

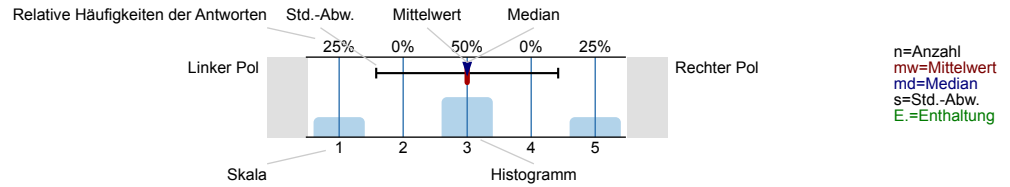
## Matthias Carl Laupichler

ML Foundations in Python (09/24) ()  
Erfasste Fragebögen = 11

## Auswertungsteil der geschlossenen Fragen

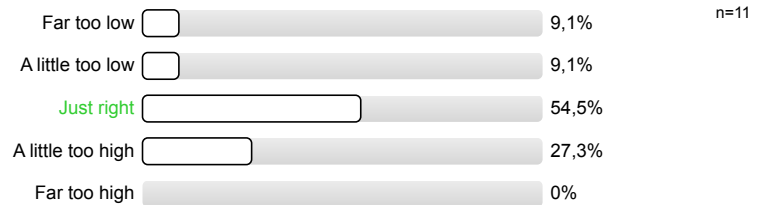
## Legende

Fragetext

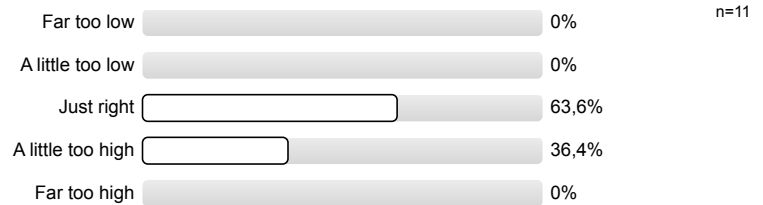


## 1. Questions about the course (1)

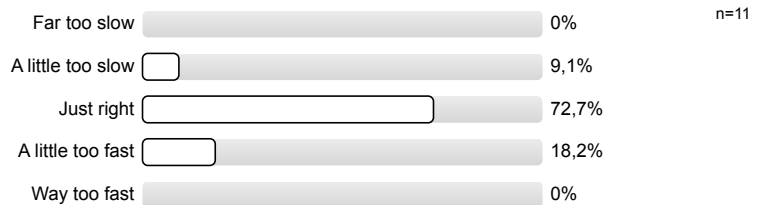
1.1) The difficulty of the lecture part of the course (i.e., theoretical input by instructors) is...



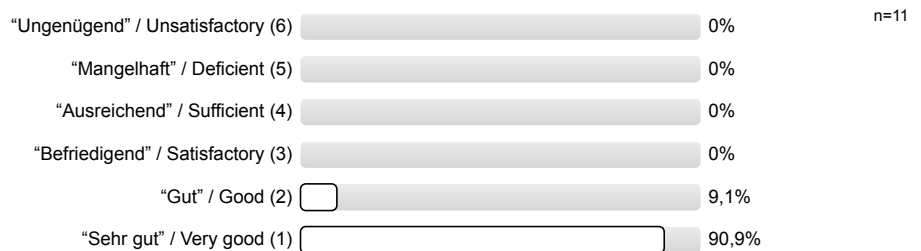
1.2) The difficulty of the exercise part of the course (e.g. programming exercises in python) is...



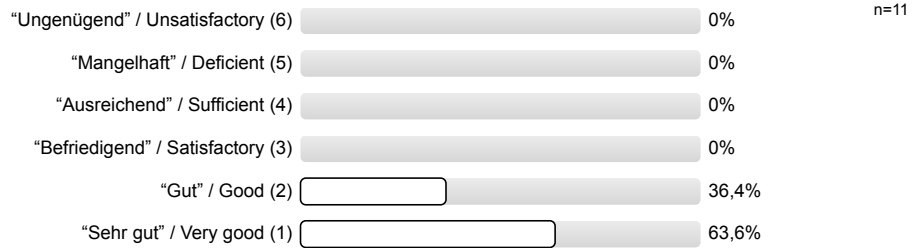
1.3) The pace of the course is...



