

Brain AI Survey

Welcome to the Brain AI Survey!

Study title: **A study to assess the clinical utility of artificial intelligence (AI) and explainable AI on brain tumor classification tasks**

We have an AI system that learns to predict a patient's diagnosis or prognosis from brain MRI.

We are interested in its clinical utility to physicians. Therefore, we would like to invite you to our study.

* 1. Are you a

- Resident Physician
- Fellow Physician
- Attending Physician
- Family Doctor
- Nurse Practitioner
- Registered Nurse
- Other (please specify)

* 2. Which medical specialty do you work in?

Neurosurgery (Adult or Pediatrics)

Neuro-radiology

Radiology

Family Medicine

Internal Medicine

Surgery

Ob & Gyn

General Pediatrics

Other (please specify)

Brain AI Survey

Study Consent

The study will take about **40 min**. You will be thanked with an Amazon gift card (\$50 CAD or equivalent value in your currency) to thank you for your time and effort in the study.

Before we proceed, please read the study consent form below, and decide if you would like to participate in the study.



Ethics Application No. [H20-03588]

PARTICIPANT CONSENT DOCUMENT

Title of Study: A usability study to assess the clinical utility of artificial intelligence and explainable artificial intelligence systems on brain tumor classification prediction tasks.

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1. Invitation and Study Purpose

We're inviting you to a usability study that aims to assess if and how AI (artificial intelligence) can be deployed clinically to assist doctors' clinical decision-making tasks. Although AI, especially deep learning technologies, have the potential to augment clinicians' abilities, its implementation in patient-care settings has not yet become widespread. As an initial step towards the clinical implementation of AI technologies, we deploy such technologies to mimic clinical judgment settings, and explore if and how AI would help with the clinical decision-support? If so, in what way? If not, what are the challenges and gaps in existing AI technologies when applying them in clinical tasks?

To participate in the study, you must **hold an MD; and must be a consultant neurosurgeon, radiologist, or neuro-radiologist, or a trainee in one of the medical specialties of neurosurgery, radiology, or neuro-radiology**.

Study Procedure

The study is conducted remotely. It consists of an online MRI reading survey (30-60 min).

In the **MRI reading survey**, you will read 25 MRI images of patients with glioma, and give your judgment on the tumor type. You will also indicate how confident you are in making the decisions. The MRI may be accompanied by different forms of AI assistance.

After the completion of the MRI reading survey, you will be thanked with a gift card or cash with an equivalent value of CAD \$50. For your convenience, the gift card or cash will be converted to the currency in your residence country.

Voluntary Participation

Your participation is voluntary. You have the right to refuse to participate in this study. You should not feel pressured to participate because of an existing relationship with the contacted colleague or the research team. If you decide to participate, you may still choose to withdraw from the study at any time without any negative consequences to the education, employment, or other services to which you are entitled or are presently receiving. To withdraw from the study, you can simply close the webpage if you're taking the online MRI reading survey,. You data collected will be removed from the study should you request it.

Potential Benefits

Although the study will not provide direct immediate benefits to you, the findings from the study should result in improved knowledge and understanding from healthcare professionals to inform the future design of AI systems that assist healthcare professionals' work.

Potential Risks

There are no foreseeable risks to participants or researchers.

The survey study will be conducted remotely using SFU SurveyMonkey Forms with SFU Computing ID account.

Although the SurveyMonkey application and data are hosted in Canada by a commercial provider external to SFU, the SurveyMonkey company is an US-owned company, and as



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such, is subject to the USA Patriot Act and CLOUD Act. These laws allow government authorities to access the records of host services and internet service providers. By choosing to participate, you understand that your participation in this study may become known to US federal agencies.

Confidentiality

Your confidentiality will be respected. Your personally identifiable information will not be recorded in the survey.

Your survey responses will be recorded anonymously using SurveyMonkey Forms with SFU computing ID account. The SurveyMonkey application and data are hosted in Canada by a commercial provider external to SFU. We will transfer the survey responses to a secure server located at SFU and delete the survey data on the host server. We retain the data for five years and will destroy all the records afterwards.

If you choose to contact the investigators about this study, we will not share your personal information, including your email address, with anyone. We will make our best effort to maintain the confidentiality of your communication with us, but be aware that email is not a secure mean to share confidential information.

Re-contact

In your post-survey email to receive the study compensation and to schedule the optional post-survey interview, we will ask for your approval to be re-contacted after the study session. We will re-contact you in case we require clarifications regarding any of the responses provided by you, and when the primary report or study publication draft is made available, so that you can provide feedback on the findings or results of the research.

Dissemination of Results

The primary manner to disseminate the study results is through manuscripts submitted for peer-review publications and conference presentations at various research communities in medicine or artificial intelligence. No personally identifiable information will be shared during the dissemination of results.

Participant Consent

Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. If you decide to take part in the study, you may choose to withdraw from the study

at any time without giving reasons. You understand the risks and benefits of your participation in this study.

- Your participation in this study is voluntary.
- You can decide to stop at any time, even part-way through the study for whatever reason.
- If you decide to stop participating, there will be no consequences to you.
- If you decide to stop, we will ask you if you would like us to destroy the collected data from this study.
- If you do not want to answer some of the questions you do not have to, but you can still be in the study.
- You do not waive any of your legal rights by participating in this study.
- If you have any questions about this study or would like more information you can call or email Dr. Ghassan Hamarneh at the contact information on the first page.

