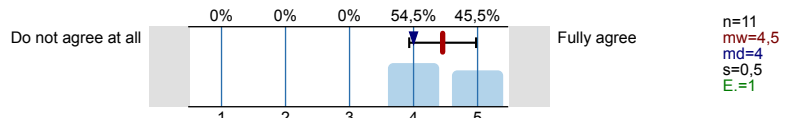


4. Questions about the course (3)

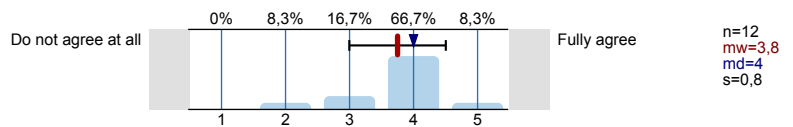
4.1) The course follows a clear structure.



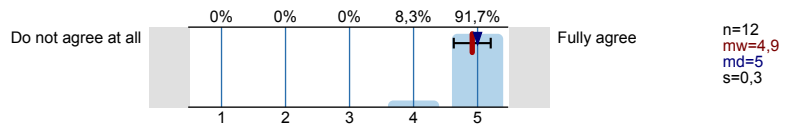
4.2) The way the course is designed adds to the understanding of the material.



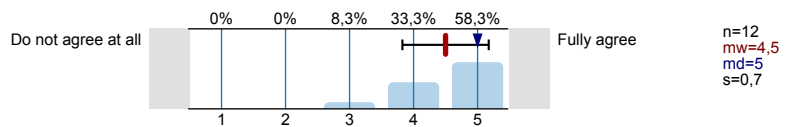
4.3) The course has a good mix of knowledge transfer, interactive elements and discussion.



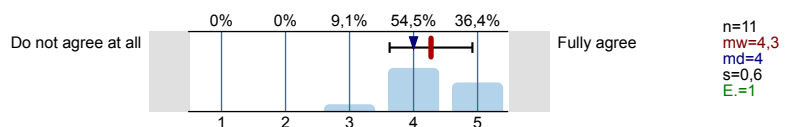
4.4) The instructors are responsive to students' questions and suggestions.



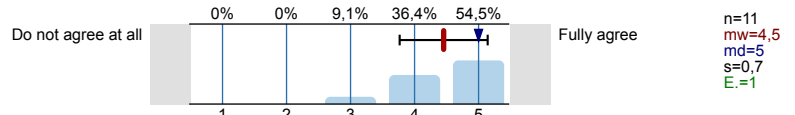
4.5) The instructors clarify the usability and usefulness of the course content.



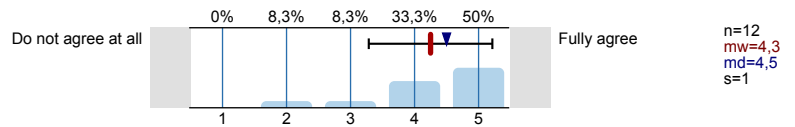
4.6) The instructors use good teaching materials (e.g., slides, presentations, bibliography, script) to support the learning process.



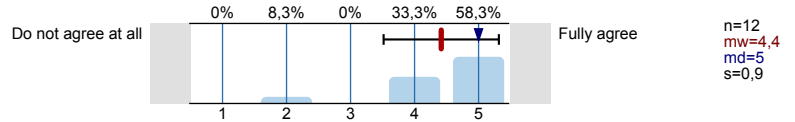
4.7) The instructors have good time management skills.



4.8) The instructors express themselves clearly and comprehensively.

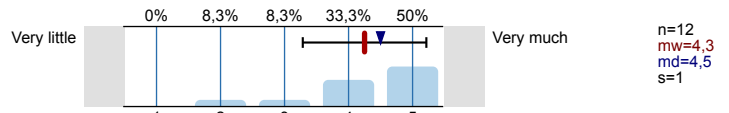


4.9) The instructors encourage active student participation in the course.

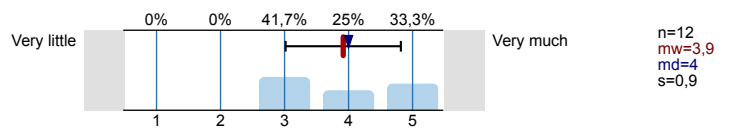


5. Questions about the course (4)

5.1) How much did you learn in this course?