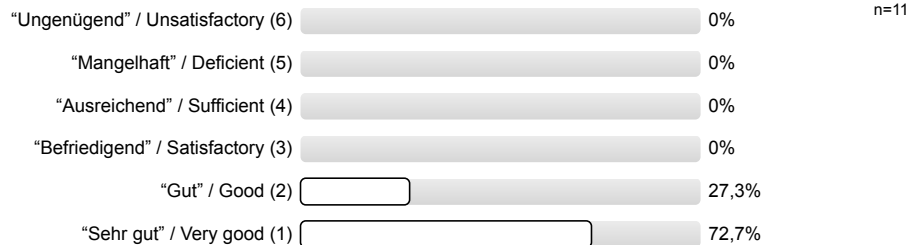
1.4) Overall, I give the course the following school grade:



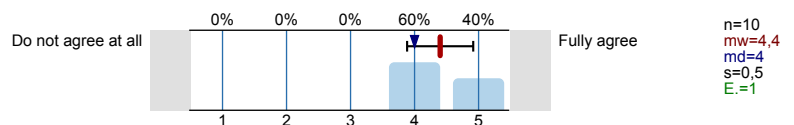
1.5) Overall, I give the lecture part of the course (i.e., theoretical input by instructors) the following school grade:



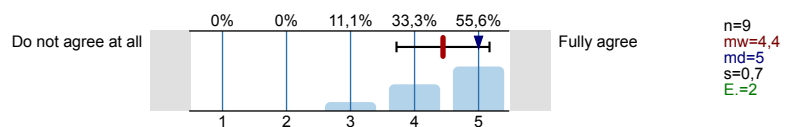
1.6) Overall, I give the exercise part of the course (e.g., programming exercises in python) the following school grade:



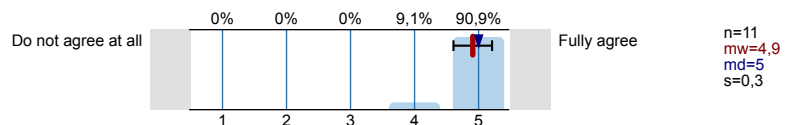
1.7) The course is useful for conducting my research projects.



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

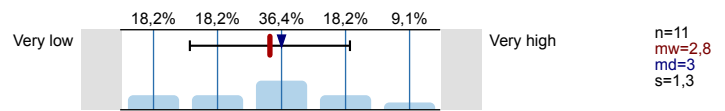


1.9) The amount of examples in the course was appropriate.

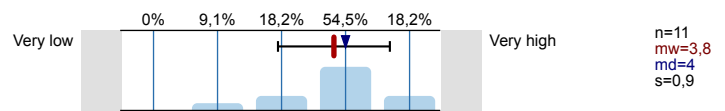


## 2. Evaluation of Learning Objectives

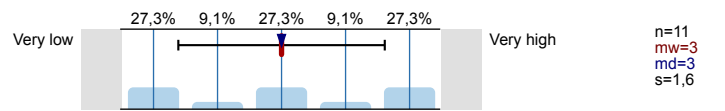
2.1) **Python programming (in general):**  
My skills in this area *before* starting the course were...



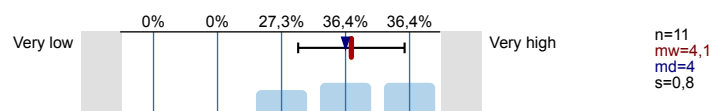
2.2) **Python programming (in general):**  
My skills in this area are *now*...



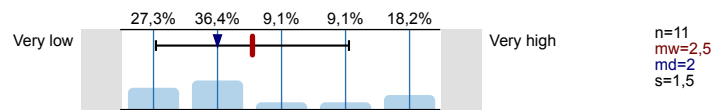
2.3) **I can use the Linux terminal/console.**  
My skills in this area *before* starting the course were...



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...

