

We would like to know how you generally think about algorithms.

Please indicate how much you agree with the following statements.

I think..	completely disagree	strongly disagree	somewhat disagree	undecided	somewhat agree	strongly agree	completely agree
algorithm-based decisions are not transparent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People could let themselves be determined by algorithms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms can make more precise decisions than a human.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
algorithm-based decisions are too uncertain for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms are not aware of the responsibility of a decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms prefer no one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms can relieve people of difficult decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms treat all people equally.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms are completely rational and therefore comprehensible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms can make decisions that no human should have to make.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
that certain decisions should only be made by people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms are less flexible than humans in evaluating decision factors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms can save decision makers a lot of work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms cannot be bribed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

that many people would simply follow algorithm-based recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
it is problematic that algorithms cannot be held responsible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms can process more data than a human.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms cannot consider the consequences of a decision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms can not be held responsible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms are not suitable for making personal decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms can analyze data faster than a human.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms apply the same scale to everyone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms should not make morally difficult decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms make decisions more responsibly than humans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
algorithm-based decisions are too impersonal for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations by an algorithm lead to people thinking less about decisions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms have no good and no bad days.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Algorithms have no prejudices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This algorithm was developed with the "ABCDE method" in mind. This is a common method for detecting melanoma by visual inspection. It can help both medical laypersons and clinicians to identify features in a skin lesion that could indicate melanoma.

Please read the following text carefully.

ABCDE Method

Asymmetry:

A stands for asymmetry. A melanocytic nevus (harmless mole) is usually symmetrical, while a melanoma often has an irregular or asymmetrical shape.

Border Irregularity:

B stands for Border Irregularity, i.e. irregularity at the border. A melanocytic nevus (harmless liver spot) has smooth and even edges, while a melanoma often has irregular and difficult to define edges.

Color Variation:

C stands for Color Variation. A melanocytic nevus (harmless mole) usually has a single shade or two shades, one entering the other or repeating regularly (generally pink, brown, or tan). Melanoma can be brown but can have up to five or six colors (blue, black, brown, tan, grey, pink, and red). These colors are unevenly or irregularly distributed.

Diameter greater than 6mm:

D stands for diameter. Most melanomas have a diameter of more than 6 mm when they are diagnosed.

Evolution:

E stands for Evolution or change. A melanocytic nevus (harmless mole) is usually stable and does not change in size, shape, or color, whereas a melanoma changes over time. Changes in size, color, shape, or structure can become noticeable over months to years.

1. The following are the diameters measured for spots on 5 different people for the diagnosis of Melanoma. Which is most likely to be a Melanoma based on the diameter?

- ☐ 4.0 mm
- ☐ 5.1 mm
- ☐ 6.9 mm
- ☐ 5.5 mm
- ☐ 3.6 mm

Please read the following task description carefully.

We would like to ask you to put yourself in the role of the treating dermatologist.

Based on the information available to you, you will decide how likely the birthmark could be melanoma and whether you would have a biopsy performed.

Below are some cases where you should make this decision. In the example below you can see that the following information is available to you:

- You can analyze the image of the melanoma using the well-known ABCDE formula.
- You can ask the patient whether the melanoma has changed over time in terms of color, shape or size.
- You can ask the patient whether there has been any itching or bleeding at the birthmark.

Example: Image of a birthmark for analysis with accompanying information



- The spot on the skin has slightly increased in size over the last four months (6.2mm to 6.6mm). It does not itch or bleed.

MANIPUL

In addition to the case descriptions you will receive a risk assessment of our algorithm in the following form:

The risk assessment algorithm predicts that there is a 20% probability that this mole is a melanoma.

This algorithm was developed by us to help dermatologists in the assessment of moles.

To this end, factors were first determined which are taken into account in the analysis by the algorithm. The following factors turned out to be particularly relevant:

The ABCDE formula:

A = Asymmetry

B = limitation

C = Colour (English colour)

D = diameter or dynamic

E = sublimity

changes of the birthmark regarding size, shape, colour

itching or bleeding from the birthmark

The next step was to choose a suitable model for the algorithm.

This model was then trained on a database consisting of 22,783 real cases from the dermatology clinics of the UKA and the other clinics of the Aachen city region.

One case consisted of a photo of the affected skin area, additional information about changes and symptoms and the decision made by a dermatologist.

The cases were divided into training data sets and verification data sets in a ratio of 80/20 before the training. So the algorithm was trained with 80% of the data sets. The remaining 20% were used to verify the performance of the algorithm.

Through this process a prediction accuracy of 86% was achieved. This means that the probability of the algorithm making a mistake is 14%. Thus, out of 100 moles, the algorithm would make an incorrect recommendation in 14 cases.

The error can either be due to the fact that the mole is biopsied even though there is no risk of melanoma and thus an unnecessary intervention has been performed. Or the error is that an existing melanoma is not detected and not treated.