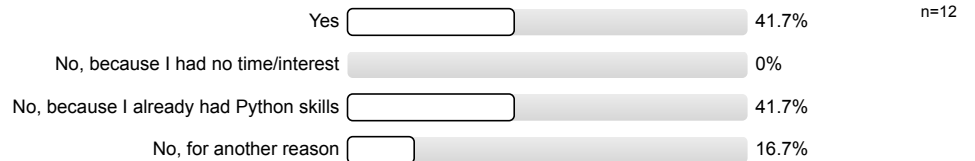


5.2) How interested were you in the topic *before* the course began?

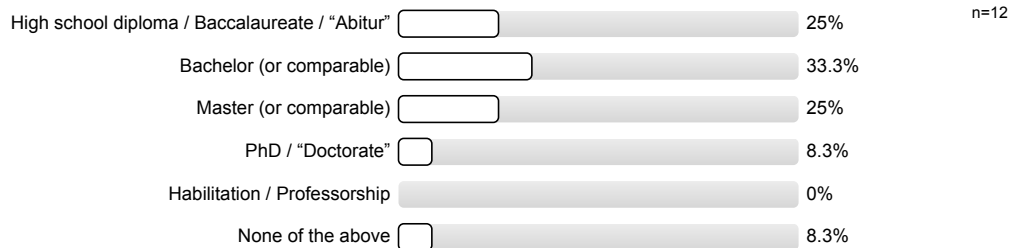


6. Participant statistics

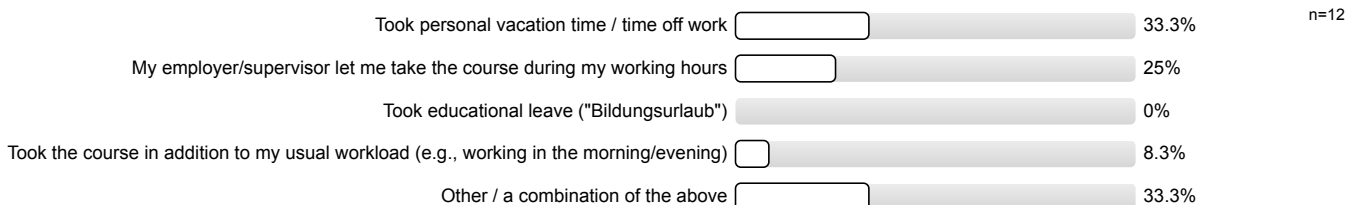
6.1) Did you attend the Python preparation course offered by Jan Steiner?



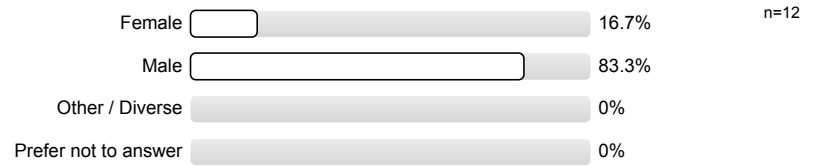
6.2) What is your highest educational qualification?



6.4) How did you find time to take part in this course?



6.5) To which gender identity do you most identify?