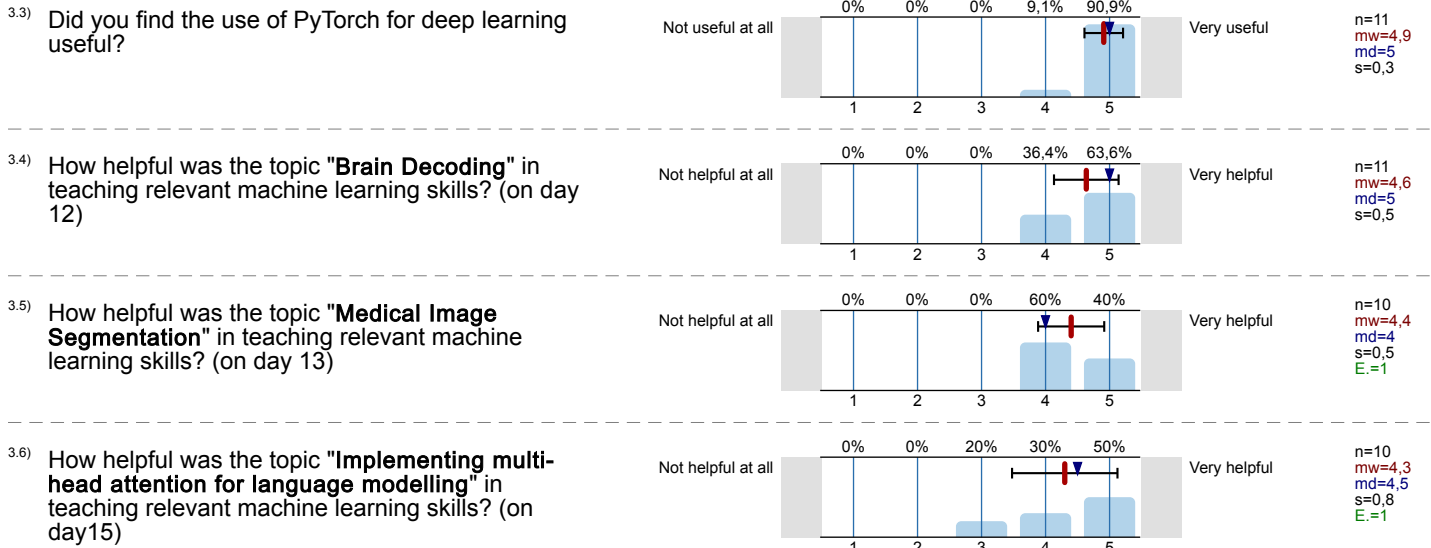


2.6)	<b>I can explain gradient descent techniques.</b> My skills in this area are <i>now</i> ...		Very low	Very high	n=11 mw=4,2 md=4 s=0,6
2.7)	<b>I can calculate descriptive statistics like mean, variance, and distribution in Python.</b> My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=11 mw=3,7 md=4 s=1,3
2.8)	<b>I can calculate descriptive statistics like mean, variance, and distribution in Python.</b> My skills in this area are <i>now</i> ...		Very low	Very high	n=11 mw=4,6 md=5 s=0,7
2.9)	<b>I can explain the concept of Eigenvalues and their importance for PCA.</b> My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=10 mw=2,4 md=2 s=1,2 E.=1
2.10)	<b>I can explain the concept of Eigenvalues and their importance for PCA.</b> My skills in this area are <i>now</i> ...		Very low	Very high	n=10 mw=4,3 md=4 s=0,5 E.=1
2.11)	<b>I can demonstrate how k-nearest neighbors algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=11 mw=1,1 md=1 s=0,3
2.12)	<b>I can demonstrate how k-nearest neighbors algorithms work in Python.</b> My skills in this area are <i>now</i> ...		Very low	Very high	n=11 mw=4,1 md=4 s=0,7
2.13)	<b>I can demonstrate how support vector machine algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=11 mw=1,1 md=1 s=0,3
2.14)	<b>I can demonstrate how support vector machine algorithms work in Python.</b> My skills in this area are <i>now</i> ...		Very low	Very high	n=11 mw=3,9 md=4 s=0,8
2.15)	<b>I can demonstrate how decision tree and random forest algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=11 mw=1,1 md=1 s=0,3
2.16)	<b>I can demonstrate how decision tree and random forest algorithms work in Python.</b> My skills in this area are <i>now</i> ...		Very low	Very high	n=11 mw=4,1 md=4 s=0,7
2.17)	<b>I can demonstrate how k-means algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...		Very low	Very high	n=11 mw=1,1 md=1 s=0,3
2.18)	<b>I can demonstrate how k-means algorithms work in Python.</b> My skills in this area are <i>now</i> ...		Very low	Very high	n=11 mw=4,2 md=4 s=0,8