2. If the algorithm were to evaluate 200 cases, how many errors would it likely make based on the information above?

☐

8

☐

14

☐

20

☐

28

☐

42

☐

80

3. How many real cases were used to train the algorithm?

☐

10000

☐

15153

☐

22783

☐

32782

☐

20145

☐

50000

4. How was the training and verification data from the cases split?

The following options are in format (training data : Verification data)

☐ 75% : 25%
 ☐ 80% : 20%
 ☐ 85% : 15%
 ☐ 60% : 40%
 ☐ 86% : 14%
 ☐ 90% : 10%

Seite 05
EXPEVAL

Please evaluate the information you have received about the algorithm:

The explanation was...

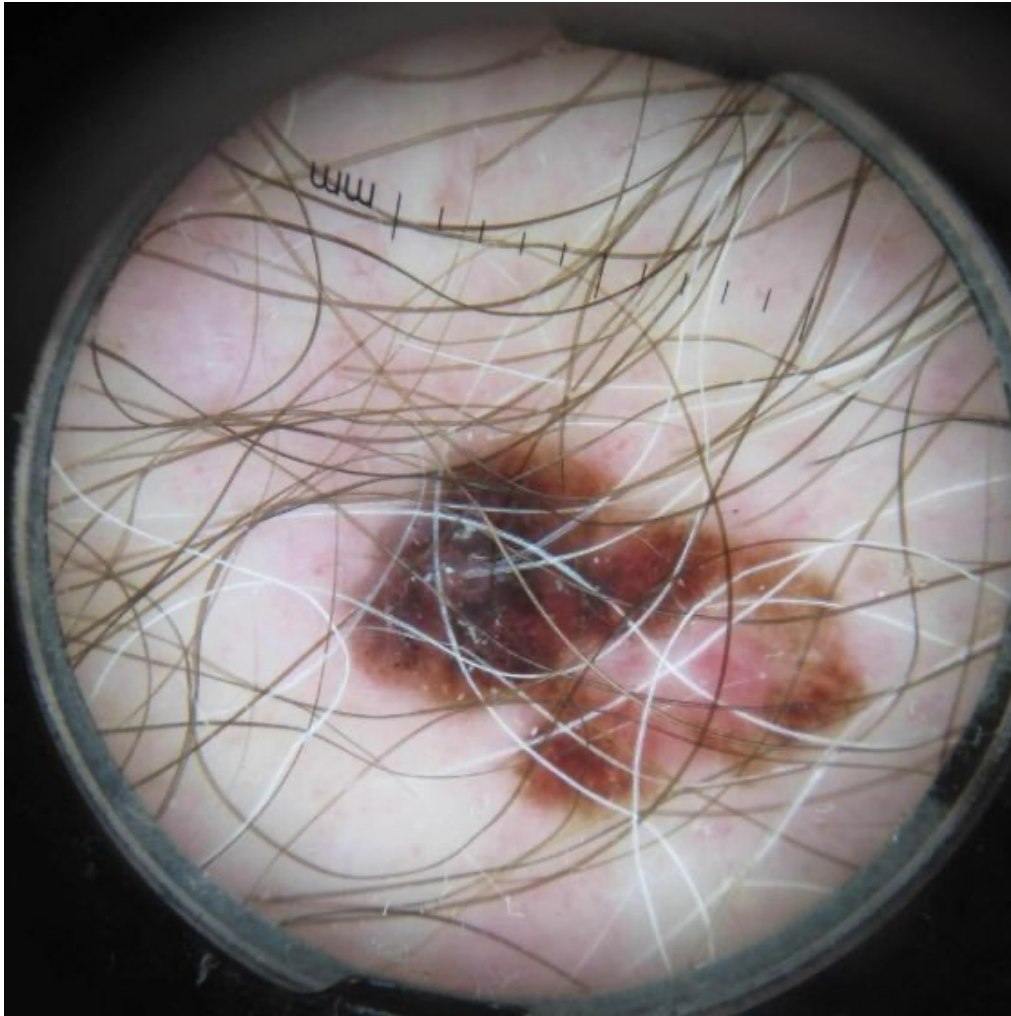
overwhelming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Underchallenging
uninformative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	informative
not useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	helpful
hard to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easily understandable
misleading	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unambiguous
not understandable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	understandable
very short	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	very long

Please indicate to what extent you agree with the following statements.

	completely disagree	strongly disagree	somewhat disagree	undecided	somewhat agree	strongly agree	completely agree
I think I know how to use the algorithm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think I know how the algorithm works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think I have a good grasp of the algorithm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Seite 06
CP1

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 84%.
- The spot on the skin has been growing in size and the borders of the spot are irregular.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma? (in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?☐Not at all
sure/sehr unsicher☐

Not sure/unsicher

☐

Moderate/moderat

☐

Sure/sicher

☐Very Sure/sehr
sicher**How reliable do you consider the recommendation of the algorithm to be?**☐Not at all
reliable/sehr
unzuverlässig☐Not Reliable/
unzuverlässig☐

Moderate/moderat

☐

Reliable/zuverlässig

☐Very Reliable/sehr
zuverlässig

Seite 07

CN1

Please look at the image and read the information given below carefully. And answer the following questions:

- Prediction from the Algorithmic Decision Making by AI for Melanoma: 12%.
- The spot on the skin has faded over time.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision

A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?