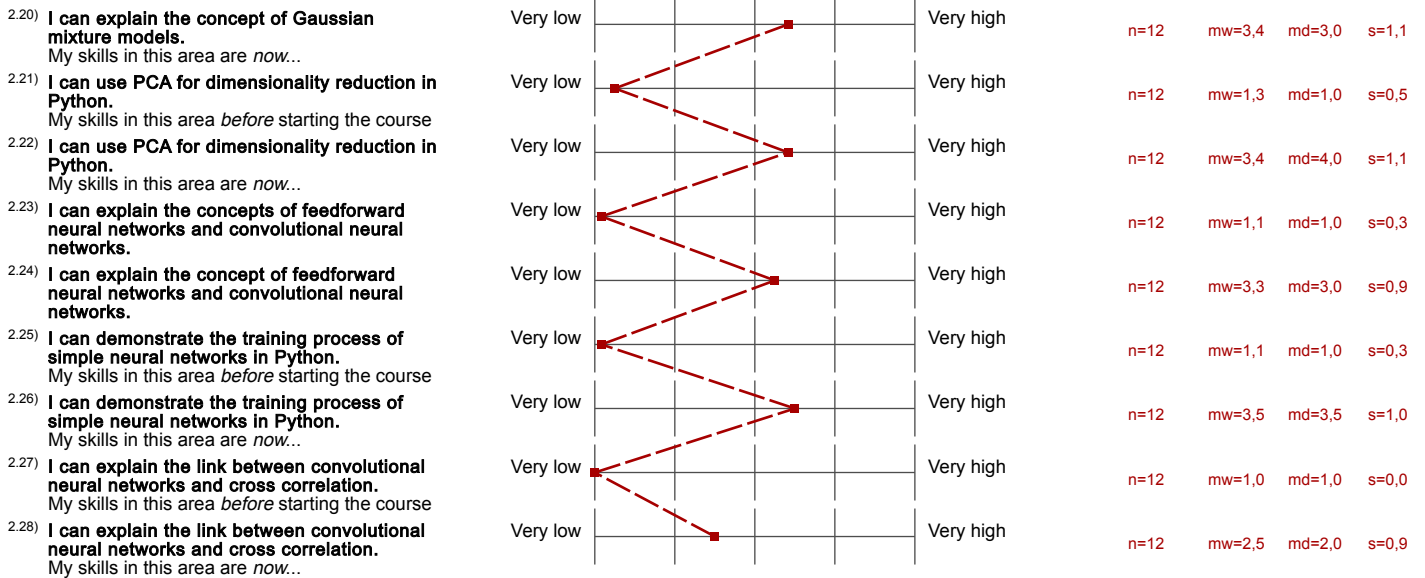


1. Questions about the course (1)

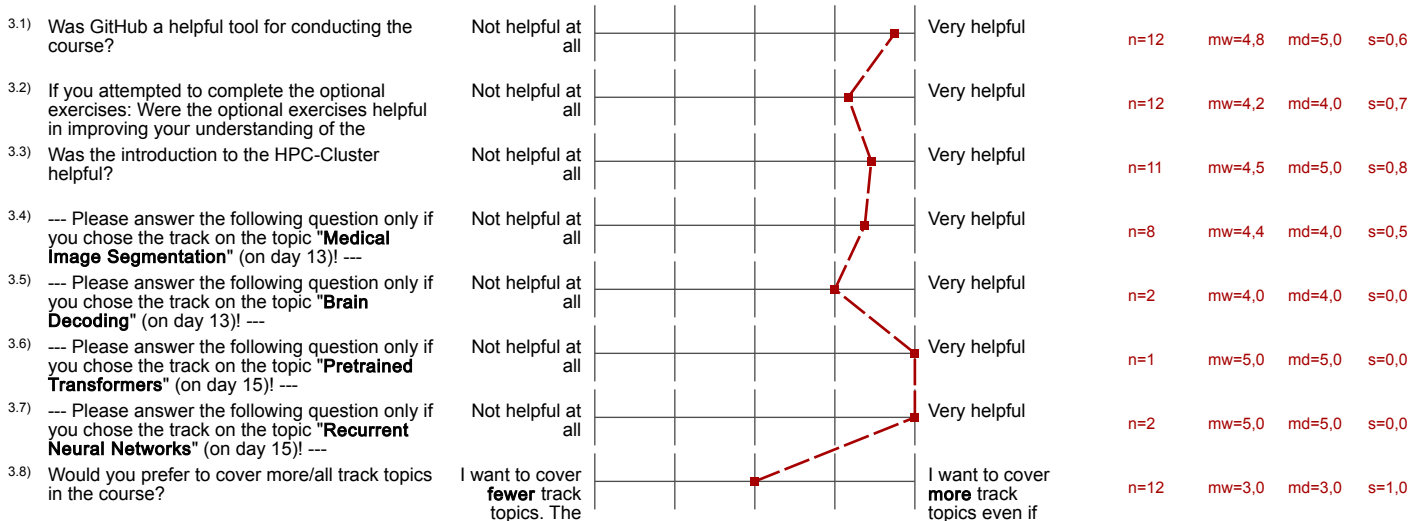
1.7) The course is useful for conducting my research projects.	Do not agree at all		Fully agree	n=8	mw=3,4	md=4,0	s=1,3
1.8) I can use what I have learned independently in my research projects.	Do not agree at all		Fully agree	n=9	mw=3,2	md=3,0	s=1,4
1.9) The amount of examples in the course was appropriate.	Do not agree at all		Fully agree	n=12	mw=4,5	md=4,5	s=0,5