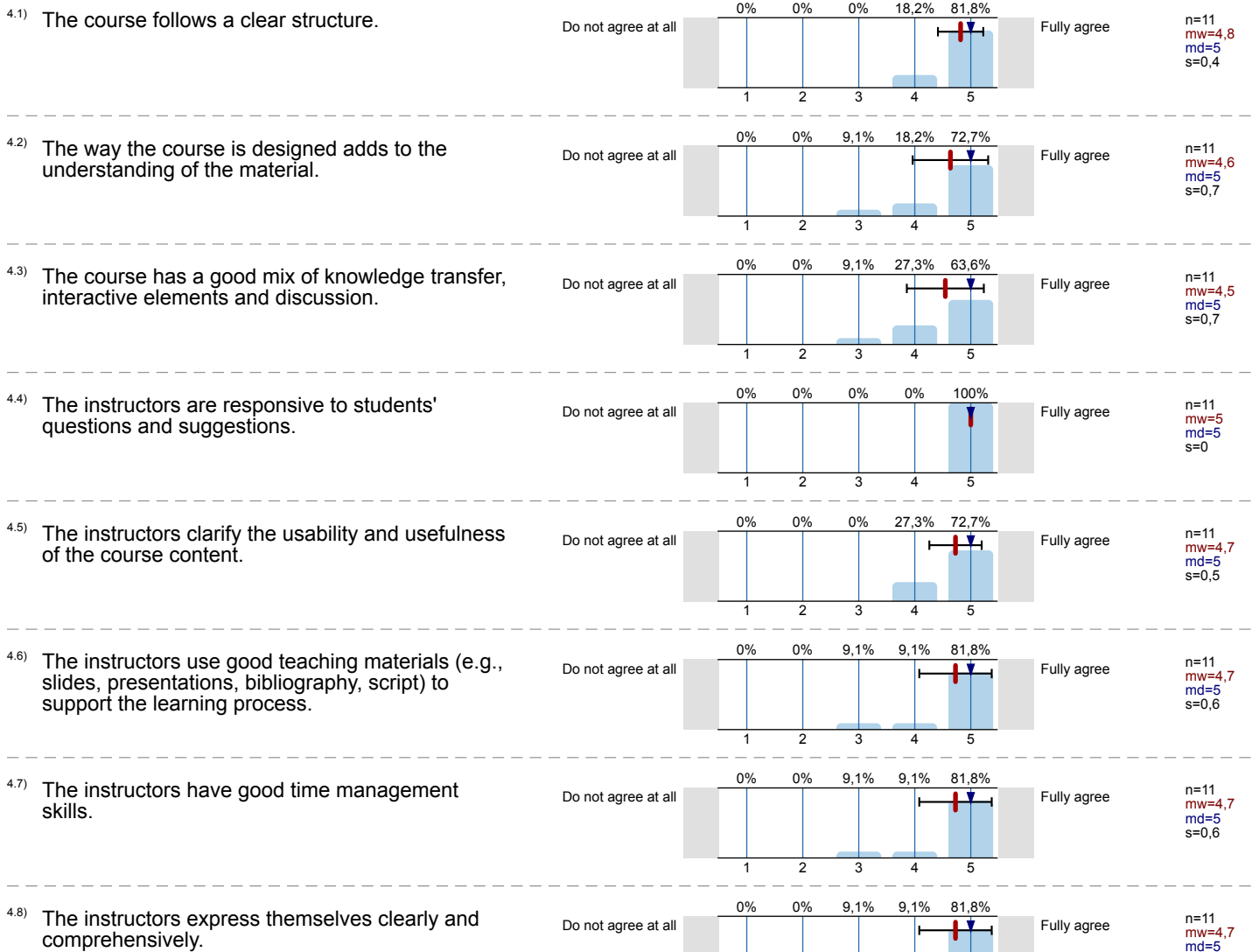
2.19)	<b>I can explain the concept of Gaussian mixture models.</b> My skills in this area <i>before</i> starting the course were...	Very low	81,8% 18,2% 0% 0% 0%	Very high	n=11 mw=1,2 md=1 s=0,4
2.20)	<b>I can explain the concept of Gaussian mixture models.</b> My skills in this area are <i>now</i> ...	Very low	0% 18,2% 9,1% 45,5% 27,3%	Very high	n=11 mw=3,8 md=4 s=1,1
2.21)	<b>I can use PCA for dimensionality reduction in Python.</b> My skills in this area <i>before</i> starting the course were...	Very low	90,9% 9,1% 0% 0% 0%	Very high	n=11 mw=1,1 md=1 s=0,3
2.22)	<b>I can use PCA for dimensionality reduction in Python.</b> My skills in this area are <i>now</i> ...	Very low	0% 9,1% 18,2% 45,5% 27,3%	Very high	n=11 mw=3,9 md=4 s=0,9
2.23)	<b>I can explain the concepts of feedforward neural networks and convolutional neural networks.</b> My skills in this area <i>before</i> starting the course were...	Very low	81,8% 9,1% 9,1% 0% 0%	Very high	n=11 mw=1,3 md=1 s=0,6
2.24)	<b>I can explain the concept of feedforward neural networks and convolutional neural networks.</b> My skills in this area are <i>now</i> ...	Very low	0% 0% 18,2% 36,4% 45,5%	Very high	n=11 mw=4,3 md=4 s=0,8
2.25)	<b>I can demonstrate the training process of simple neural networks in Python.</b> My skills in this area <i>before</i> starting the course were...	Very low	81,8% 9,1% 9,1% 0% 0%	Very high	n=11 mw=1,3 md=1 s=0,6
2.26)	<b>I can demonstrate the training process of simple neural networks in Python.</b> My skills in this area are <i>now</i> ...	Very low	0% 0% 36,4% 27,3% 36,4%	Very high	n=11 mw=4 md=4 s=0,9
2.27)	<b>I can explain the link between convolutional neural networks and cross correlation.</b> My skills in this area <i>before</i> starting the course were...	Very low	90,9% 9,1% 0% 0% 0%	Very high	n=11 mw=1,1 md=1 s=0,3
2.28)	<b>I can explain the link between convolutional neural networks and cross correlation.</b> My skills in this area are <i>now</i> ...	Very low	18,2% 9,1% 0% 54,5% 18,2%	Very high	n=11 mw=3,5 md=4 s=1,4

