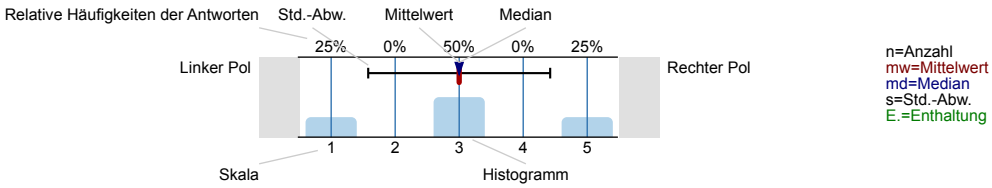
Dr. Matthias Carl Laupichler

ML Foundations (09/25) ()
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…

n=12

Far too low	0%
A little too low	8,3%
Just right	50%
A little too high	41,7%
Far too high	0%

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

n=12

Far too low	0%
A little too low	0%
Just right	75%
A little too high	25%
Far too high	0%

1.3) The pace of the course is…

n=12

Far too slow	0%
A little too slow	0%
Just right	50%
A little too fast	50%
Way too fast	0%

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

n=12

“Ungenügend” / Unsatisfactory (6)	0%
“Mangelhaft” / Deficient (5)	0%
“Ausreichend” / Sufficient (4)	0%
“Befriedigend” / Satisfactory (3)	0%
“Gut” / Good (2)	16,7%
“Sehr gut” / Very good (1)	83,3%

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

n=12

“Ungenügend” / Unsatisfactory (6)	0%
“Mangelhaft” / Deficient (5)	0%
“Ausreichend” / Sufficient (4)	0%
“Befriedigend” / Satisfactory (3)	0%
“Gut” / Good (2)	25%
“Sehr gut” / Very good (1)	75%

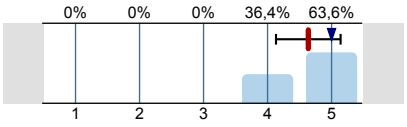
1.6) Overall, I give the exercise part of the course (e.g., programming exercises in python) the following school grade:

n=12

“Ungenügend” / Unsatisfactory (6)	0%
“Mangelhaft” / Deficient (5)	0%
“Ausreichend” / Sufficient (4)	0%
“Befriedigend” / Satisfactory (3)	0%
“Gut” / Good (2)	50%
“Sehr gut” / Very good (1)	50%

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

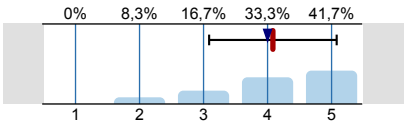
Do not agree at all — Fully agree



n=11
mw=4,6
md=5
s=0,5
E.=1

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

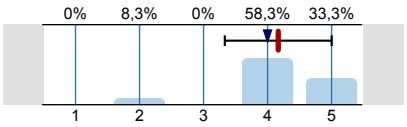
Do not agree at all — Fully agree



n=12
mw=4,1
md=4
s=1

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

Do not agree at all — Fully agree

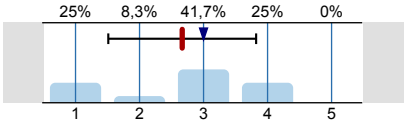


n=12
mw=4,2
md=4
s=0,8

2. Evaluation of Learning Objectives

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

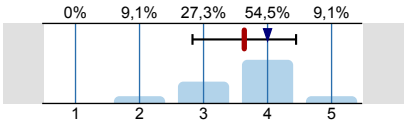
Very low — Very high



n=12
mw=2,7
md=3
s=1,2

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

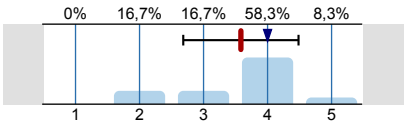
Very low — Very high



n=11
mw=3,6
md=4
s=0,8

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

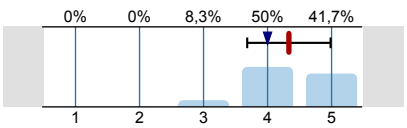
Very low — Very high



n=12
mw=3,6
md=4
s=0,9

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

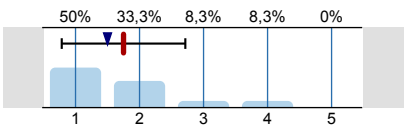
Very low — Very high



n=12
mw=4,3
md=4
s=0,7

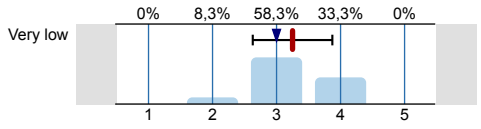
2.5) **I can explain gradient descent techniques.**
My skills in this area *before* starting the course were...