Not at all
sure/sehr unsicher



Not sure/unsicher



Moderate/moderat



Sure/sicher



Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?

Not at all
reliable/sehr
unzuverlässig



Not Reliable/
unzuverlässig



Moderate/moderat

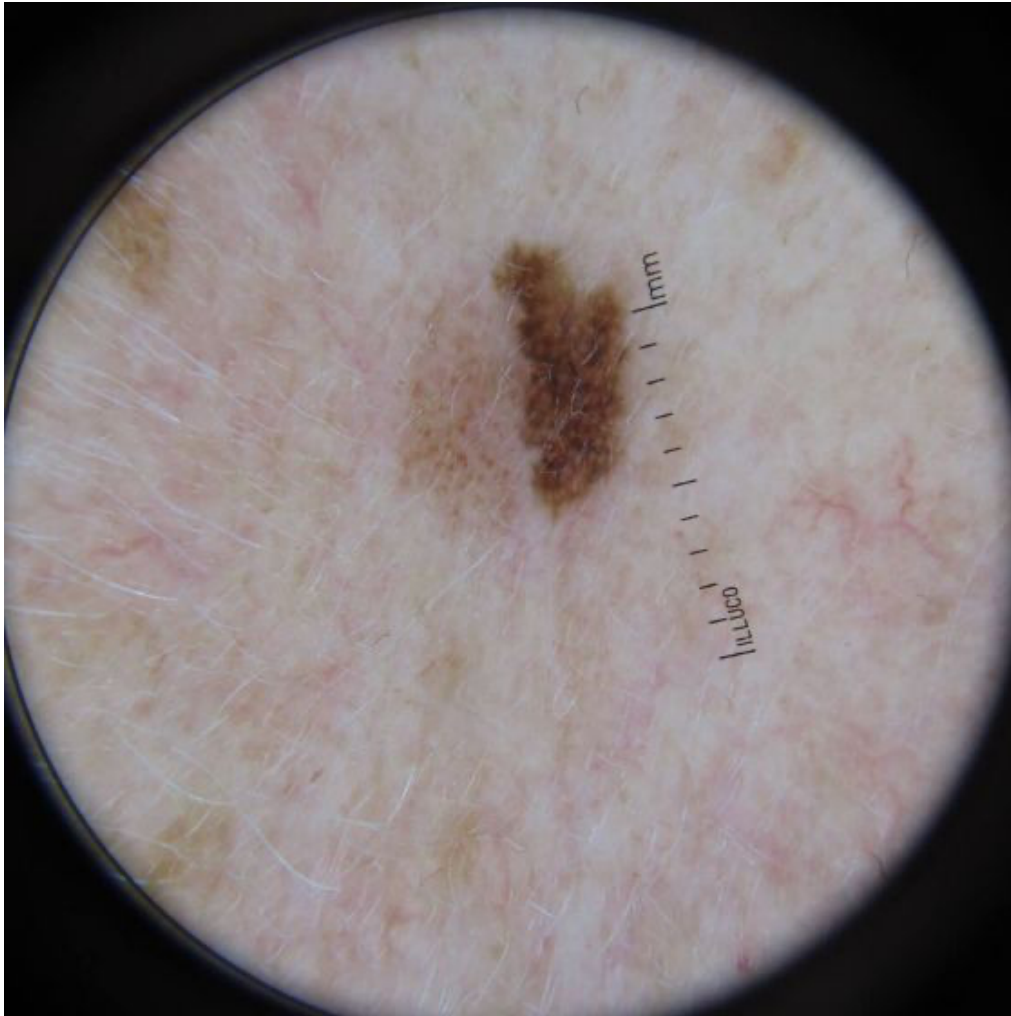


Reliable/zuverlässig



Very Reliable/sehr
zuverlässig

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 54%
- The spot on the skin has slightly increased in 4 months (6.2mm to 6.6mm).

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision

A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?