### 3. Questions about the course (2)

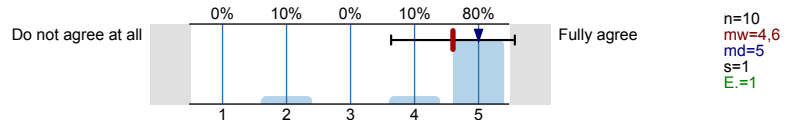
3.1)	Was GitHub a helpful tool for conducting the course?	Not helpful at all	0% 0% 0% 27,3% 72,7%	Very helpful	n=11 mw=4,7 md=5 s=0,5
3.2)	Was the introduction to the HPC-Cluster helpful?	Not helpful at all	0% 0% 33,3% 11,1% 55,6%	Very helpful	n=9 mw=4,2 md=5 s=1 E.=2



4. Questions about the course (3)

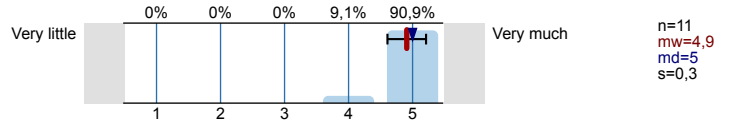


4.9) The instructors encourage active student participation in the course.

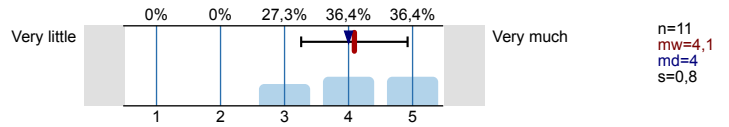


5. Questions about the course (4)

5.1) How much did you learn in this course?

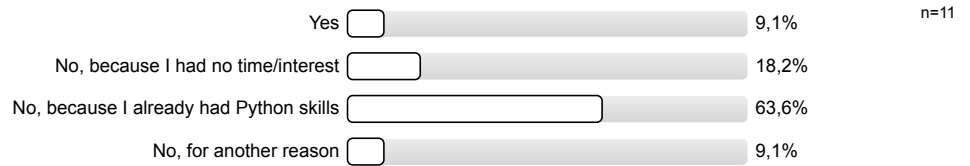


5.2) How interested were you in the topic *before* the course began?

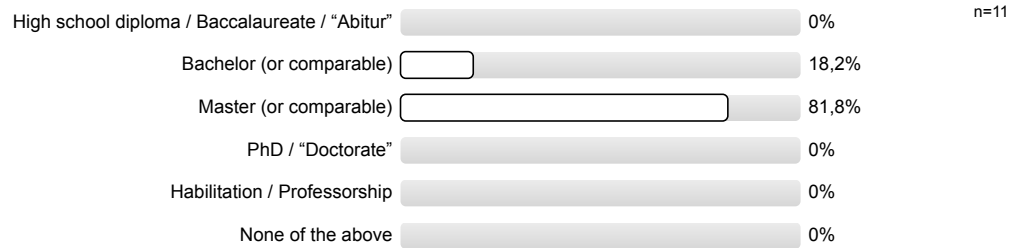


6. Participant statistics

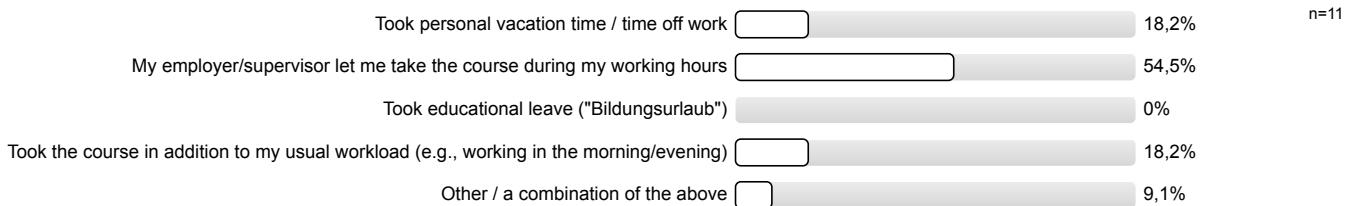
6.1) Did you attend the Python preparation course offered by Jan Steiner?



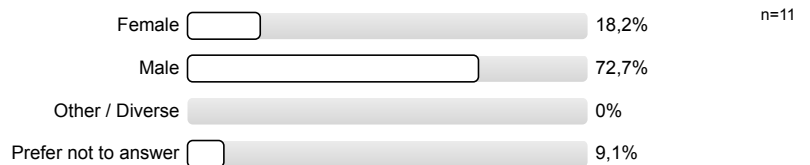
6.2) What is your highest educational qualification?



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



6.5) To which gender identity do you most identify?