Very low — Very high



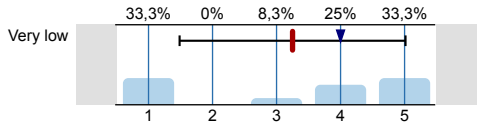
n=12
mw=1,8
md=1,5
s=1

2.6) **I can explain gradient descent techniques.**
My skills in this area are *now*...



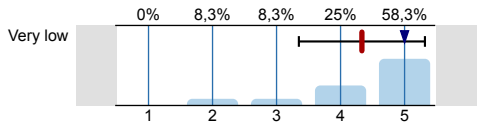
n=12
mw=3,3
md=3
s=0,6

2.7) **I can calculate descriptive statistics like mean, variance, and distribution in Python.**
My skills in this area *before* starting the course were...



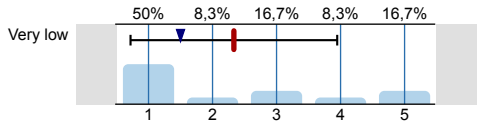
n=12
mw=3,3
md=4
s=1,8

2.8) **I can calculate descriptive statistics like mean, variance, and distribution in Python.**
My skills in this area are *now*...



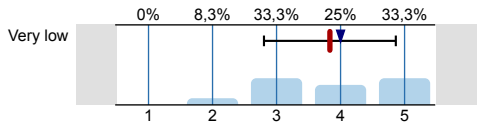
n=12
mw=4,3
md=5
s=1

2.9) **I can explain the concept of Eigenvalues and their importance for PCA.**
My skills in this area *before* starting the course were...



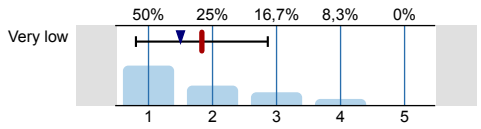
n=12
mw=2,3
md=1,5
s=1,6

2.10) **I can explain the concept of Eigenvalues and their importance for PCA.**
My skills in this area are *now*...



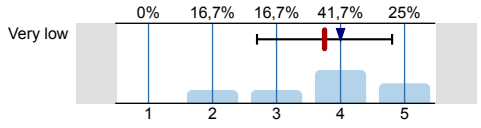
n=12
mw=3,8
md=4
s=1

2.11) **I can demonstrate how k-nearest neighbors algorithms work in Python.**
My skills in this area *before* starting the course were...



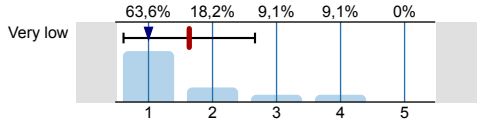
n=12
mw=1,8
md=1,5
s=1

2.12) **I can demonstrate how k-nearest neighbors algorithms work in Python.**
My skills in this area are *now*...



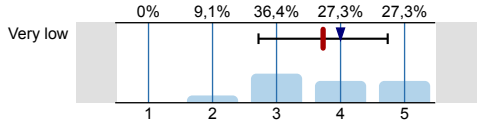
n=12
mw=3,8
md=4
s=1,1

2.13) **I can demonstrate how support vector machine algorithms work in Python.**
My skills in this area *before* starting the course were...



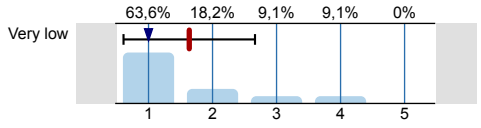
n=11
mw=1,6
md=1
s=1
E.=1

2.14) **I can demonstrate how support vector machine algorithms work in Python.**
My skills in this area are *now*...



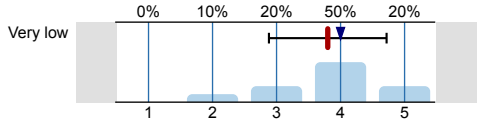
n=11
mw=3,7
md=4
s=1
E.=1

2.15) **I can demonstrate how decision tree and random forest algorithms work in Python.**
My skills in this area *before* starting the course were...



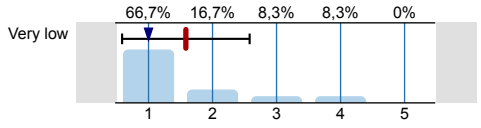
n=11
mw=1,6
md=1
s=1
E.=1

2.16) **I can demonstrate how decision tree and random forest algorithms work in Python.**
My skills in this area are *now*...