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, you may contact Dr. Jeffrey Toward, Director, Office of Research Ethics, Simon Fraser University, British Columbia, Canada, at jtoward@sfu.ca

Taking part in this study is entirely up to you. You have the right to refuse to participate in this study.

* 3. **Do you agree to participate in the study?**

Taking part in this study is entirely up to you. You have the right to refuse to participate in this study.

If you decide to take part in the study, you may choose to withdraw from the study at any time without giving reasons.

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, you may contact Dr. Jeffrey Toward, Director, Office of Research Ethics, Simon Fraser University, British Columbia, Canada, at jtoward@sfu.ca or +1 778-782-6593.

Yes, I agree to participate in the study

No, I will not participate in the study

Brain AI Survey

In this survey, you will read a set of 25 MRIs from patients with glioma, and give your judgment on the glioma grading: whether it is a **WHO Grade 4 glioblastoma**, or a **WHO Grade 2 or Grade 3 glioma**

You will have a well-trained AI system to assist your judgment.

* 4. Before starting the survey, what would be your initial trust level in this AI model?

-5, Totally distrust the AI 0, Neutral, neither distrust nor trust Totally trust the AI, 5

* 5. Overall, how likely will you incorporate this AI's suggestions into your routine clinical practices, such as diagnosis, prognosis, and medical management?

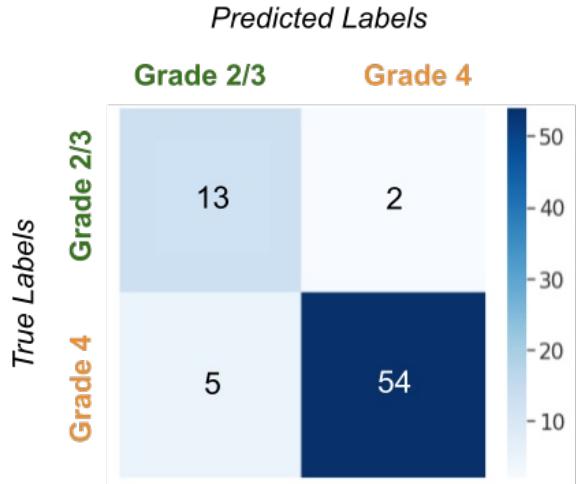
0, Not likely 5, Somewhat likely Very likely, 10

The prediction accuracy of the AI model is: **90%**.
(Accuracy for **Grade 2 or Grade 3 glioma**: 87%, for **Grade 4 glioblastoma**: 92%).

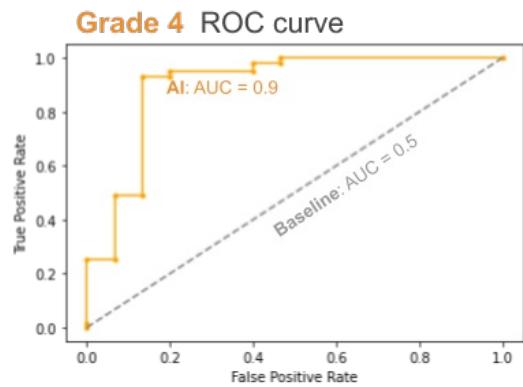
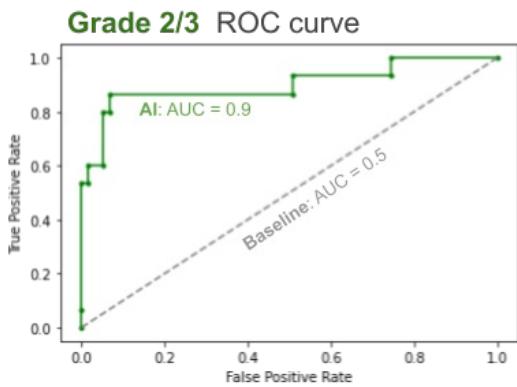
I.e.: given a new patient MRI, its prediction has a **90% likelihood of being correct**.

This performance is tested on a test set, which is a dataset of new patients that have never been used to train the AI model).

The AI's fine-grained performance metrics are shown below:



	Sensitivity	Specificity	Positive Predictive Value	F1 score	Number of class in the test set
Grade 2 or 3 glioma	0.87	0.92	0.72	0.79	15
Grade 4 glioblastoma	0.92	0.87	0.96	0.94	59



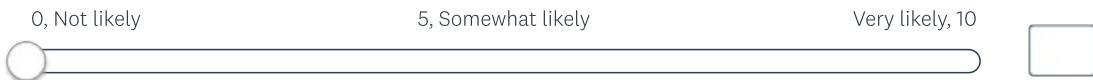
* 6. After viewing the AI's performance on previous test data, what is your trust level in this AI?