# Profillinie

Teilbereich: Institut für Medizindidaktik  
 Name der/des Lehrenden: Matthias Carl Laupichler  
 Titel der Lehrveranstaltung: ML Foundations in Python (09/24)  
 (Name der Umfrage)

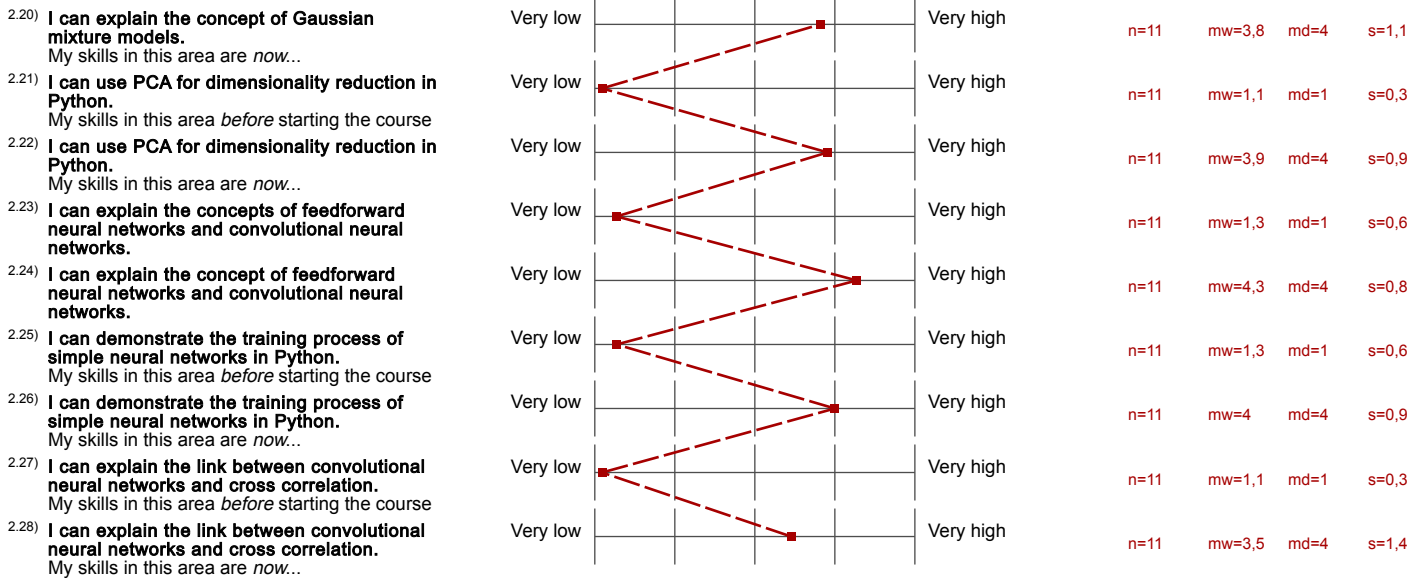
Verwendete Werte in der Profillinie: Mittelwert

## 1. Questions about the course (1)

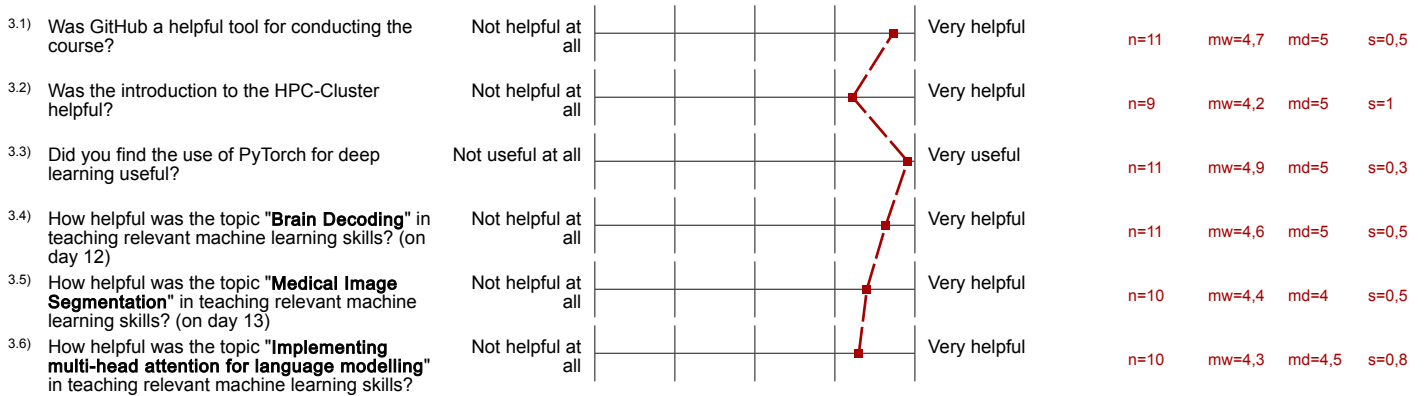
1.7) The course is useful for conducting my research projects.	Do not agree at all		Fully agree	n=10	mw=4,4	md=4	s=0,5
1.8) I can use what I have learned independently in my research projects.	Do not agree at all		Fully agree	n=9	mw=4,4	md=5	s=0,7
1.9) The amount of examples in the course was appropriate.	Do not agree at all		Fully agree	n=11	mw=4,9	md=5	s=0,3