- ☐ Not at all sure/sehr unsicher ☐ Not sure/unsicher ☐ Moderate/moderat ☐ Sure/sicher ☐ Very Sure/sehr sicher

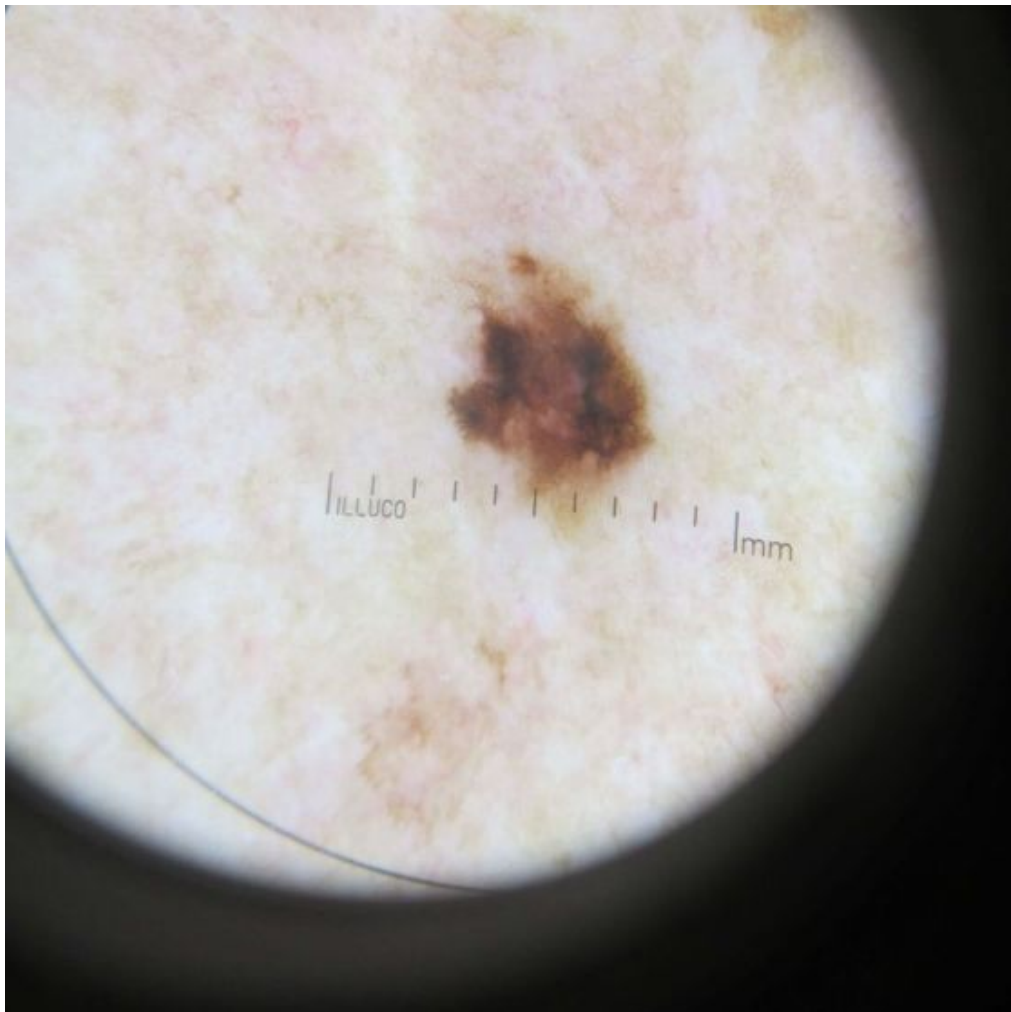
How reliable do you consider the recommendation of the algorithm to be?

- ☐ Not at all reliable/sehr unzuverlässig ☐ Not Reliable/unzuverlässig ☐ Moderate/moderat ☐ Reliable/zuverlässig ☐ Very Reliable/sehr zuverlässig

Seite 09

CP2

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 77%.
- The size of the spot is 7mm, and the color is brown. The spot is also itchy.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?



Not at all
sure/sehr unsicher



Not sure/unsicher



Moderate/moderat



Sure/sicher



Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?



Not at all
reliable/sehr
unzuverlässig



Not Reliable/
unzuverlässig



Moderate/moderat



Reliable/zuverlässig



Very Reliable/sehr
zuverlässig

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 6%
- No additional information was available for this case.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision

A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?

- ☐ Not at all sure/sehr unsicher ☐ Not sure/unsicher ☐ Moderate/moderat ☐ Sure/sicher ☐ Very Sure/sehr sicher

How reliable do you consider the recommendation of the algorithm to be?

- ☐ Not at all reliable/sehr unzuverlässig ☐ Not Reliable/unzuverlässig ☐ Moderate/moderat ☐ Reliable/zuverlässig ☐ Very Reliable/sehr zuverlässig

Seite 11

CN3

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 14%
- There is no irritation and no color variation, the size is less than 5mm.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?



Not at all
sure/sehr unsicher



Not sure/unsicher



Moderate/moderat



Sure/sicher



Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?



Not at all
reliable/sehr
unzuverlässig



Not Reliable/
unzuverlässig



Moderate/moderat



Reliable/zuverlässig



Very Reliable/sehr
zuverlässig

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 48%
- No additional information was available for this case.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision

A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?