-5, Totally distrust the AI

0, Neutral, neither distrust nor trust

Totally trust the AI, 5

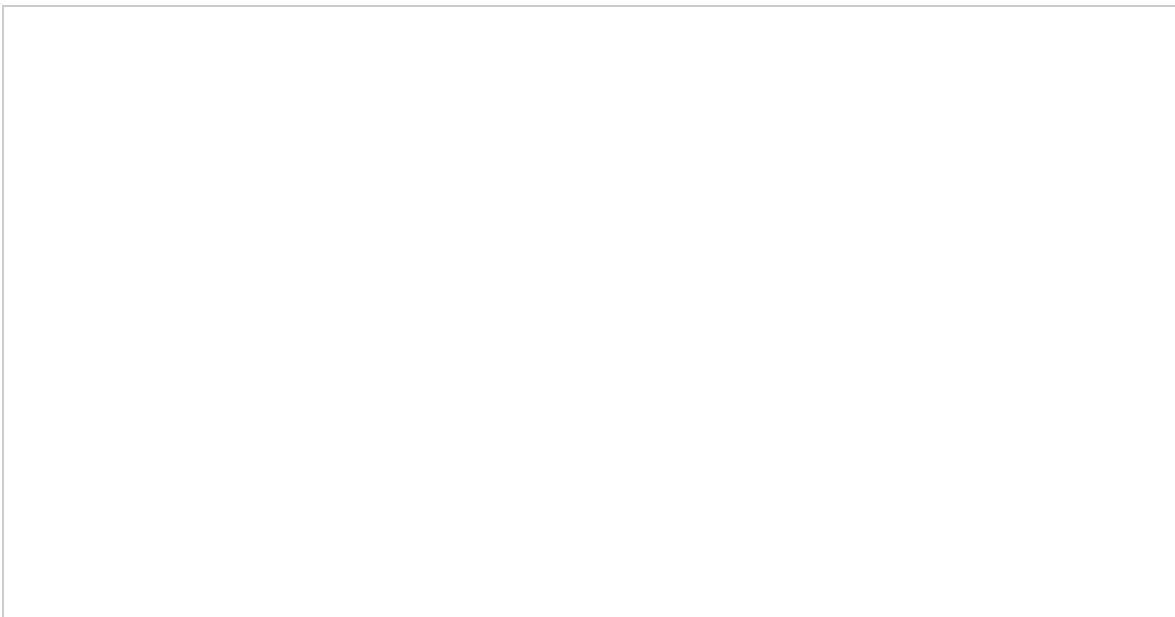
* 7. After viewing the AI's performance on previous test data, how likely will you incorporate this AI's suggestions into your routine clinical practices, such as diagnosis, prognosis, and medical management?



Next, you will use this AI to assist you on tumor grading for 25 new patients' MRIs.

Each 3D MR image is presented as a video. You can click the triangle button to play the video and read the MRI.

* 8.



What grade of glioma would you predict this MRI to be?

Grade 2 or Grade 3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 9. Your prediction is {{ Q8 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

10. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

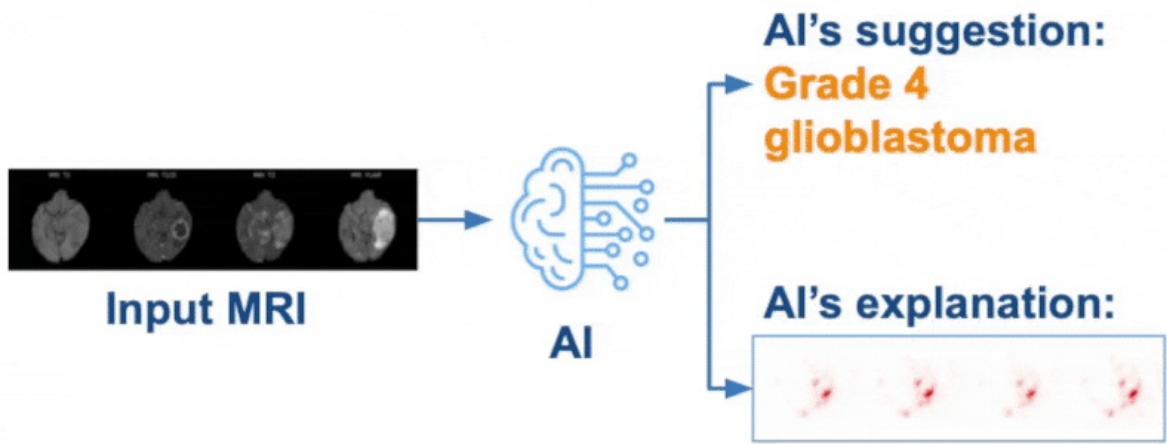
Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

**To assist doctors to make informed decisions,
the AI needs to have the ability to explain its
decisions,
mimicking how your colleagues explain**



* 11. Please click the triangle "play" button to play the video and read the color map explanation.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