## 2. Evaluation of Learning Objectives

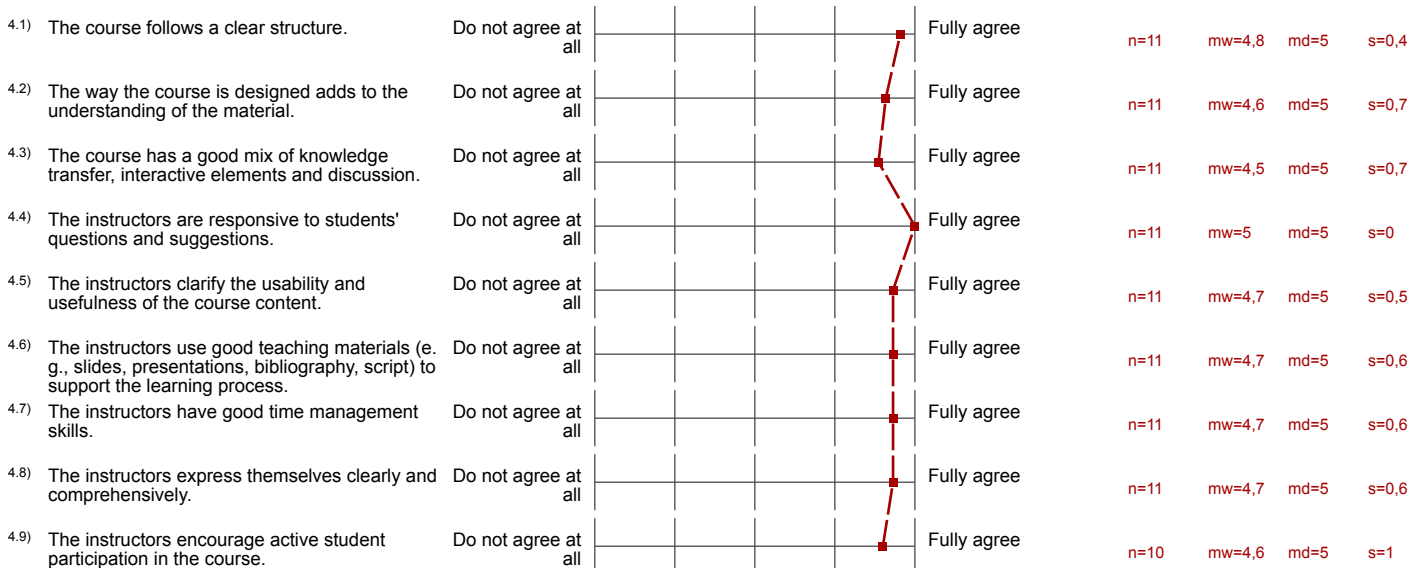
2.1) <b>Python programming (in general):</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=2,8	md=3	s=1,3
2.2) <b>Python programming (in general):</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=3,8	md=4	s=0,9
2.3) <b>I can use the Linux terminal/console.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=3	md=3	s=1,6
2.4) <b>I can use the Linux terminal/console.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=4,1	md=4	s=0,8
2.5) <b>I can explain gradient descent techniques.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=2,5	md=2	s=1,5
2.6) <b>I can explain gradient descent techniques.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=4,2	md=4	s=0,6
2.7) <b>I can calculate descriptive statistics like mean, variance, and distribution in Python.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=3,7	md=4	s=1,3
2.8) <b>I can calculate descriptive statistics like mean, variance, and distribution in Python.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=4,6	md=5	s=0,7
2.9) <b>I can explain the concept of Eigenvalues and their importance for PCA.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=10	mw=2,4	md=2	s=1,2
2.10) <b>I can explain the concept of Eigenvalues and their importance for PCA.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=10	mw=4,3	md=4	s=0,5
2.11) <b>I can demonstrate how k-nearest neighbors algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=1,1	md=1	s=0,3
2.12) <b>I can demonstrate how k-nearest neighbors algorithms work in Python.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=4,1	md=4	s=0,7
2.13) <b>I can demonstrate how support vector machine algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=1,1	md=1	s=0,3
2.14) <b>I can demonstrate how support vector machine algorithms work in Python.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=3,9	md=4	s=0,8
2.15) <b>I can demonstrate how decision tree and random forest algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=1,1	md=1	s=0,3
2.16) <b>I can demonstrate how decision tree and random forest algorithms work in Python.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=4,1	md=4	s=0,7
2.17) <b>I can demonstrate how k-means algorithms work in Python.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=1,1	md=1	s=0,3
2.18) <b>I can demonstrate how k-means algorithms work in Python.</b> My skills in this area are <i>now</i> ...	Very low		Very high	n=11	mw=4,2	md=4	s=0,8
2.19) <b>I can explain the concept of Gaussian mixture models.</b> My skills in this area <i>before</i> starting the course were...	Very low		Very high	n=11	mw=1,2	md=1	s=0,4



