Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

PEER-REVIEW REPORT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 74242

Title: Accurate and Generalizable Quantitative Scoring of Liver Steatosis from Ultrasound Images via Scalable Deep Learning

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 05140714
Position: Peer Reviewer
Academic degree: PhD
Professional title: Postdoctoral Fellow, Research Fellow, Teaching Assistant
Reviewer's Country/Territory: Italy
Author's Country/Territory: Taiwan

Manuscript submission date: 2021-12-18

Reviewer chosen by: AI Technique

Reviewer accepted review: 2021-12-20 08:16

Reviewer performed review: 2021-12-20 09:24

Review time: 1 Hour

Scientific quality	[ ] Grade A: Excellent [Y] Grade B: Very good [ ] Grade C: Good [ ] Grade D: Fair [ ] Grade E: Do not publish
Language quality	[ ] Grade A: Priority publishing [Y] Grade B: Minor language polishing [ ] Grade C: A great deal of language polishing [ ] Grade D: Rejection
Conclusion	[ ] Accept (High priority) [ ] Accept (General priority) [Y] Minor revision [ ] Major revision [ ] Rejection
Re-review	[Y] Yes [ ] No

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

Peer-reviewer statements	Peer-Review: [Y] Anonymous [ ] Onymous Conflicts-of-Interest: [ ] Yes [Y] No

SPECIFIC COMMENTS TO AUTHORS

The authors present a method based on deep learning for the quantification of hepatic steatosis in liver US images. Specifically, a resnet18 is used to classify the images into 4 classes: None, Mild, Moderate and Severe Steatosis. The paper is clear and easy to follow. My comments are listed below: 1) Additional background knowledge should be added within the introduction. I would add that the gold standard method for quantification of steatosis is liver biopsy. In the same section I would mention the several recent methods that have been published in this topic (doi: 10.1016/j.compbiomed.2020.103836, 10.1002/cyto.b.21790). However, liver biopsy is an invasive method and therefore other methods such as MRI and US are used for screening. This makes it easier for the reader to understand the problem and the framing of this work. 2) More details should be added on the network training to make the work more reproducible. How many epochs was it trained on? with what optimization algorithm? was it pre-trained? why was the ResNet18 architecture chosen?

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

PEER-REVIEW REPORT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 74242

Title: Accurate and Generalizable Quantitative Scoring of Liver Steatosis from Ultrasound Images via Scalable Deep Learning

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 06006212
Position: Peer Reviewer
Academic degree: MD

Professional title: Doctor

Reviewer's Country/Territory: Japan

Author's Country/Territory: Taiwan

Manuscript submission date: 2021-12-18

Reviewer chosen by: AI Technique

Reviewer accepted review: 2021-12-27 06:01

Reviewer performed review: 2021-12-27 11:03

Review time: 5 Hours

Scientific quality	[ ] Grade A: Excellent [Y] Grade B: Very good [ ] Grade C: Good [ ] Grade D: Fair [ ] Grade E: Do not publish
Language quality	[ ] Grade A: Priority publishing [Y] Grade B: Minor language polishing [ ] Grade C: A great deal of language polishing [ ] Grade D: Rejection
Conclusion	[ ] Accept (High priority) [Y] Accept (General priority) [ ] Minor revision [ ] Major revision [ ] Rejection
Re-review	[ ] Yes [Y] No

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

Peer-reviewer statements	Peer-Review: [Y] Anonymous [ ] Onymous Conflicts-of-Interest: [ ] Yes [Y] No

SPECIFIC COMMENTS TO AUTHORS

Thank you very much for letting me contribute to this scientific achievement. Deep Learning is a technology that has been remarkably developing these years and has been frequently used to analyze images. Since ultrasound is relatively a subjective diagnostic modality, establishing objective tools that provide universal recommendations is of great help to make our healthcare better and more accessible. In that sense, this study provided a high impact on screening choices of hepatologic conditions, such as NAFLD. Overall, this study revealed that an appropriately trained neural network algorithm potentially outperforms humans' ability in diagnosis. However, the potential problem of this study is the selection of the neural network. While the authors adopted ResNet-18 to train the algorithm, the rationale for using that network is not fully explained. In addition, since most of the readers of this journal are not experts of deep learning, the whole concept or benefit of ResNet-18 should be clarified. Moreover, as is always concerned when we discuss machine learning, it would enhance the usefulness of this article if the authors mentioned clinical implications. Machine learning models may detect NAFLD more easily and effectively, but how can we use that technique in daily practice? Is this trained model going to be published as a universal tool? Or do we have to develop a system like this on our own? This is an expected question because all machine learning models work on the premise of interpolations. That is to say, the prediction ability of each model plummets when it comes across a value outside the training set range. Many clinicians, including me, want to hear the authors' opinions and suggestions on this matter.

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

PEER-REVIEW REPORT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 74242

Title: Accurate and Generalizable Quantitative Scoring of Liver Steatosis from Ultrasound Images via Scalable Deep Learning

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 05384436
Position: Editorial Board
Academic degree: BSc, PhD

Professional title: Associate Professor

Reviewer's Country/Territory: Turkey

Author's Country/Territory: Taiwan

Manuscript submission date: 2021-12-18

Reviewer chosen by: AI Technique

Reviewer accepted review: 2021-12-31 06:53

Reviewer performed review: 2021-12-31 07:10

Review time: 1 Hour

Scientific quality	[ ] Grade A: Excellent [Y] Grade B: Very good [ ] Grade C: Good [ ] Grade D: Fair [ ] Grade E: Do not publish
Language quality	[Y] Grade A: Priority publishing [ ] Grade B: Minor language polishing [ ] Grade C: A great deal of language polishing [ ] Grade D: Rejection
Conclusion	[Y] Accept (High priority) [ ] Accept (General priority) [ ] Minor revision [ ] Major revision [ ] Rejection
Re-review	[ ] Yes [Y] No

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

Peer-reviewer statements	Peer-Review: [Y] Anonymous [ ] Onymous Conflicts-of-Interest: [ ] Yes [Y] No

SPECIFIC COMMENTS TO AUTHORS

Well written manuscript, wish you success with your academic carrier.