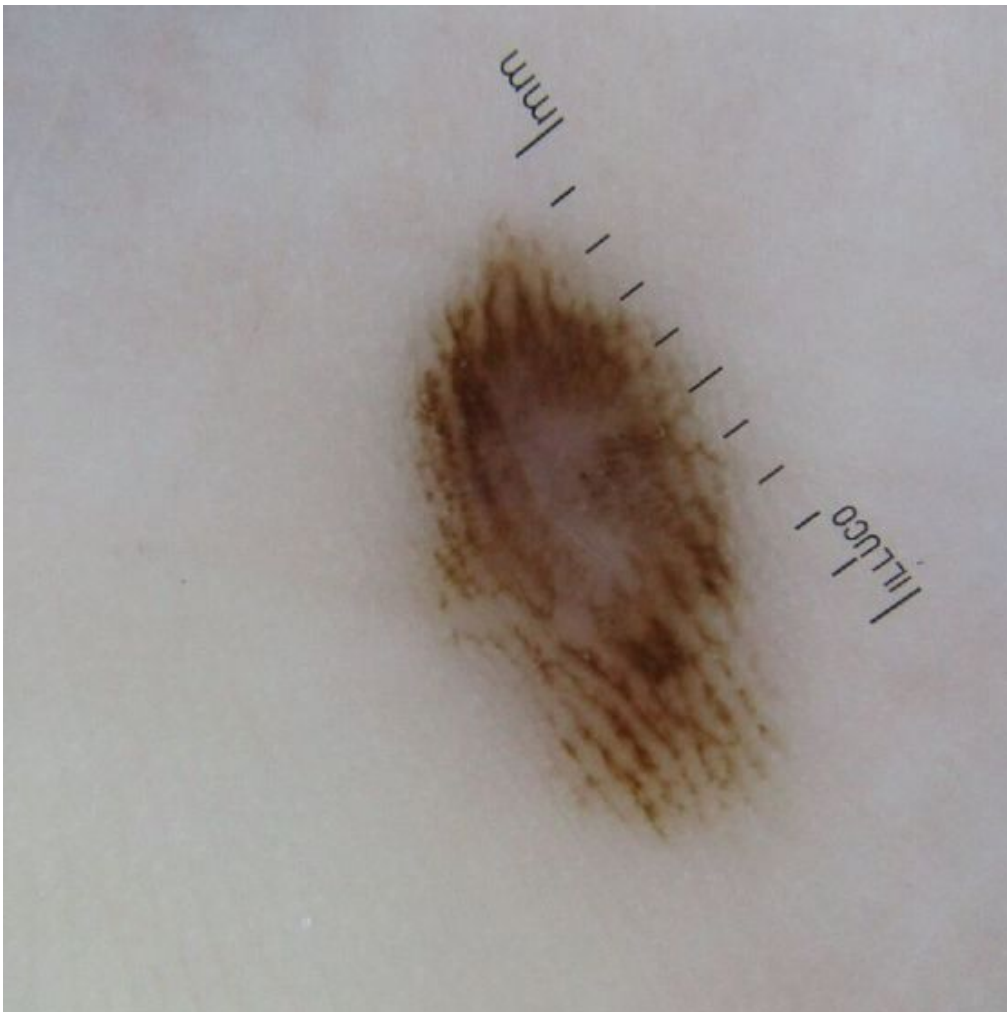
- ☐ Not at all sure/sehr unsicher ☐ Not sure/unsicher ☐ Moderate/moderat ☐ Sure/sicher ☐ Very Sure/sehr sicher

How reliable do you consider the recommendation of the algorithm to be?

- ☐ Not at all reliable/sehr unzuverlässig ☐ Not Reliable/unzuverlässig ☐ Moderate/moderat ☐ Reliable/zuverlässig ☐ Very Reliable/sehr zuverlässig

Seite 13**A3**

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 51%.
- The color of lesion has become darker over a period of 2 years.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?



Not at all
sure/sehr unsicher



Not sure/unsicher



Moderate/moderat



Sure/sicher



Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?