### 3. Questions about the course (2)



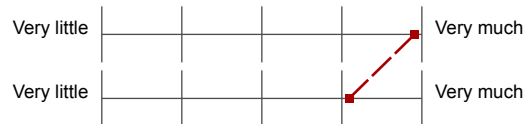
### 4. Questions about the course (3)





## 5. Questions about the course (4)

5.1) How much did you learn in this course?



n=11 mw=4,9 md=5 s=0,3

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

n=11 mw=4,1 md=4 s=0,8

## Auswertungsteil der offenen Fragen

### 5. Questions about the course (4)

#### 5.3) What did you like most about the course?

- I appreciated that students from every field were welcomed in the course, even when not coming from a strong mathematical / coding background. The lecturers and tutors were really friendly, non-judgemental and patient. The exercises used fun application examples. I think the course covers a lot of aspects in a relatively fast pace, which provides a great overview, but requires revisiting the topics later on to fully grasp them. Overall I learned a lot, had a lot of fun and got motivated to further explore the topics. One of the best courses I ever took, I would recommend to everyone interested in the topic!
- I liked it very much how Elena and Moritz presented and explained the topics. It was very clear and their explanations were very helpful. They were very patient and helpful with the programming tasks, I wasn't afraid to ask questions.
- I literally started out as a noob in ML and DL and was bit nervous when people around me used to speak in CNN language; and now I have the tools and knowledge to understand and train my own Neural Networks and implement Transformers. That speaks for itself.  
The mix of lectures and exercises were amazing! I got lot of time to solve exercises and ask questions.
- Instructors and tutors were very helpful. The lectures and exercises were interesting. The course was intense but very good for learning the stuff in a short period of time.
- The exercises, especially the difficulty of the exercises. Most of them were hard enough that they took a lot of time and effort but not so hard that they were impossible to do. I was forced to develop my python skills in order to be able to solve the exercises and could always use the new skills in the following days.
- The exercises were really cool, especially the optional tasks.
- The machine Learning algorithms.
- The supervised coding sessions were very helpful. This way, it was avoided that participants get stuck on minor problems that could be clarified easily and could focus on the broader learnings from the course.

#### 5.4) What could be improved about this course?

- A bit more emphasis and explanation regarding the basics of the neural network training (for me it went too fast to complex stuff). Additional information about hyperparameter tuning for neural nets (since for all methods prior to NNs this was a very interesting subject that seems to be important for real life applications)
- A bit more explanations for the todos of the exercises in the first three days and the last one would be helpful.
- Maybe there could be something like a hint structure implemented for the exercises to help beginners especially. Sometimes the understanding of what needs to be done / what is the desired output is hard to visualise in the exercises. As well as which functions are even available/possible  
for example:  
Exercise 1 - Hint 1: (explaining the main steps): in the init we want to add all the nn elements that we want to call in the forward path. then we call them in the forward path and update the initial input by feeding it to the next function.  
Exercise 1 - Hint 2: in the forward pass, the input needs to be reshaped in the correct form first  
Exercise 1 - Hint 3: for reshaping consider using th.permute()  
....  
This could be an addition to the help of the tutors.
- More about generative NNs. Offer the Advanced ML course directly "im Anschluss" so that all our obtained knowledge is still "frisch" from the current course.
- More optional tasks to dive into the topics more deeply.
- Most of the course is perfect , I would say. Exercises and Readme are well done.  
If anything, I would like to have some more details in the slides and make them more verbose. This would allow one to return to them in a year if needed and read them as notes.  
I also would not mind having bit longer lectures covering the theory in greater slightly greater detail before jumping into exercises.
- On the one hand, I liked the clear separation between theory and practice. On the other hand, I would have liked some more explanations about the programming tasks.
- There was a step change in difficulty in the exercise at the start of the neural networks exercises. More structure could have been provided for the first network exercise, and then gradually reduce the pre-given structure over the course of the next exercises. At the beginning of the exercises, some time could be devoted to clarify key components used in the exercises (e.g. explain what dataloaders are and how they can be used prior to the first exercise where they are used).

## 6. Participant statistics

6.3) What is your main field of research?

- Astronomy
- chemistry
- Economics
- Humanities
- Mathematics
- medicine
- Neurobiology
- Neuroscience
- Physics (2 Nennungen)
- Theoretical chemistry

6.6) What is your age (in years)?

- 23
- 24
- 25
- 27
- 29 (3 Nennungen)
- 31
- 35