12. How closely does the highlighted area of the color map match with your clinical judgment?

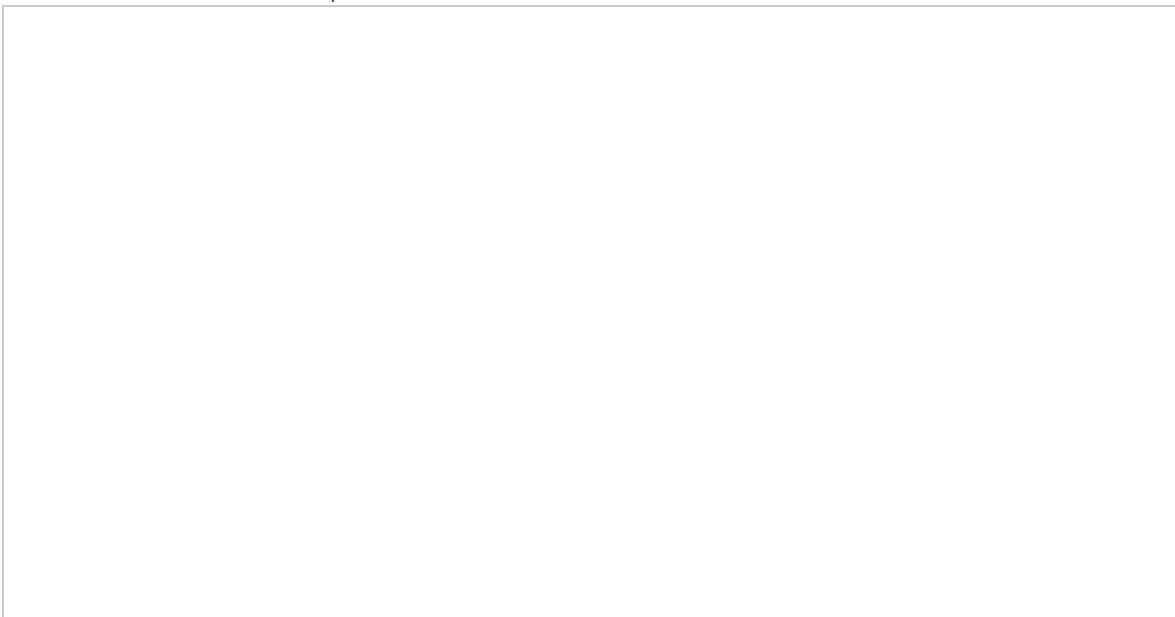
0, Not close at all

5, Somewhat close

Very close, 10

Brain AI Survey

* 13. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 14. Your prediction is {{ Q13 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

15. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 16.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

17. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 18. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 19. Your prediction is {{ Q18 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

20. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 21.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

22. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 23. This is another new patient MRI.



What grade of glioma would you predict it to be?

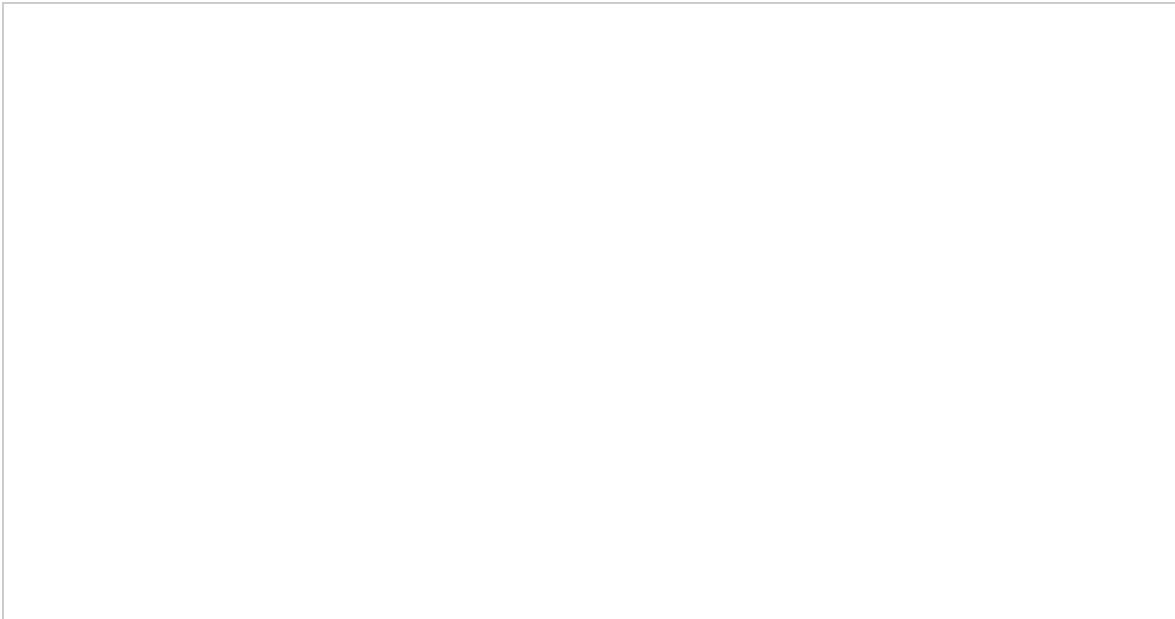
Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 24. Your prediction is {{ Q23 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

25. There is an “**Explain to me**” button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 26.

After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

27. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 28. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 29. Your prediction is {{ Q28 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

30. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 31.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

32. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 33. This is another new patient MRI.



What grade of glioma would you predict it to be?

