Peer Review File

Article information: https://dx.doi.org/10.21037/gs-24-98

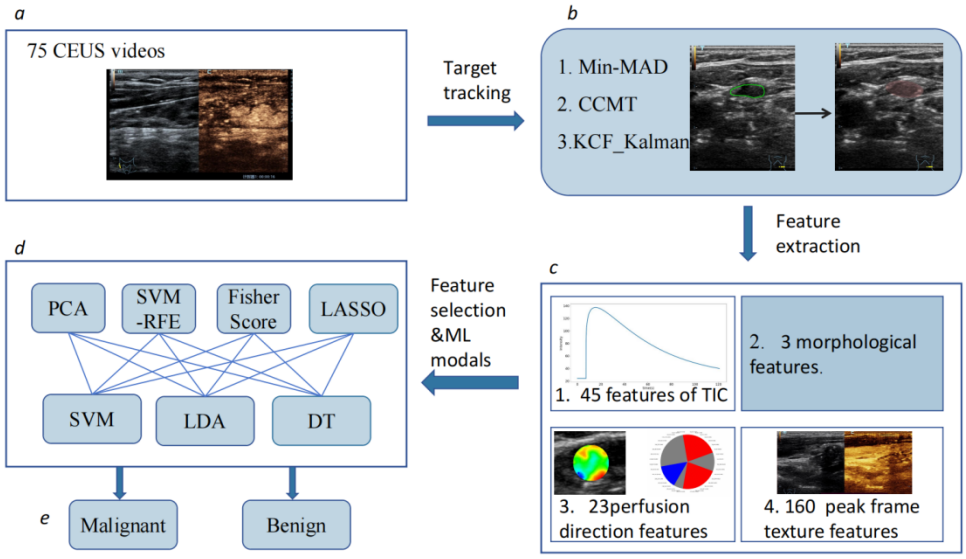
Reviewer A

Comment 1: Modification of Figure 1:

Consider updating Figure 1 to comprehensively illustrate all the experimental methods used in the study, including those for tracking and feature extraction. This should be similar to how the figure currently presents feature selection and machine learning (ML) models. This enhancement will provide a clearer overview of the methodologies employed throughout the study.

Reply 1: Thank you. We have redrawn the flowchart, and added the details.

Changes in the text: Figure 1



Comment 2: Adding a Flow Diagram:

Incorporate a flow diagram that demonstrates the output as depicted in Figure 1, focusing on target tracking and feature extraction. This new diagram should highlight the chosen feature selection algorithm and indicate the number of features selected for each ML model. This will provide a visual representation of the workflow, making it easier for readers to understand the process and the rationale behind the selection of features and models.

These additions will provide a more comprehensive understanding of the methodology and enhance the overall clarity of the paper.

Reply 1: Thank you. We have redrawn the flowchart, and added the details. Besides, we explained the flow diagram in detail in the figure notes. We hope it is enough for readers to understand the process and the the rationale behind the selection of features and models.

Changes in the text: Lymph node (LN) diagnosis radiomics workflow. a. There were 75 CUES videos included in the prospective study. b. The LN region was manually tagged, and three

different target tracking algorithms were performed. Finally, KCF_Kalman was used in this study. c. A total of 231 radiomics features with 45 TIC featurs, 3 morphological features, 23 perfusion direction features and 160 peak frame texture features were extracted. d. The four feature selection algorithms were used in combination with each of the three machine learning algorithms in turn to select the best combination. e. Among these combinations, the SVM-RFE combination SVM classifier showed the best results when 47 key radiomic features were selected.

Reviewer B

Comment 1: In line 64, replace XXX with correct information.
Reply 1: Thank you. I am sorry for the error. We have revised according to your comments.
Changes in the text: The study was approved by the Ethics Office of West China Hospital (approval number 1341)

Comment 2: Line 30, improve English.
Reply 1: Thank you. We have revised according to your comments.
Changes in the text: thyroid cancer (TC) is prone to cervical lymph node (CLN) metastasis both before and after surgery.

Comment 3: Line 5: the T is in bold.
Reply 1: Thank you. We have revised according to your comments.
Changes in the text: Thyroid cancer prone to cervical lymph node metastasis both before and after surgery.

Comment 4: Lines 95 and 96, make sure the acronym is explained previously.
Reply 1: Thank you. The acronyms of CLN and CAD has been explained in Line 31 and 61.
Changes in the text: Line 31: However, thyroid cancer (TC) is prone to cervical lymph node (CLN) metastasis both before and after surgery.
Line 61: we focused on the use of CEUS videos to develop a computer aided diagnosis (CAD) system to correctly identify benign and malignant lymph nodes in thyroid cancer patients.

Comment 5: In acknowledgement section, replace XXX with correct information.
Reply 1: Thank you. We have revised according to your comments.
Changes in the text: This study was supported by the grants from Natural Science Foundation of Sichuan Province (No.2023NSFSC1863) , Foundation of Sichuan medical and health care promotion institute (No.SCMHPI2023HT562) and Leader health research project of Sichuan province (No.2023-120).

Comment 6: Consider adding more background about AI and machine learning in general.
Reply 1: Thank you.We have revised according to your comments.
Changes in the text: Artificial intelligence (AI)-assisted diagnosis can reduce dependence on ultrasound operators. In recent years, it has become popular in ultrasonic diagnoses.[12-14] There are several studies reported that AI related ultrasonic image analysis has been applied in the field of thyroid, breast, liver, obstetrics and gynecology, and so on[15]. Some commercial AI

systems have been integrated into ultrasonic machines for real- time diagnosis[16]. However, there is no machine learning study to predict the risk of cervical lymph node metastasis from thyroid cancer based on CEUS image sequences.