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

PEER-REVIEW REPORT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 74242

Title: Accurate and Generalizable Quantitative Scoring of Liver Steatosis from Ultrasound Images via Scalable Deep Learning

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 05915090
Position: Peer Reviewer
Academic degree: MD

Professional title: Doctor

Reviewer's Country/Territory: China

Author's Country/Territory: Taiwan

Manuscript submission date: 2021-12-18

Reviewer chosen by: AI Technique

Reviewer accepted review: 2021-12-29 00:28

Reviewer performed review: 2022-01-05 20:27

Review time: 7 Days and 19 Hours

Scientific quality	[ ] Grade A: Excellent [Y] Grade B: Very good [ ] Grade C: Good [ ] Grade D: Fair [ ] Grade E: Do not publish
Language quality	[ ] Grade A: Priority publishing [Y] Grade B: Minor language polishing [ ] Grade C: A great deal of language polishing [ ] Grade D: Rejection
Conclusion	[ ] Accept (High priority) [Y] Accept (General priority) [ ] Minor revision [ ] Major revision [ ] Rejection
Re-review	[ ] Yes [Y] No

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

Peer-reviewer statements	Peer-Review: [Y] Anonymous [ ] Onymous Conflicts-of-Interest: [ ] Yes [Y] No

SPECIFIC COMMENTS TO AUTHORS

This study develop a scalable deep learning (DL) algorithm for quantitative scoring of liver steatosis from 2D ultrasound images. It incorporated different 2D US scanner models and brands, different liver viewpoints, and prospectively and retrospectively collected images. Good reliability and performance across different liver viewpoints and scanners were demonstrated. The performance of the deep learning algorithm's quantitative score was comparable to or better than the control attenuation parameter produced by FibroScan. The highlight of this manuscript is the use of big data ultrasound images, which shows that the researchers have been committed to studying liver steatosis for long time and accumulated rich research data. This study covers multiple sub-studies, and it is recommended to make an experimental flow chart for the whole experimental process to facilitate readers' overall understanding of the research process and experimental design.

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

PEER-REVIEW REPORT

Name of journal: *World Journal of Gastroenterology*

Manuscript NO: 74242

Title: Accurate and Generalizable Quantitative Scoring of Liver Steatosis from Ultrasound Images via Scalable Deep Learning

Provenance and peer review: Invited Manuscript; Externally peer reviewed

Peer-review model: Single blind

Reviewer's code: 04163041
Position: Editorial Board
Academic degree: FACS, MBBS, MNAMS
Professional title: Professor
Reviewer's Country/Territory: India
Author's Country/Territory: Taiwan

Manuscript submission date: 2021-12-18

Reviewer chosen by: AI Technique

Reviewer accepted review: 2021-12-26 10:05

Reviewer performed review: 2022-01-11 08:56

Review time: 15 Days and 22 Hours

Scientific quality	[ ] Grade A: Excellent [Y] Grade B: Very good [ ] Grade C: Good [ ] Grade D: Fair [ ] Grade E: Do not publish
Language quality	[ ] Grade A: Priority publishing [Y] Grade B: Minor language polishing [ ] Grade C: A great deal of language polishing [ ] Grade D: Rejection
Conclusion	[ ] Accept (High priority) [ ] Accept (General priority) [Y] Minor revision [ ] Major revision [ ] Rejection
Re-review	[ ] Yes [Y] No

Baishideng Publishing Group

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

Peer-reviewer statements	Peer-Review: [Y] Anonymous [ ] Onymous Conflicts-of-Interest: [ ] Yes [Y] No

SPECIFIC COMMENTS TO AUTHORS

The aim of the study is to derive accurate and quantitative scoring system using 2D US based DL algorithm to assess the severity of hepatic steatosis. However the methodology used may not be appropriate to achieve this goal. 1. The study uses stored images of US to train the deep learning. These images used in the study are liable to have operator and US settings variability. No indices like Hemaguchi score, US-FLI score and hepato renal steatosis score were used to validate these semi quantitative US images. 2. There is no doubt that 2D US is the modality of choice for diagnosis of Steatosis. US though has many advantages, has its own shortcomings; poor inter observer variability; poor sensitivity and specificity in discerning mild steatosis; poor utility in obese where steatosis is common etc. These limitations necessitated the use of other US based methodologies like CAP, AC, ASQ, BSC, SWE, QUS Spectroscopy, transient elastography, etc., to quantify steatosis with comparable efficiency. CAP needs different system and even in this there is considerable overlap with grades of steatosis. Various US machines that use advanced software to quantify the steatosis by attenuation coefficient, ATI, backscatter coefficient etc., are not indicated in this study. It may be too much to expect 2D US based DL to nullify these shortcomings. 3. Patients with alternative causes of hepatic steatosis other than NAFLD are also included in this study and their images may have liver structural alteration that is caused by factors other than fat and this may influence the interpretations. 4. The non-image based noninvasive methodologies like FIB-4 Index, APRT, ELF, NAFLD Score recommended to grade the steatosis in various guidelines of NAFLD, are not used in this study to compare and validate the US based DL Algorithm's potential. 5. The aim to develop quantitative

7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-399-1568
E-mail: bpgoffice@wjgnet.com
https://www.wjgnet.com

score to assess liver steatosis with 2D US images using DL algorithm is marred by including too many view groups, viewpoints, etc., in this study, leaving one confused.