Not at all
reliable/sehr
unzuverlässig



Not Reliable/
unzuverlässig



Moderate/moderat

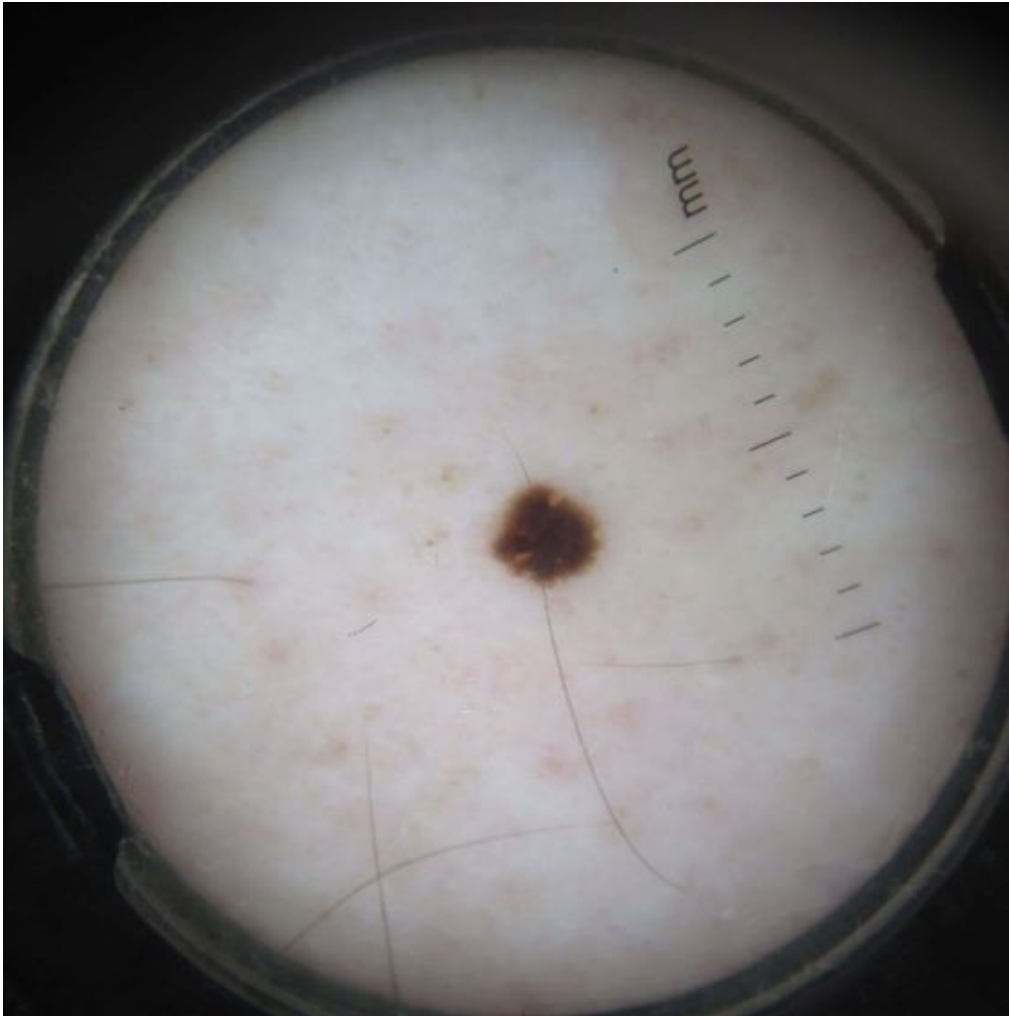


Reliable/zuverlässig



Very Reliable/sehr
zuverlässig

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 75%.
- The color of the lesion has become darker and the size has slightly grown.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?

- ☐ Not at all sure/sehr unsicher ☐ Not sure/unsicher ☐ Moderate/moderat ☐ Sure/sicher ☐ Very Sure/sehr sicher

How reliable do you consider the recommendation of the algorithm to be?

- ☐ Not at all reliable/sehr unzuverlässig ☐ Not Reliable/unzuverlässig ☐ Moderate/moderat ☐ Reliable/zuverlässig ☐ Very Reliable/sehr zuverlässig

Seite 15

CN4

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 23%.
- The spot has smooth even borders and the pigmented component fades towards outside.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?



Not at all
sure/sehr unsicher



Not sure/unsicher



Moderate/moderat



Sure/sicher



Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?