2. Evaluation of Learning Objectives

2.1) Python programming (in general): My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=2,8	md=3,0	s=1,3
2.2) Python programming (in general): My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=3,8	md=4,0	s=0,9
2.3) I can use the Linux terminal/console. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=3,3	md=4,0	s=1,5
2.4) I can use the Linux terminal/console. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=3,8	md=4,0	s=1,2
2.5) I can explain gradient descent techniques. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=2,3	md=2,0	s=1,2
2.6) I can explain gradient descent techniques. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=3,8	md=4,0	s=1,0
2.7) I can calculate descriptive statistics like mean, variance, and distribution in Python. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=3,4	md=3,5	s=1,6
2.8) I can calculate descriptive statistics like mean, variance, and distribution in Python. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=4,3	md=5,0	s=1,0
2.9) I can explain the concept of Eigenvalues and their importance for PCA. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=1,9	md=2,0	s=1,0
2.10) I can explain the concept of Eigenvalues and their importance for PCA. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=3,4	md=3,5	s=0,9
2.11) I can demonstrate how k-nearest neighbors algorithms work in Python. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=1,1	md=1,0	s=0,3
2.12) I can demonstrate how k-nearest neighbors algorithms work in Python. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=3,5	md=3,5	s=1,0
2.13) I can demonstrate how support vector machine algorithms work in Python. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=1,1	md=1,0	s=0,3
2.14) I can demonstrate how support vector machine algorithms work in Python. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=3,3	md=4,0	s=1,1
2.15) I can demonstrate how decision tree and random forest algorithms work in Python. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=1,1	md=1,0	s=0,3
2.16) I can demonstrate how decision tree and random forest algorithms work in Python. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=3,1	md=3,0	s=0,8
2.17) I can demonstrate how k-means algorithms work in Python. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=1,1	md=1,0	s=0,3
2.18) I can demonstrate how k-means algorithms work in Python. My skills in this area are <i>now</i> ...	Very low		Very high	n=12	mw=2,9	md=3,0	s=0,8
2.19) I can explain the concept of Gaussian mixture models. My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=12	mw=1,4	md=1,0	s=0,5



3. Questions about the course (2)

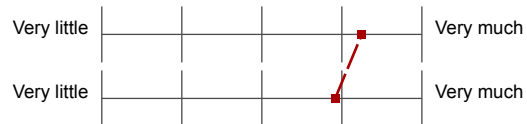


4. Questions about the course (3)



5. Questions about the course (4)

5.1) How much did you learn in this course?



n=12 mw=4,3 md=4,5 s=1,0

5.2) How interested were you in the topic **before** the course began?

n=12 mw=3,9 md=4,0 s=0,9

Auswertungsteil der offenen Fragen

5. Questions about the course (4)

5.3) What did you like most about the course?

- -Tutors are really patient and explain everything
-Giving proper foundations for further studyings
-Tutors encourage to learn more and to do tasks
- Exercises connected well with the lectures.
Good introduction to and explanation of ML.
- For me it was very good that the lectures were accompanied by the exercise parts. Therefore, it was possible to develop a better understanding for the different topics. The best part of the course were the prepared codes which helped that I could concentrate on the relevant parts of the topics. In addition, the tests for the functions of the codes were very nice for not losing time in not relevant problems.
- I liked that we spent a lot of time programming things ourselves. This allowed me to understand the topics better and gain experience using the algorithms.
Also the lecture slides were mostly very helpful in getting across the most important information, and most of the lectures were well explained by the lecturer. The lecturers always answered questions thoroughly.

Overall, I enjoyed the course very much and learned a lot from it. It was always a friendly environment.