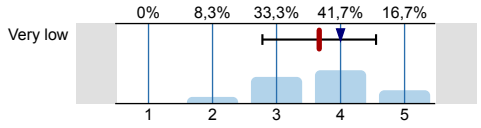
n=10
mw=3,8
md=4
s=0,9
E.=2

2.17) **I can demonstrate how k-means algorithms work in Python.**
My skills in this area *before* starting the course were...



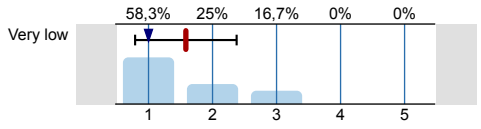
n=12
mw=1,6
md=1
s=1

2.18) **I can demonstrate how k-means algorithms work in Python.**
My skills in this area are *now*...



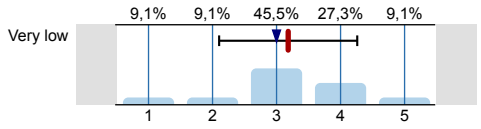
n=12
mw=3,7
md=4
s=0,9

2.19) **I can explain the concept of Gaussian mixture models.**
My skills in this area *before* starting the course were...



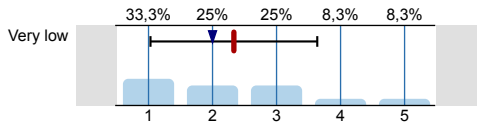
n=12
mw=1,6
md=1
s=0,8

2.20) **I can explain the concept of Gaussian mixture models.**
My skills in this area are *now*...



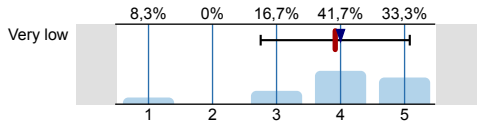
n=11
mw=3,2
md=3
s=1,1
E.=1

2.21) **I can use PCA for dimensionality reduction in Python.**
My skills in this area *before* starting the course were...



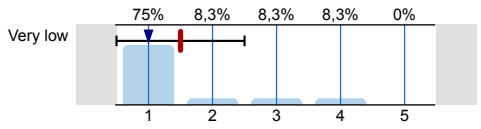
n=12
mw=2,3
md=2
s=1,3

2.22) **I can use PCA for dimensionality reduction in Python.**
My skills in this area are *now*...



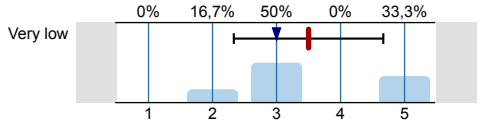
n=12
mw=3,9
md=4
s=1,2

2.23) **I can explain the concepts of feedforward neural networks and convolutional neural networks.**
My skills in this area *before* starting the course were...



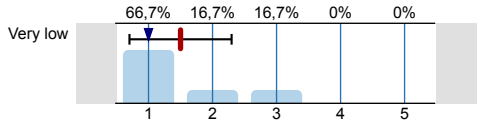
n=12
mw=1,5
md=1
s=1

2.24) **I can explain the concept of feedforward neural networks and convolutional neural networks.**
My skills in this area are *now*...



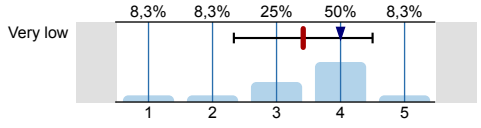
n=12
mw=3,5
md=3
s=1,2

2.25) **I can demonstrate the training process of simple neural networks in Python.**
My skills in this area *before* starting the course were...



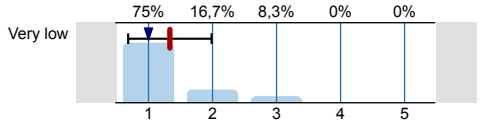
n=12
mw=1,5
md=1
s=0,8

2.26) **I can demonstrate the training process of simple neural networks in Python.**
My skills in this area are *now*...



