

## Machine Learning

The purpose of the questionnaire is to determine your experience studying machine learning.

It is already established that machine learning is a difficult topic to learn, however limited research has been undertaken which identifies the barriers that students face when learning this area of computer science and possible strategies to aid with the comprehension of this domain. This study aims, through communication with students who have, and are currently undertaking a machine learning course to identify specific aspects of knowledge within machine learning which are the most difficult to grasp.

By filling in this survey you are consenting to this data being utilised for the purposes of this study. The data obtained from this questionnaire will be anonymous and will only be viewed by researchers involved within this study at Newcastle University.

If you require any additional information, please contact B.Allen2@newcastle.ac.uk

When starting the machine learning module, how would you describe your level of maths attainment?

- ☐ Studied maths up to GCSE level or equivalent
- ☐ Studied maths up to A-Level or equivalent
- ☐ Maths was a major part of my first degree
- ☐ My first degree was in maths

On a scale of 1-5 how challenging were these topics on the machine learning module?

(5 = most challenging)

	1	2	3	4	5
Maths for machine learning (e.g. probability, statistics)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data representation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Linear regression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backpropagation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5
Traditional supervised and unsupervised models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deep Learning (e.g. MLP, CNN, RNN)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dimensionality reduction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performance metrics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other

Please select the topics of machine learning which you are still unsure on?

Maths for machine learning (e.g. probability, statistics)	<input type="radio"/>
Data representation	<input type="radio"/>
Linear regression	<input type="radio"/>
Backpropagation	<input type="radio"/>
Traditional supervised and unsupervised models	<input type="radio"/>
Deep Learning (e.g. MLP, CNN, RNN)	<input type="radio"/>
Dimensionality reduction	<input type="radio"/>
Performance metrics	<input type="radio"/>

Other

Which aspect of the module did you find the most difficult?

- ☐ Theoretical subject knowledge / exam
- ☐ Practical exercises / coursework

Which resources did you use to aid your learning and how often did you use these?

	Never	Rarely	Sometimes	Often
Textbook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website (e.g. stack overflow)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online course (e.g. Coursera)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If other, please state what this resource was

On a scale of 1-5 how useful did you find the following resources?  
(5= very useful)

	1	2	3	4	5
Textbook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website (e.g. stack overflow)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online course (e.g. Coursera)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Which study strategies did you use?

Note taking	<input type="radio"/>
Practical exercises	<input type="radio"/>
Goal setting	<input type="radio"/>
Study group	<input type="radio"/>
Quizzes	<input type="radio"/>
Reflection	<input type="radio"/>
Other	<input type="radio"/>

If other, please state what this study strategy was

On a scale of 1-5 how useful would you describe these study strategies?  
(5 = very useful)

	1	2	3	4	5
Note taking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practical exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Goal setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Study group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quizzes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reflection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On a scale of 1-5, how confident would you feel applying machine learning now?  
(5= very confident)

	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Any additional comments on your experience studying machine learning?

Age

- ☐ 18-22 years old
- ☐ 23-27 years old
- ☐ 28-32 years old
- ☐ 33-40 years old
- ☐ 40+ years old
- ☐ Prefer not to say

Gender

- ☐ Male
- ☐

Female

- ☐ Prefer not to say
- ☐ I prefer to self describe

### Data Protection Statement

The data obtained from this questionnaire will be anonymous and stored on a university access-controlled computer. The data will be stored until the end of the research project finishing in 2021.

Submit