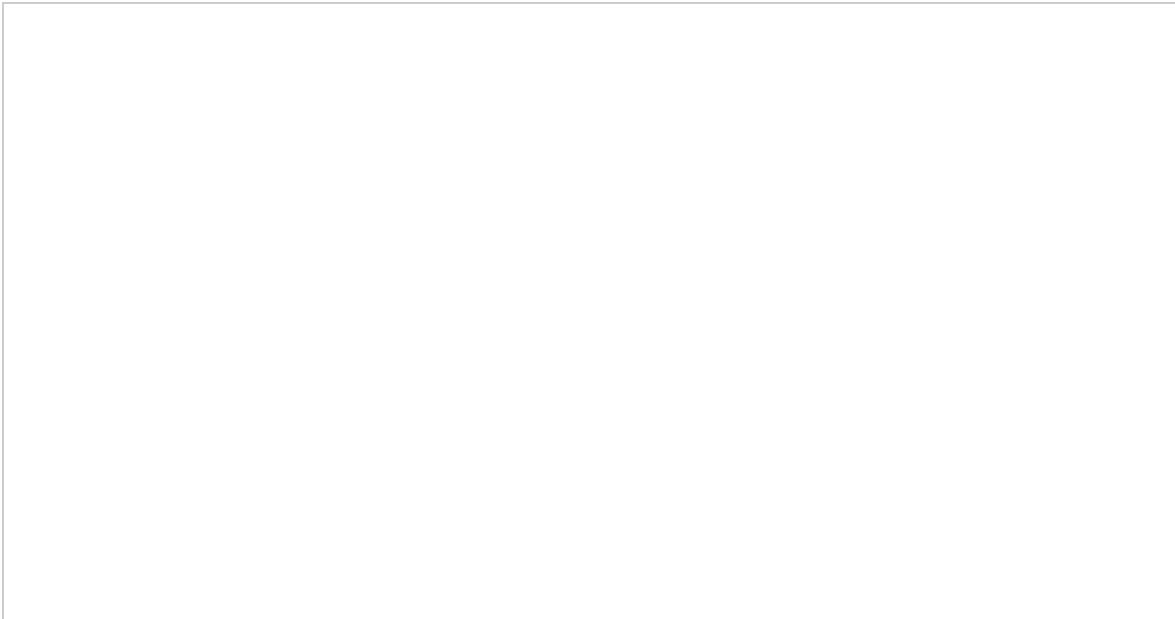
Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 34. Your prediction is {{ Q33 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

35. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 36.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

37. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 38. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 39. Your prediction is {{ Q38 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

40. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 41.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

42. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 43. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 44. Your prediction is {{ Q43 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

45. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 46.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

47. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 48. This is another new patient MRI.



What grade of glioma would you predict it to be?

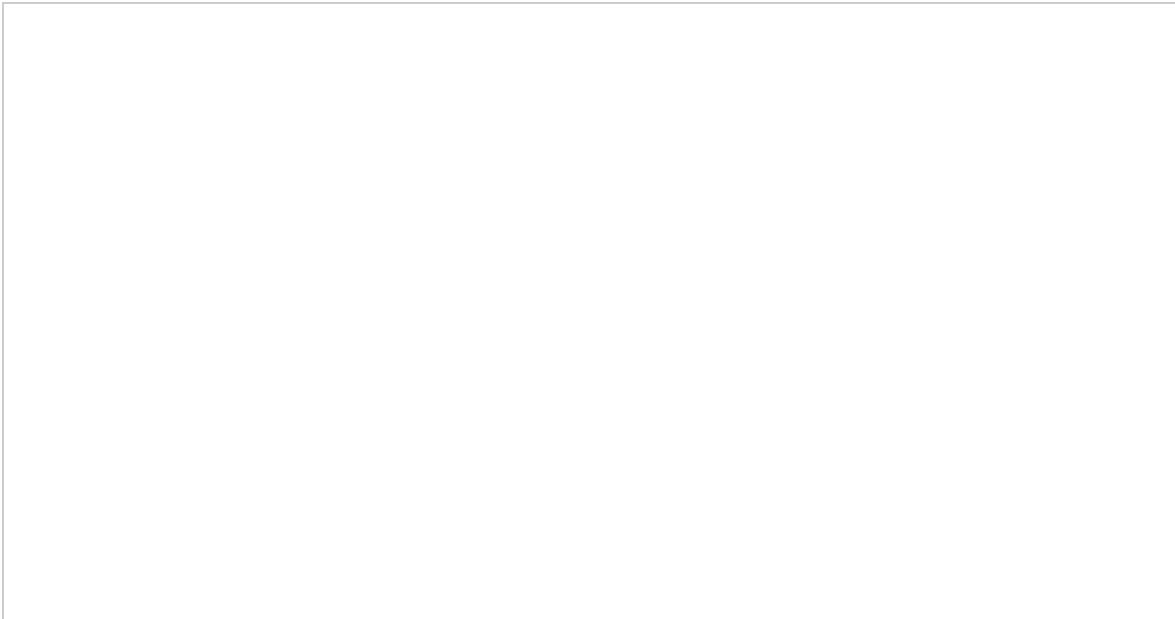
Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 49. Your prediction is {{ Q48 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

50. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 51.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

52. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 53. This is another new patient MRI.



What grade of glioma would you predict it to be?

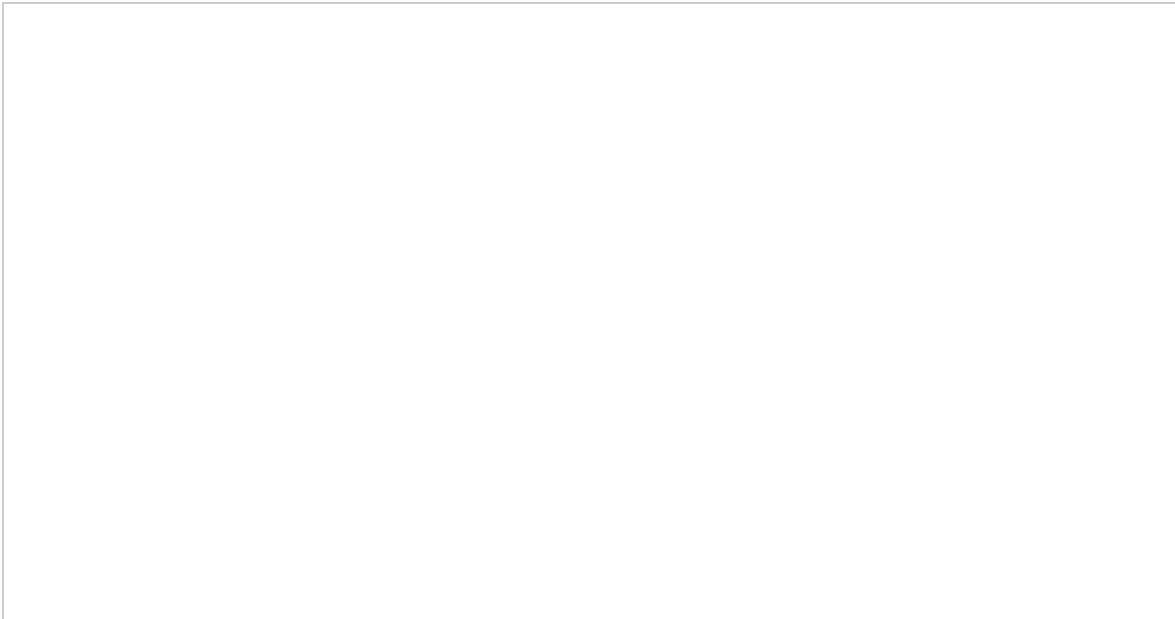
Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 54. Your prediction is {{ Q53 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

55. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 56.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

57. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 58. This is another new patient MRI.



What grade of glioma would you predict it to be?

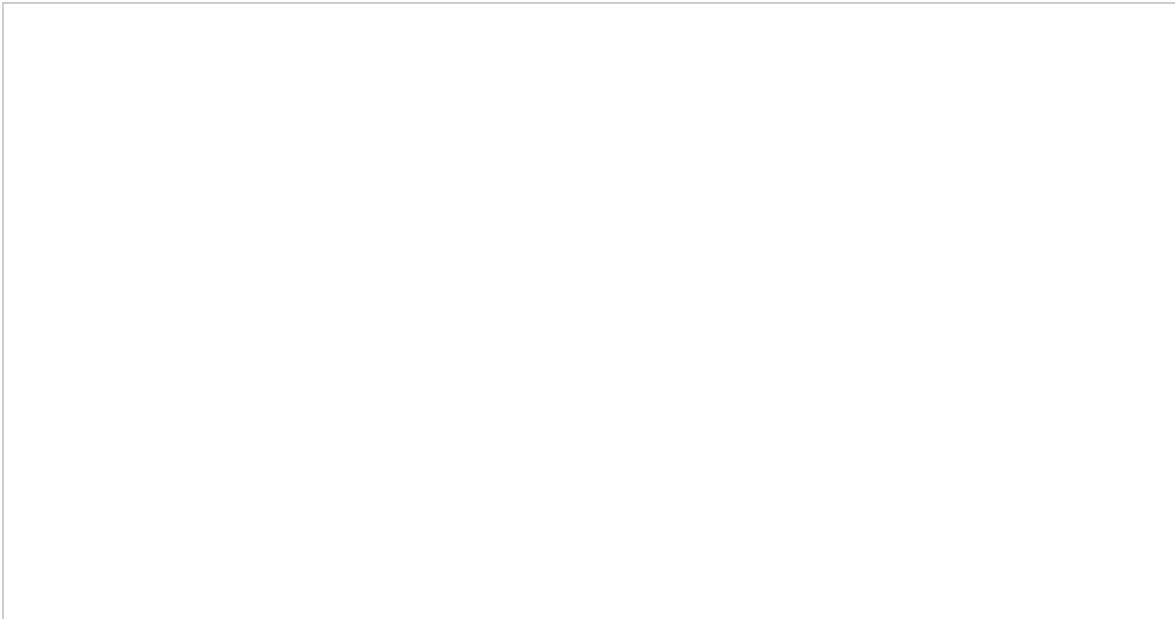
Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 59. Your prediction is {{ Q58 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

60. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 61.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

62. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 63. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 64. Your prediction is {{ Q63 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

65. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 66.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

67. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 68. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 69. Your prediction is {{ Q68 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

70. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 71.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

72. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 73. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 74. Your prediction is {{ Q73 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

75. There is an “**Explain to me**” button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 76.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

77. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 78. This is another new patient MRI.



What grade of glioma would you predict it to be?

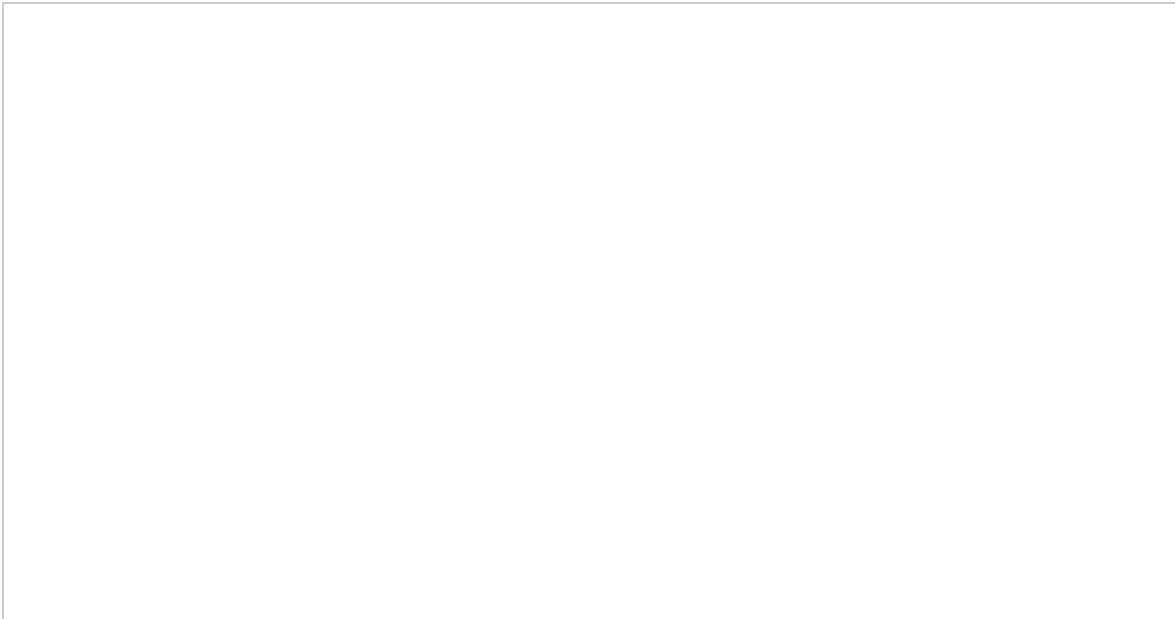
Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 79. Your prediction is {{ Q78 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

80. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 81.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

82. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 83. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 84. Your prediction is {{ Q83 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

85. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 86.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

87. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 88. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 89. Your prediction is {{ Q88 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

90. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 91.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

92. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 93. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 94. Your prediction is {{ Q93 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

95. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 96.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

97. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 98. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 99. Your prediction is {{ Q98 }}. AI's prediction is **Grade 4 glioblastoma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

100. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 4 glioblastoma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 101.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

102. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 103. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 104. Your prediction is {{ Q103 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

105. There is an “**Explain to me**” button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 106.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

107. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 108. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 109. Your prediction is {{ Q108 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

110. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 111.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

112. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 113. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 114. Your prediction is {{ Q113 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

115. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 116.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

117. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 118. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 119. Your prediction is {{ Q118 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

120. There is an “**Explain to me**” button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 121.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

122. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 123. This is another new patient MRI.



What grade of glioma would you predict it to be?

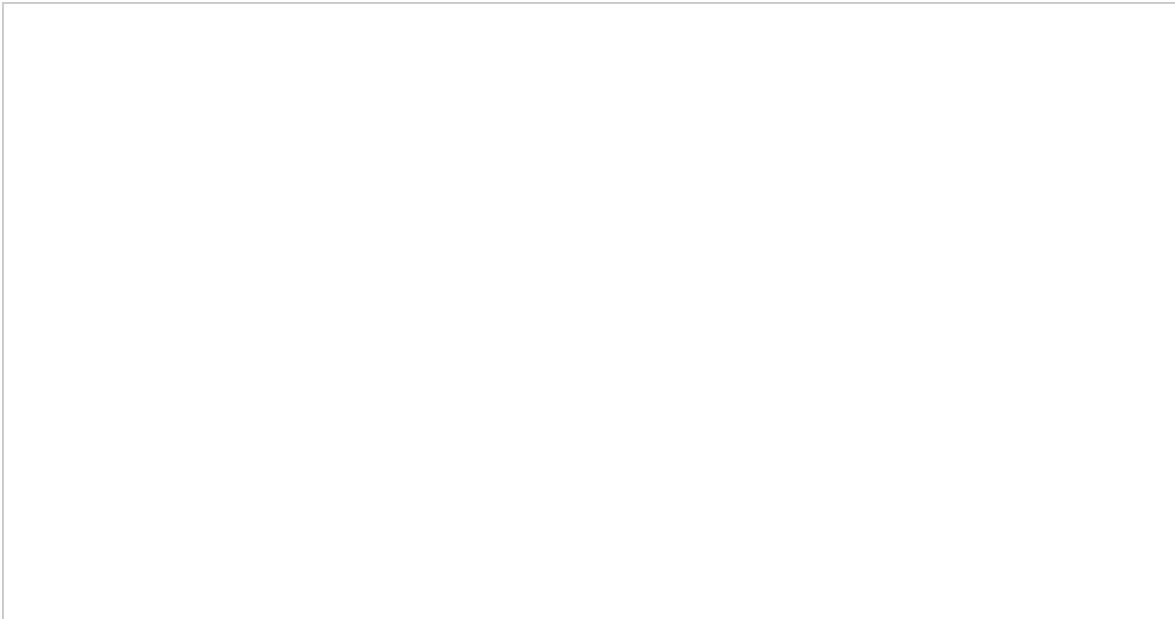
Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 124. Your prediction is {{ Q123 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?



Grade 2/3 glioma

Grade 4 glioblastoma

125. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 126.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

127. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

5, Somewhat close

Very close, 10



Brain AI Survey

* 128. This is another new patient MRI.



What grade of glioma would you predict it to be?

Grade 2/3 glioma

Grade 4 glioblastoma

Brain AI Survey

* 129. Your prediction is {{ Q128 }}. AI's prediction is **Grade 2/3 glioma**.

After viewing AI's suggestion, what is your current judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

130. There is an "**Explain to me**" button in the AI system. It will explain how the AI model makes this prediction.

Would you like to check the explanation from AI for this MRI?

Yes No

Other (please specify)

The AI could explain its decisions using color maps.

We would like to invite you to check the color map explanation from AI. It explains why AI predicts this MRI as **Grade 2/3 glioma**.

Row 1 is the original MRI you just read.

Row 2 is the color map only. **More red** indicates the region is **more important** for this AI's prediction.