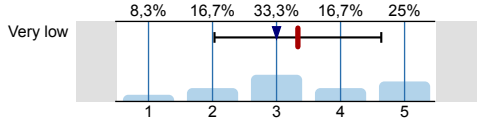
n=12
mw=3,4
md=4
s=1,1

2.27) **I can explain the link between convolutional neural networks and cross correlation.**
My skills in this area *before* starting the course were...



n=12
mw=1,3
md=1
s=0,7

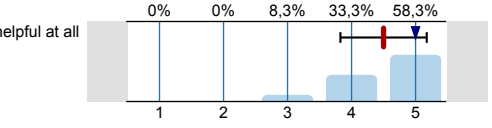
2.28) **I can explain the link between convolutional neural networks and cross correlation.**
My skills in this area are *now*...



n=12
mw=3,3
md=3
s=1,3

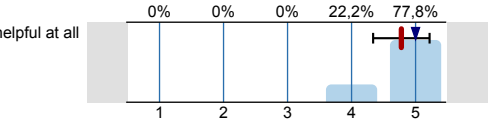
3. Questions about the course (2)

3.1) Was GitHub a helpful tool for conducting the course?



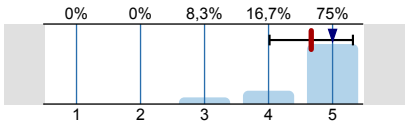
n=12
mw=4,5
md=5
s=0,7

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



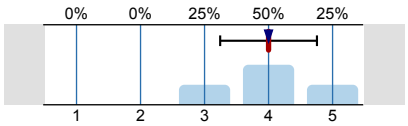
n=9
mw=4,8
md=5
s=0,4
E.=3

3.3) Did you find the use of PyTorch for deep learning useful?



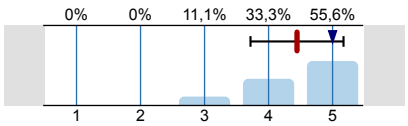
n=12
mw=4,7
md=5
s=0,7

3.4) How helpful was the topic "**Brain Decoding**" in teaching relevant machine learning skills? (on day 12)



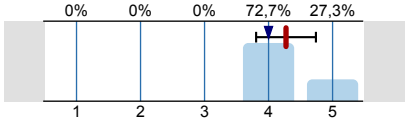
n=8
mw=4
md=4
s=0,8
E.=4

3.5) How helpful was the topic "**Medical Image Segmentation**" in teaching relevant machine learning skills? (on day 13)



n=9
mw=4,4
md=5
s=0,7
E.=3

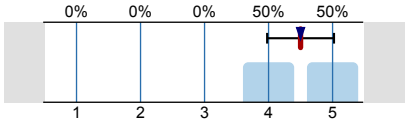
3.6) How helpful was the topic "**Implementing multi-head attention for language modelling**" in teaching relevant machine learning skills? (on day15)



n=11
mw=4,3
md=4
s=0,5
E.=1

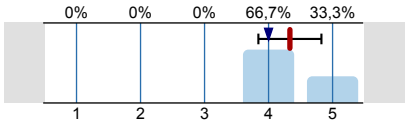
4. Questions about the course (3)

4.1) The course follows a clear structure.



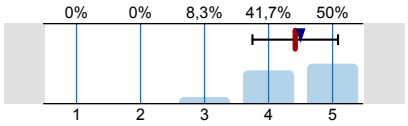
n=12
mw=4,5
md=4,5
s=0,5

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



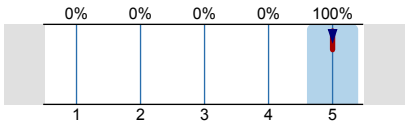
n=12
mw=4,3
md=4
s=0,5

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



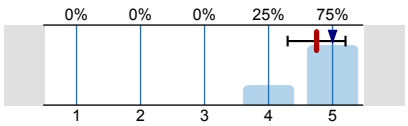
n=12
mw=4,4
md=4,5
s=0,7

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



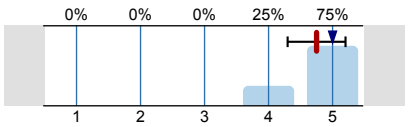
n=12
mw=5
md=5
s=0

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



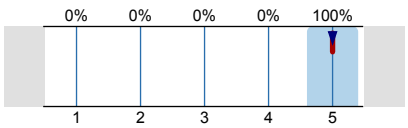
n=12
mw=4,8
md=5
s=0,5

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



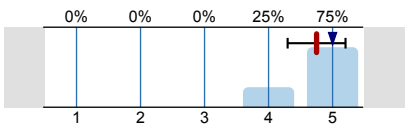
n=12
mw=4,8
md=5
s=0,5

4.7) The instructors have good time management skills.