Not at all
reliable/sehr
unzuverlässig



Not Reliable/
unzuverlässig



Moderate/moderat

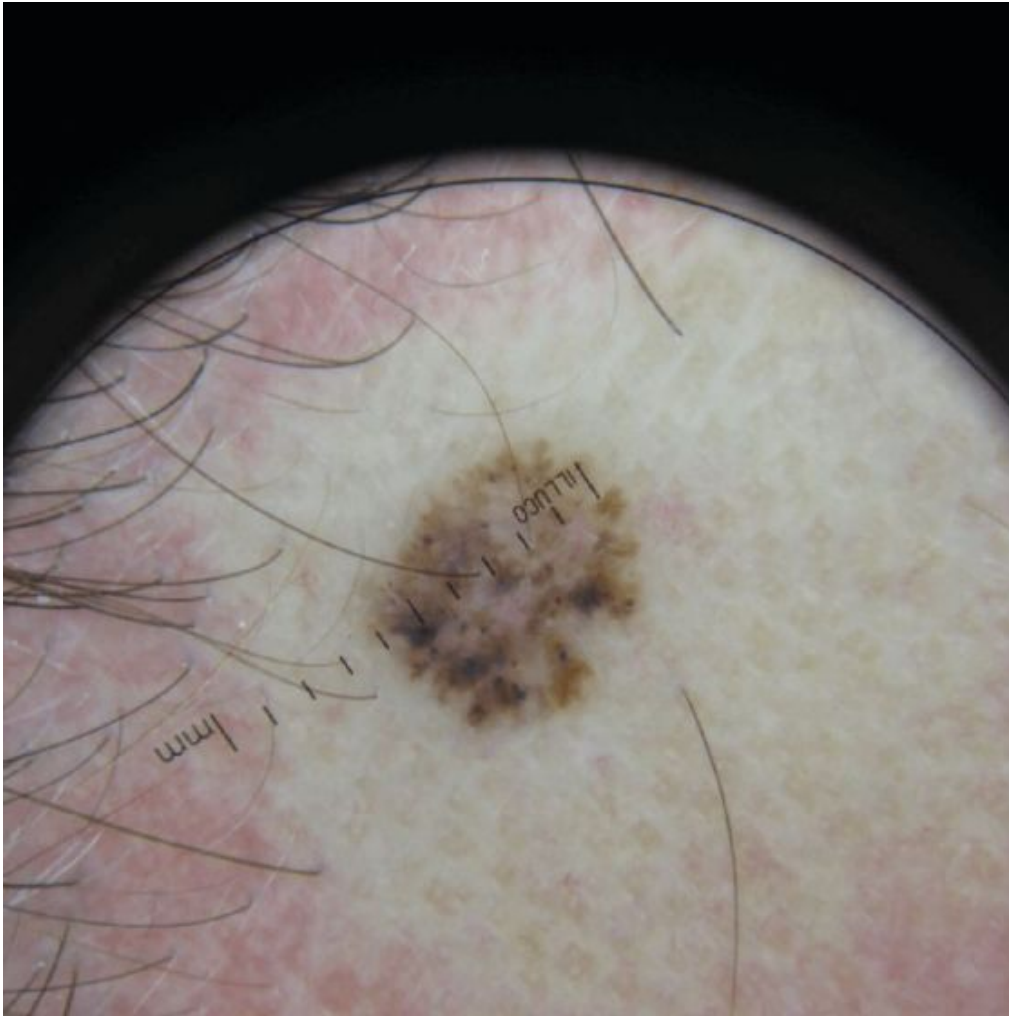


Reliable/zuverlässig



Very Reliable/sehr
zuverlässig

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 47%.
- The spot has an approximate diameter of 5.9mm

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?

- ☐ Not at all
sure/sehr unsicher
- ☐ Not sure/unsicher
- ☐ Moderate/moderat
- ☐ Sure/sicher
- ☐ Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?

- ☐ Not at all
reliable/sehr
unzuverlässig
- ☐ Not Reliable/
unzuverlässig
- ☐ Moderate/moderat
- ☐ Reliable/zuverlässig
- ☐ Very Reliable/sehr
zuverlässig

Seite 17**A5**

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 49%.
- The size of the spot on the skin hasn't grown for over 2 years, but it has irregular boundaries and dark color.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision



A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?



Not at all
sure/sehr unsicher



Not sure/unsicher



Moderate/moderat



Sure/sicher



Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?



Not at all
reliable/sehr
unzuverlässig



Not Reliable/
unzuverlässig



Moderate/moderat



Reliable/zuverlässig



Very Reliable/sehr
zuverlässig

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 96%.
- The spot has become firm and is continuously growing in size.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision

A biopsy should be performed on the patient



No biopsy should be performed on the patient.

How sure are you of your decision?

- ☐ Not at all sure/sehr unsicher ☐ Not sure/unsicher ☐ Moderate/moderat ☐ Sure/sicher ☐ Very Sure/sehr sicher

How reliable do you consider the recommendation of the algorithm to be?

- ☐ Not at all reliable/sehr unzuverlässig ☐ Not Reliable/unzuverlässig ☐ Moderate/moderat ☐ Reliable/zuverlässig ☐ Very Reliable/sehr zuverlässig

Seite 19

CN5

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 4%.
- No change in size, color, shape, or structure noted.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision☐

A biopsy should be performed on the patient

☐

No biopsy should be performed on the patient.

How sure are you of your decision?☐

Not at all
sure/sehr unsicher

☐

Not sure/unsicher

☐

Moderate/moderat

☐

Sure/sicher

☐

Very Sure/sehr
sicher

How reliable do you consider the recommendation of the algorithm to be?☐

Not at all
reliable/sehr
unzuverlässig

☐

Not Reliable/
unzuverlässig

☐

Moderate/moderat

☐

Reliable/zuverlässig

☐

Very Reliable/sehr
zuverlässig

Please look at the image and read the information given below carefully. And answer the following questions:



- Prediction from the Algorithmic Decision Making by AI for Melanoma: 97%.
- The spot has been itchy and shows no signs of healing. The skin has become darker around the spot, with blood clots forming around the spot.

Make a prediction

What, according to you, is the probability that the spot on skin in the image shown above is Melanoma?(in %)

0%

100%

Make a decision

☐

A biopsy should be performed on the patient

☐

No biopsy should be performed on the patient.

How sure are you of your decision?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all sure/sehr unsicher	Not sure/unsicher	Moderate/moderat	Sure/sicher	Very Sure/sehr sicher

How reliable do you consider the recommendation of the algorithm to be?

