

Dear Editor and Reviewers,

We truly appreciate all your valuable comments. After a careful review, we have adopted the observations in our revised manuscript, entitled “Artificial Intelligence–Driven Mobile Platform for Thermographic Imaging to Support Maternal Health Care”. Our point-to-point responses to the reviewers’ comments are given below:

REVIEWER 1 - Round 2

Point 1. *Most comments have been properly addressed. I have several comments on the revised paper.*

Response. Thank you for your comments.

Point 2. *Abstract: Since multiple existing methods should be compared, the authors should state the percentage of improvement by the proposed method. In addition, other performance evaluation metrics should be reported (in addition to Dice).*

Response. We appreciate the reviewer’s constructive suggestion. In the revised version, we have clarified the relative performance gains achieved by our proposed U-Net with a MobileNetV3 backbone, and we have explicitly added additional evaluation metrics beyond the Dice coefficient. Specifically, we now report the Jaccard Index (IoU), Sensitivity, and Specificity in Table 6 (Section 5.1). Our proposed model achieved: Dice = 0.97, Jaccard (IoU) = 0.94, Sensitivity = 0.98, and Specificity = 0.96. Compared with the best-performing ResNet34-based baseline (Dice = 0.94), the proposed lightweight MobileNetV3-U-Net exhibits a +3.2 % absolute improvement in Dice and a +4.5 % gain in IoU, while being 73 % more parameter-efficient.

These values have been incorporated into the Abstract to quantitatively express the improvement, as follows:

...Our analysis identified a U-Net with a MobileNetV3 backbone as the optimal architecture, achieving a high Dice score of 0.97 and a 4.5 % intersection over union (IoU) gain over heavier backbones while being 73 % more parameter-efficient.

31 **Point 3.** *The authors can consider adding more terms (at most 10) in the*
32 *keywords because these help the readers to download and potentially cite the*
33 *paper.*

34 **Response.** We thank the reviewer for this valuable suggestion. In the revised
35 version, we have expanded the list of keywords to enhance discoverability and
36 ensure better indexing across biomedical imaging, artificial intelligence, and
37 mobile health domains. The revised set (now 10 terms) more comprehensively
38 represents the technical and clinical aspects of our work:

39 Keywords: Infrared thermography; maternal care monitoring; labor epidu-
40 ral analgesia; thermal imaging; semantic segmentation; lightweight deep
41 learning; MobileNetV3; non-rigid registration; B-spline free-form deforma-
42 tion; mobile health application.

43 **Point 4.** *Tables 1 and 2: The metrics being reported should align with*
44 *those in the experiment (in later sections).*

45 **Response.** Thank you for the observation. We have revised the notation in
46 Tables 1 and 2 to clearly indicate the use of the Dice and/or Jaccard (IoU)
47 metrics as the main performance measures for semantic segmentation, where
48 applicable. This clarification ensures consistency between the comparative
49 studies summarized in the related-work section and the metrics reported in
50 the subsequent experimental and results sections.

51 **Point 5.** *Table 5: Why only $t_0, t_1, t_5, t_{10}, t_{15}$, and t_{20} being reported? There*
52 *are many more variables.*

53 **Response.** We appreciate the reviewer’s insightful comment. The six re-
54 ported time points (t_0 – t_{20}) correspond to the standardized temporal ac-
55 quisition protocol, where thermographic images and physiological variables
56 were recorded every five minutes following the initial epidural administra-
57 tion. These specific intervals are consistent with prior obstetric anesthesia
58 monitoring studies and were selected to capture the most relevant phase of
59 sympathetic blockade onset and stabilization (i.e., the first 20 minutes post-
60 injection).

61 Regarding the variables, Table 5 summarizes only those directly related

to the physiological and thermal response relevant to labor epidural analgesia assessment—namely systolic and diastolic blood pressure, maternal and fetal heart rate, and pain level (VAS). Other demographic and procedural parameters (e.g., age, BMI, gestational age, drug dosage) are instead presented in Table 4 to maintain clarity and avoid redundancy. We have clarified this rationale in the table caption, as follows:

Summary of key maternal and fetal physiological variables recorded during the labor epidural analgesia procedure at standardized monitoring intervals. Measurements were obtained immediately after epidural administration (t_0) and subsequently at t_1, t_5, t_{10}, t_{15} , and t_{20} minutes post-injection, corresponding to the validated acquisition protocol illustrated in Figure 1. The variables reported include systolic and diastolic blood pressure (SBP, DBP), maternal and fetal heart rate (HR, FHR), and pain intensity (VAS), which reflect the physiological and thermal response most relevant to sympathetic blockade assessment.

Point 6. *Figures 2 to 7: Details of each component are missing. Please provide the size/setting. The caption does not provide full details.*

Response. We appreciate the reviewer’s observation. The captions and accompanying text for Figures 2–7 have been expanded to include the complete architectural specifications, such as input/output dimensions, encoder stage channel sizes, decoder block configuration, upsampling method, and activation functions. These details clarify how each architecture was implemented and ensure reproducibility.

85 **REVIEWER 3 - Round 2**

86 **Point 7.** *Thanks for the invitation to review this work. The authors have*
87 *solved the previous concerns. The article is recommended for publication.*

88 **Response.** Thank you.

Bibliography

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