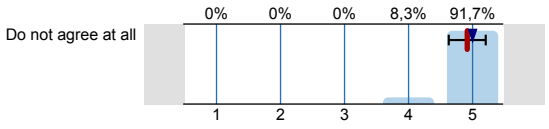
n=12
mw=5
md=5
s=0

4.8) The instructors express themselves clearly and comprehensively.



n=12
mw=4,8
md=5
s=0,5

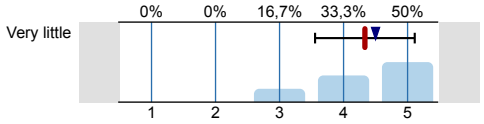
4.9) The instructors encourage active student participation in the course.



n=12
mw=4,9
md=5
s=0,3

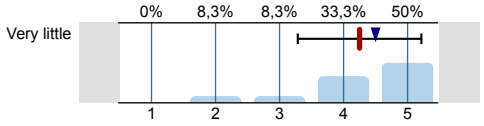
5. Questions about the course (4)

5.1) How much did you learn in this course?



n=12
mw=4,3
md=4,5
s=0,8

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



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

6. Participant statistics

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

n=12

Yes	25%
No, because I had no time/interest	8,3%
No, because I already had Python skills	66,7%
No, for another reason	0%

6.2) What is your highest educational qualification?

n=12

High school diploma / Baccalaureate / “Abitur”	0%
Bachelor (or comparable)	0%
Master (or comparable)	58,3%
PhD / “Doctorate”	33,3%
Habilitation / Professorship	0%
None of the above	8,3%

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

n=12

Took personal vacation time / time off work	16,7%
My employer/supervisor let me take the course during my working hours	58,3%
Took educational leave ("Bildungsurlaub")	0%
Took the course in addition to my usual workload (e.g., working in the morning/evening)	8,3%
Other / a combination of the above	16,7%

6.5) To which gender identity do you most identify?

n=12

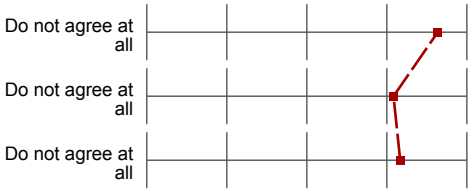
Female	16,7%
Male	75%
Other / Diverse	8,3%
Prefer not to answer	0%

Profillinie

Teilbereich: Institut für Medizindidaktik
Name der/des Lehrenden: Dr. Matthias Carl Laupichler
Titel der Lehrveranstaltung: (Name der Umfrage) ML Foundations (09/25)

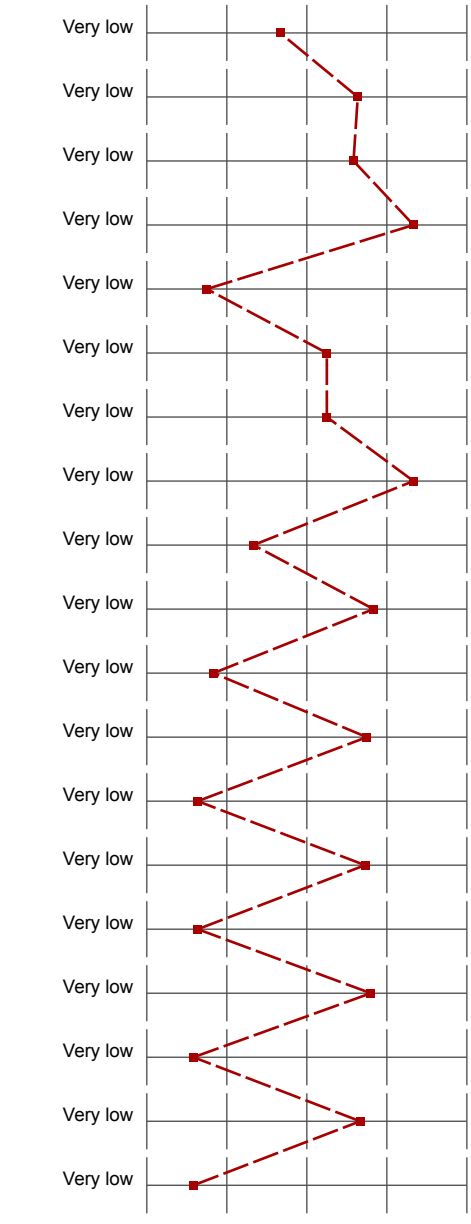
Verwendete Werte in der Profillinie: Mittelwert