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not at all reliable/sehr unzuverlässig	Not Reliable/ unzuverlässig	Moderate/moderat	Reliable/zuverlässig	Very Reliable/sehr zuverlässig

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POSTSURVEY

You have now processed all 15 cases. Please answer the questions below.

Please indicate to what extent you agree with the following statements.

	completely disagree	strongly disagree	somewhat disagree	undecided	somewhat agree	strongly agree	completely agree
I think I know how the algorithm works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think I have a good grasp of the algorithm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think I know how to use the algorithm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	completely disagree	strongly disagree	disagree	undecided	agree	strongly agree	completely agree
I have largely ignored the algorithm in my decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The algorithm was very helpful in the decision making process.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have incorporated the recommendations of the algorithm into my decision-making process.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found the recommendations of the algorithm reasonable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The recommendations of the algorithm were in line with my assessment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The recommendations of the algorithm were easy to understand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my opinion the algorithm did not give good recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The algorithm made errors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The algorithm was unreliable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate how much you agree with the following :

“The decisions of algorithm influenced my decisions”

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strongly Disagree	Somewhat Disagree	Moderate	Somewhat Agree	Strongly agree

Please indicate how fair you consider the algorithm to be:

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very Unfair	Somewhat Unfair	Moderate	Somewhat Fair	Strongly Fair

I think it is good when decision-makers in the medical system receive assistance from algorithm-based recommendation systems.

Please indicate how much you agree with the following statement.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strongly Disagree	Somewhat Disagree	Moderate	Somewhat Agree	Strongly Agree

Algorithm-based recommendation systems are also used in many other areas. We have listed four of these use cases below.

Please sort them according to their severity. The most serious use case should be placed on rank 1.

There are two ways to sort the terms. Either (a) you drag the cards with the mouse to a free rank or (b) you click on them one after another with a double click.

*Triage = The prioritization of medical aid in case of resource shortage. Example: Who will receive life-sustaining treatments during the Covid-19 pandemic and who will not.

Diagnosis of skin cancer	Selection of applicants in a company	1
Decisions in the criminal justice system	Recommendations in a dating app	2
		3
Triage*		4
		5

Please sort the use cases now according to which case you would most likely agree to the use of a recommendation system.

Diagnosis of skin cancer	Selection of applicants in a company	1
Decisions in the criminal justice system	Recommendations in a dating app	2
		3
Triage*		4
		5

In the following, we would like to collect some demographic information

5. Please indicate your gender

6. Please indicate the age group you belong to.

7. In what setting did you learn the basics of the ABCDE method?

For example, course module name, event or training.

8. Please name the institution where you learned the basics of the ABCDE method.

For example, name of the university, clinic or practice.

9. Please indicate your field of study.

10. If you are currently studying, please indicate your study semester.

11. How would you rate your knowledge in the following areas?

Knowledge in the area of	non-existent	minimal	moderate	advanced	very advanced
Computer Science (general)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Machine Learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dermatology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Please state your general opinion on the use of algorithm-based recommendation systems.

I am more **in favor** of the use of algorithm-based recommendation systems.



I am rather **against** the use of algorithm-based recommendation systems.

Please give a short justification for your decision.

Why:

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DEB

Thank you very much!

Thank you for taking the time to participate in this survey.

At the end of the survey we would like to inform you about the background of our scientific question.

This study investigates to what extent people include the decision template of an algorithm in their own decision making. In this study we investigate the influence of:

- 1) little as opposed to detailed information about the algorithm on the probability that people will include the algorithm's recommendation in their decision making.
- 2) the reliability of the algorithm (algorithm makes no mistakes or makes mistakes) on the probability that people will include the algorithm's recommendation in their decision.

They were given detailed information and the algorithm made no mistakes.

To ensure that all study participants receive the same cases and recommendations, no real algorithm was used in this study. The cooperation with the Department of Computer Science of the RWTH Aachen University and the Department of Dermatology of the RWTH Aachen University does not exist and served to make the cases appear credible.

Even though no algorithm was developed in the context of this survey, algorithms of this kind exist with a very good prediction probability. Our investigation helps to find out how such systems can be used responsibly by experts in the future.

Should you discover conspicuous skin marks on yourself after this study, please contact your family doctor or a dermatologist.

If you have further questions about the content of this study, please send us an email with the subject "Question about the Derma Algorithm Study" to itec@humtec.rwth-aachen.de.

On the following page, you have the opportunity to participate in the lottery mentioned at the beginning of the survey. Thank you again for taking the time to support us in our research.

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LOT

- ☐ I would like to participate in the **lottery**. I agree that my e-mail address will be saved until the winner is drawn. My interview will continue to be anonymous and my email address will not be passed on to third parties.

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TEST

Letzte Seite

Thank you very much for your participation!

We would like to thank you very much for your support.

Your answers have been saved, you can now close the browser window.

[B.Sc. Sören Schöder](#), [B. Eng. Sourabh Zanwar](#), [Prof. Astrid Rosenthal-von der Pütten](#), RWTH Aachen