Row 3 is the color map overlaid on the MRI.

* 131.



After viewing AI's explanation, what is your final judgment on the tumor grade?

Grade 2/3 glioma

Grade 4 glioblastoma

132. How closely does the highlighted area of the color map match with your clinical judgment?

0, Not close at all

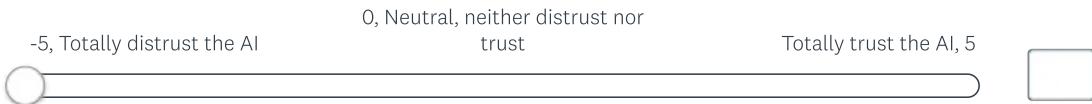
5, Somewhat close

Very close, 10

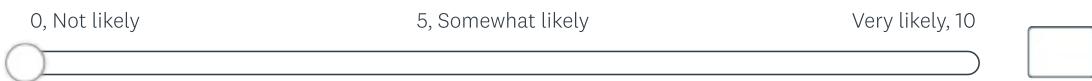


Brain AI Survey

* 133. After viewing all the AI's predictions and explanations, what is your current trust level in this AI?



* 134. After viewing all the AI's predictions and explanations, how likely will you incorporate this AI's suggestions into your routine clinical practices, such as diagnosis, prognosis, and medical management?



135. When are you most likely to check those color map explanations from AI?

- To build and calibrate my trust in this AI
- To ensure the safety use of the AI
- To meet the ethical requirements
- To meet the legal requirements
- When I doubt about the prediction from AI
- For a difficult case, when I am not certain
- To ensure fairness and no biases in the AI model
- To generate report or patient chart
- To make Differential Diagnosis
- Before discussion with my colleagues
- To learn from AI
- To make new medical discovery
- To improve my patients' outcomes
- When I am trading off among multiple objectives for my patient
- To verify AI's decisions
- Other (please specify)

Brain AI Survey

136. For your selected scenarios to check the explanation from AI, would you mind ranking them regarding your likelihood of checking the explanations?

- ☰ To build and calibrate my trust in this AI
- ☰ To ensure the safety use of the AI
- ☰ To meet the ethical requirements
- ☰ To meet the legal requirements
- ☰ When I doubt about the prediction from AI
- ☰ For a difficult case, when I am not certain
- ☰ To ensure fairness and no biases in the AI model
- ☰ To generate report or patient chart
- ☰ To make Differential Diagnosis
- ☰ Before discussion with my colleagues
- ☰ To learn from AI
- ☰ To make new medical discovery
- ☰ To improve my patients' outcomes
- ☰ When I am trading off among multiple objectives for my patient
- ☰ To verify AI's decisions
- ☰ [Insert text from Other]

137. In this AI-assisted MRI reading experience, do you have any questions or concerns on the AI predictions, AI explanations, or any needs/weaknesses/limitations in the AI system you want to comment on?

Brain AI Survey

Demographic Questionnaire

Thanks for your patience! This is the last part of the survey on Demographic Questionnaire. Thank you for reaching this far!

* 138. What is your understanding of artificial intelligence (AI)?

- I have never heard of AI before
- I only hear of AI from the news, friends, etc.
- I use AI in my work or life.
- I can program, but I can not write AI code
- I can write AI code
- Other (please specify)

Brain AI Survey

139. If you use AI in your work or life, please specify:

What kind of AI do
you use in your
work or life?

What tasks do you
use AI to
accomplish?

Brain AI Survey

* 140. What is your opinion on incorporating AI technology into your clinical decision-making scenarios? (you may select multiple choices)

- I am not interested in AI, and I do not pay attention to it
- I am concerned about the prevalence of AI (e.g.: it will take over many doctors' job; it's a threat to human beings)
- I am skeptical of the incorporation of AI technology in medical practice, but I would like to learn more about it
- I am neutral regarding the incorporation of AI technology in medical practice
- I am interested in the incorporation of AI in medical practice, and willing to know more about it
- I am excited to use AI to improve my work and life

Other (please specify)

* 141. How many years have you been practising medicine? (since the acquisition of your medical degree)

* 142. How many years have you been practicing your {{Q2}} specialty?

143. Your age

144. Your gender

- Female
- Male
- Other

145. This is almost the end of the Medical AI Survey. Do you have any additional comments about medical AI, AI's predictions and its explanations, the use of AI in clinical setting, or anything else?

Thank you very much for your time and efforts in the study. Your valuable inputs will benefit the AI and medical AI research community!

We will be happy to provide **\$50 CAD Amazon Gift Card** (or equivalent USD dollar) to thank you for your time and effort in the survey. If you would like to receive it, would you mind **emailing your name and email address**, to: weinaj@sfu.ca [click to email], to receive the gift card? Please also indicate whether you prefer a gift card from Amazon US or CA. Please feel free to contact the study PI Weina Jin (weinaj@sfu.ca) if you have any problems during this process.

We have an optional **post-survey interview** for about **15-20 minutes**. This interview is optional but provides you an opportunity to **talk about your experience using this AI** or any comments on medical AI, regarding the use of AI in clinical implementation.

Your answers to the survey, as well as your valuable inputs in the interview, will benefit the AI and medical AI research community to **build better medical AI systems** that assist doctors' work! The interview will be conducted remotely.

If you would like to participate in the interview, you can indicate in your study compensation email.

This is the end of the Brain AI Survey! Thank you again for your time and valuable inputs! Stay safe and have a nice day!