1. Questions about the course (1)



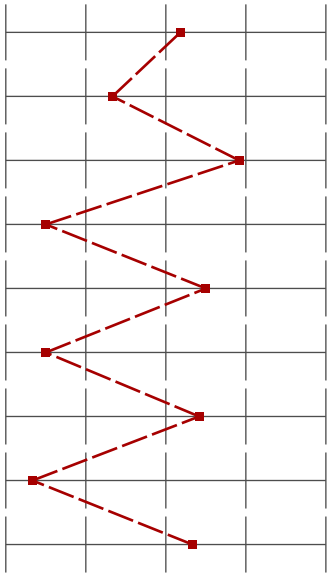
1.7)	The course is useful for conducting my research projects.	Do not agree at all	Fully agree	n=11	mw=4,6	md=5	s=0,5
1.8)	I can use what I have learned independently in my research projects.	Do not agree at all	Fully agree	n=12	mw=4,1	md=4	s=1
1.9)	The amount of examples in the course was appropriate.	Do not agree at all	Fully agree	n=12	mw=4,2	md=4	s=0,8

2. Evaluation of Learning Objectives



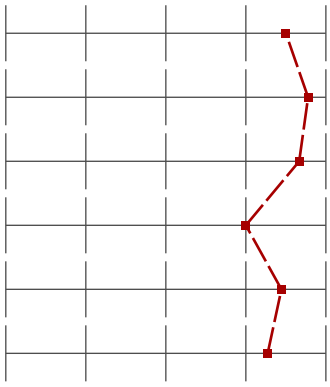
2.1)	**Python programming (in general):** My skills in this area *before* starting the course were...	Very low	Very high	n=12	mw=2,7	md=3	s=1,2
2.2)	**Python programming (in general):** My skills in this area are *now*...	Very low	Very high	n=11	mw=3,6	md=4	s=0,8
2.3)	**I can use the Linux terminal/console.** My skills in this area *before* starting the course were...	Very low	Very high	n=12	mw=3,6	md=4	s=0,9
2.4)	**I can use the Linux terminal/console.** My skills in this area are *now*...	Very low	Very high	n=12	mw=4,3	md=4	s=0,7
2.5)	**I can explain gradient descent techniques.** My skills in this area *before* starting the course were...	Very low	Very high	n=12	mw=1,8	md=1,5	s=1
2.6)	**I can explain gradient descent techniques.** My skills in this area are *now*...	Very low	Very high	n=12	mw=3,3	md=3	s=0,6
2.7)	**I can calculate descriptive statistics like mean, variance, and distribution in Python.** My skills in this area *before* starting the course	Very low	Very high	n=12	mw=3,3	md=4	s=1,8
2.8)	**I can calculate descriptive statistics like mean, variance, and distribution in Python.** My skills in this area are *now*...	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 *before* starting the course	Very low	Very high	n=12	mw=2,3	md=1,5	s=1,6
2.10)	**I can explain the concept of Eigenvalues and their importance for PCA.** My skills in this area are *now*...	Very low	Very high	n=12	mw=3,8	md=4	s=1
2.11)	**I can demonstrate how k-nearest neighbors algorithms work in Python.** My skills in this area *before* starting the course	Very low	Very high	n=12	mw=1,8	md=1,5	s=1
2.12)	**I can demonstrate how k-nearest neighbors algorithms work in Python.** My skills in this area are *now*...	Very low	Very high	n=12	mw=3,8	md=4	s=1,1
2.13)	**I can demonstrate how support vector machine algorithms work in Python.** My skills in this area *before* starting the course	Very low	Very high	n=11	mw=1,6	md=1	s=1
2.14)	**I can demonstrate how support vector machine algorithms work in Python.** My skills in this area are *now*...	Very low	Very high	n=11	mw=3,7	md=4	s=1
2.15)	**I can demonstrate how decision tree and random forest algorithms work in Python.** My skills in this area *before* starting the course	Very low	Very high	n=11	mw=1,6	md=1	s=1
2.16)	**I can demonstrate how decision tree and random forest algorithms work in Python.** My skills in this area are *now*...	Very low	Very high	n=10	mw=3,8	md=4	s=0,9
2.17)	**I can demonstrate how k-means algorithms work in Python.** My skills in this area *before* starting the course	Very low	Very high	n=12	mw=1,6	md=1	s=1
2.18)	**I can demonstrate how k-means algorithms work in Python.** My skills in this area are *now*...	Very low	Very high	n=12	mw=3,7	md=4	s=0,9
2.19)	**I can explain the concept of Gaussian mixture models.** My skills in this area *before* starting the course	Very low	Very high	n=12	mw=1,6	md=1	s=0,8