- I liked the most the exercises about the SVR models in the second week .
Overall the exercises were the most fun in the course.
I liked the hints in the codes that told you what you need to do.
These are useful to grasp what you did in the code after the course.
Maybe add just a little more resources that you can use to self study the course's contents after the course has finished because in my opinion three weeks are too short to fully understand everything.
Overall a great course!!!! I will try and take part in more courses like this!
- In the first week, I liked that there was the option to work through some relevant literature (Nielsen) and implement back-propagation and gradient-descent manually for MNIST after finishing the exercises.
In the second week, I especially liked the first days where we were implementing the machine learning algorithms ourselves from scratch (except for numpy operations).
In the third week, the track exercises were the highlight.

Overall, I liked that the course presented both "classic" machine learning methods as well as neural networks.

- Practical part
- The lectures were very well done. the instructors had a great capability to explain the contents, over the lecture and when we needed help.
- The programming exercises were really fun and I learned a lot from them. The instructors were very helpful and nice when we had questions, they took a lot of time to answer our questions and help us with our code.
- the course is conducted in intensive 15 days, which is a big advantage for students to follow one and other one, deeper and deeper. And the lectures and TA encourage and help a lot, they are patient and nice. People with different programming level can benefit accordingly.

5.4) What could be improved about this course?

- -internet connection at classroom
- I find it hard to connect the lectures with the exercises, maybe I don't have the computer science background.
- I think that some of us would feel more confident in being in a class with students who are all learning almost from the beginning. And with a part of concrete application in our personal data analysis. Personally, sometimes I found that procedures were too abstract, compared to the real application in my experiments. I assume that all of this would require more classrooms and more time, but I believe that the instructors have a big potential, which could be exploited in that sense. I really hope that these courses will grow :)
- Lectures
- Maybe it would be nice to show more examples which the discussed algorithm or model are applied to.
- The Theory parts often felt a little rushed and like they were not the focus. I would have liked them to take more time to explain the concepts more in depth especially during the last week when it came to neural networks.
- The first week was a bit slow if one had done any math courses at all in the last few years, but since suggestions for advanced material were given, this was not really bad. I found that working through the first chapters of the Nielsen textbook and implementing back-propagation manually improved my understanding of the topics of the third week a lot, and I would have been sad to miss this, so maybe one could consider incorporating this into the exercises officially somehow.
In the second week, it would have been nice to implement more models manually instead of relying on Scikit learn. The library is just

too nice to learn about the models, since every model has the exact same interface, so one does not have to care about the internals at all.

In the third week, my understanding would have remained fairly superficial had it not been for reading the Nielsen book in the first week, and it does remain a little bit superficial, due to the libraries being a bit opaque (which is in practice of course nice, but not for learning) and the explanations fairly high-level. However, due to the limited time, I understand that one can not cover everything in detail, especially when the goal is to get to practically useful methods too.

Overall, for me personally, the first week could have been compressed a bit in favor of going into more detail in the second and third week, however I understand that due to different backgrounds of the participants, compressing the first week too much is maybe also not a good idea. Maybe one could put the very basic math like derivatives into a pre-course of some sort?

- The only thing which could be improved is the duration of the lectures. Sometimes, for me it was difficult to follow the contents, especially in the last week. Maybe it would be better to have lectures of 90min (with a break) in order to have more time to explain the presented contents more in details.
- The three-week block course is very dense in time. Mostly because of that, I could not read one of the two advised text books. On the other hand, a spread-out semester course is the other extreme, and may be worse for some people. I am not sure if an improvement is possible. I suppose those who are very interested will have read, or will read, more about it before or after the course.
- The way the practice assignments were represented was somewhat inconsistent. Sometimes we had a list of very specific instructions for each step, other times it was a bit loose and confusing. Especially, I found it strange that sometimes these instructions were numbered and sometimes not. Some of the tutors seemed to know much less about the given topic than others. However those that seemed to know more were always very helpful. There were mainly two lecturers, and one of them always seemed very hectic during the lecture, which made it much more tiring to follow everything. I wish that we could have gone into the theory of some of the topics more thoroughly, however this is probably impossible with the limited time we have in this course.

6. Participant statistics

6.3) What is your main field of research?

- Clinical neuroscience
- Cold atoms (physics)
- Computer Science
- HPC
- I do not do research yet, i'm still doing my bachelors.
- Physics (3 Nennungen)
- Physics, Chemistry
- climate modelling, oceanography
- neuroscience

6.6) What is your age (in years)?

- 18
- 20
- 22
- 23 (3 Nennungen)
- 29
- 30
- 35
- 39
- 43