2.20)	**I can explain the concept of Gaussian mixture models.** My skills in this area are *now*...	Very low	Very high	n=11	mw=3,2	md=3	s=1,1
2.21)	**I can use PCA for dimensionality reduction in Python.** My skills in this area *before* starting the course	Very low	Very high	n=12	mw=2,3	md=2	s=1,3
2.22)	**I can use PCA for dimensionality reduction in Python.** My skills in this area are *now*...	Very low	Very high	n=12	mw=3,9	md=4	s=1,2
2.23)	**I can explain the concepts of feedforward neural networks and convolutional neural networks.**	Very low	Very high	n=12	mw=1,5	md=1	s=1
2.24)	**I can explain the concept of feedforward neural networks and convolutional neural networks.**	Very low	Very high	n=12	mw=3,5	md=3	s=1,2
2.25)	**I can demonstrate the training process of simple neural networks in Python.** My skills in this area *before* starting the course	Very low	Very high	n=12	mw=1,5	md=1	s=0,8
2.26)	**I can demonstrate the training process of simple neural networks in Python.** My skills in this area are *now*...	Very low	Very high	n=12	mw=3,4	md=4	s=1,1
2.27)	**I can explain the link between convolutional neural networks and cross correlation.** My skills in this area *before* starting the course	Very low	Very high	n=12	mw=1,3	md=1	s=0,7
2.28)	**I can explain the link between convolutional neural networks and cross correlation.** My skills in this area are *now*...	Very low	Very high	n=12	mw=3,3	md=3	s=1,3



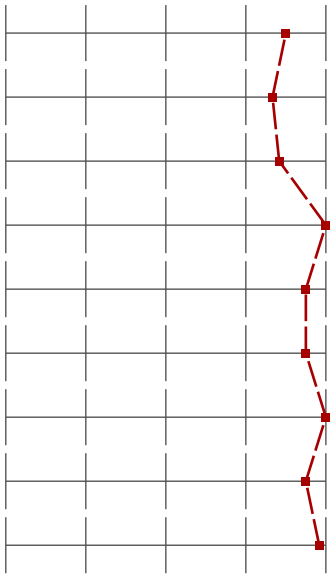
3. Questions about the course (2)

3.1)	Was GitHub a helpful tool for conducting the course?	Not helpful at all	Very helpful	n=12	mw=4,5	md=5	s=0,7
3.2)	Was the introduction to the HPC-Cluster helpful?	Not helpful at all	Very helpful	n=9	mw=4,8	md=5	s=0,4
3.3)	Did you find the use of PyTorch for deep learning useful?	Not useful at all	Very useful	n=12	mw=4,7	md=5	s=0,7
3.4)	How helpful was the topic "**Brain Decoding**" in teaching relevant machine learning skills? (on day 12)	Not helpful at all	Very helpful	n=8	mw=4	md=4	s=0,8
3.5)	How helpful was the topic "**Medical Image Segmentation**" in teaching relevant machine learning skills? (on day 13)	Not helpful at all	Very helpful	n=9	mw=4,4	md=5	s=0,7
3.6)	How helpful was the topic "**Implementing multi-head attention for language modelling**" in teaching relevant machine learning skills?	Not helpful at all	Very helpful	n=11	mw=4,3	md=4	s=0,5



4. Questions about the course (3)

4.1)	The course follows a clear structure.	Do not agree at all	Fully agree	n=12	mw=4,5	md=4,5	s=0,5
4.2)	The way the course is designed adds to the understanding of the material.	Do not agree at all	Fully agree	n=12	mw=4,3	md=4	s=0,5
4.3)	The course has a good mix of knowledge transfer, interactive elements and discussion.	Do not agree at all	Fully agree	n=12	mw=4,4	md=4,5	s=0,7
4.4)	The instructors are responsive to students' questions and suggestions.	Do not agree at all	Fully agree	n=12	mw=5	md=5	s=0
4.5)	The instructors clarify the usability and usefulness of the course content.	Do not agree at all	Fully agree	n=12	mw=4,8	md=5	s=0,5
4.6)	The instructors use good teaching materials (e. g., slides, presentations, bibliography, script) to support the learning process.	Do not agree at all	Fully agree	n=12	mw=4,8	md=5	s=0,5
4.7)	The instructors have good time management skills.	Do not agree at all	Fully agree	n=12	mw=5	md=5	s=0
4.8)	The instructors express themselves clearly and comprehensively.	Do not agree at all	Fully agree	n=12	mw=4,8	md=5	s=0,5
4.9)	The instructors encourage active student participation in the course.	Do not agree at all	Fully agree	n=12	mw=4,9	md=5	s=0,3



5. Questions about the course (4)

5.1)	How much did you learn in this course?	Very little		Very much	n=12	mw=4,3	md=4,5 s=0,8
5.2)	How interested were you in the topic ***before*** the course began?	Very little		Very much	n=12	mw=4,3	md=4,5 s=1

Auswertungsteil der offenen Fragen

5. Questions about the course (4)

5.3) What did you like most about the course?

- # The range of the explored concepts is very broad, allowing the students to have access to multiple possibilities of applicability of the lessons in their personal projects.
  # The attention and patience of the lectures and tutors is a great hallmark of the course. Everyone always made sure that our questions were properly approached and answered with clarity.
  # The exercises have well-defined goals and are focused on a clear progression of understanding of the functions. Since we had limited time on-site, the availability of the solutions is also a plus, so we can revisit our code and find the breaking points of improvement.
  # I felt personally motivated to interact more with the Computer Science Department on an academic level, since I was shown that they are always open for scientific collaborations. I work in a multidisciplinary research group and I will actively foster interactions between our teams!
- * the 1:1 support during exercise
  * that the exercises are done the full way from github back to github.
- + The concept of getting to know everyday new topics (daily structure: lecture | exercises)
  + getting in touch directly via coding and using hpc-resources
  + Enthusiastic presentation of the topics
  + Encouragement of [head]tutors
- enthusiasm of the tutors, covering all important concepts, better understanding of the general concepts of ML (although some math is too complicated for me), gives a great start for future ML application in my research
- Good structure by starting with theoretical background followed by exercises and real world application examples. The instructors were very kind and helpful and explained solutions to problems.
- In-depth coverage of the basics, including the maths and algorithms behind the standard scikit-learn and PyTorch functions; the enthusiasm and expertise of the instructors; the structure of theory and subsequent practical exercises
- Instructors and tutors => how responsive and helpful they are.
- I really liked how in depth the lectures were and how helpful the teachers were assisting during the exercises.
- The general idea of applications was given with joy and excitement. The students can get inspired by the tutors.

  Furthermore, the topics are quite important for nowadays.
- The very insightful lectures including the disussions with participants. The very friendly and encouraging and helpful lecturers and tutors. Thank you very much!

5.4) What could be improved about this course?

- # The course could be longer (more days), so we could have more time to break down the harder concepts. Alternatively, the lectures/ classes could be planned for the entire morning, leaving the afternoon for coding practice.
  # Assuming that the audience is mostly composed of graduate students, I would suggest a "Machine Learning Pitch" in the last day of the program, where the students would bring an brief application of a concept from the course into a open question from their own field. It does not need to be directly related to their personal projects, but it would help to build a interdisciplinary bridge, displaying the added value to the course.
- A bit more emphasis on applicability.
- A bit more time on Pytorch. The jump is a bit fast.
- Add a short demo block / introduction right before the first exercise in which PyTorch is used
- A little more background and/or intro to Scikit-Learn and PyTorch, how these frameworks work in general. Perhaps a short introduction? Perhaps a short section/discussion about the exercise solutions in the afternoon? Alternatively, a little more guidance/ more steps for solving the exercises. In general, they were adequate but if one hesitates to ask the tutors it was sometimes difficult to get started (especially if one is not familiar with Scikit-Learn and PyTorch).
- Despite two and a half weeks are quite some time, the course was very packed. It was hard to catch up with everything as working on a bigger exercise like a neural network exceeded the time limit of one day. Although it was possible to work on an exercise on the following day, it meant to lose or miss time for the exercise of the next day.
- Discussion section for some exercises AFTER they are done (maybe 30min at the end of the day could be enough):
  Point out tricky parts, different solutions to overcome obstacles... etc
  (just critics on high level)
- I think going over some of the more obscure notation or ones that change between topics would be helpful.

- some exercises could have a clearer structure (when to do which TODOs)
- You need significantly more prior knowledge of mathematics to follow the lecture and the principles.
  Students can either teach themselves this as needed or take a separate course.

  Depending on the target audience, it is not absolutely necessary to cover the mathematical basics in depth in order to understand the material.

  The same applies to Python and programming. If you only have beginner's knowledge, you will often lack the understanding needed to complete the tasks.

6. Participant statistics

6.3) What is your main field of research?

- Atmospheric Science
- Computational Biology
- Computational Neuroscience (2 Nennungen)
- Immunology
- Immunology, Biomedicine
- law/tax
- Life Sciences
- Linguistics
- medicine
- Neuroscience
- Physics

6.6) What is your age (in years)?

- 25
- 28
- 29 (2 Nennungen)
- 30
- 31
- 33 (2 Nennungen)
- 34
- 38
- 49