Form 5

Dissertation Evaluation Report

Report No.	Diploma Number: D-BIO 1296	Applicant's Name	PHAM HOANG NGOC HOA

Evaluators	Print name	Signature or Seal
Chief Evaluator:	Isao Shimokawa	/
Evaluator:	Hiroaki Ikeda	/
Evaluator:	Hiroshi Mukae	/

Evaluation Report of Dissertation

1 . Evaluation of the research purpose.

The purpose of the study is to develop a deep-learning system for the detection of lung cancer metastasis in lymph nodes on histopathologic slides. The study deserves recognition.

2 . Evaluation of the research methods.

A total of 349 lymph node slides from 101 lung cancer patients were used for development of the deep-learning detection system. The study tried to reduce the false-positive rate by using a two-step deep leaning approach, which eliminated frequently-misclassified noncancerous regions in tissue specimens. The study was well-designed and properly conducted.

3 . Evaluation of the analysis, interpretation and discussion.

Using the two-step approach, the study refined the deep-learning system to achieve 100% of sensitivity to detect macro- and micro-metastases, and isolated cancer cells in slides. The study also analyzed the remaining false-positive small areas with setting size-thresholds and indicated sufficiently high specificity of the system. The outcomes of the present study were well analyzed and interpreted. Those were also properly discussed in comparison with the findings reported in an international project of the breast cancer metastasis.

As stated above, the dissertation will greatly contribute to the AI-assisted diagnostic pathology, and the evaluators uniformly agree that the dissertation is worthy of being approved for a Doctor of Philosophy in Medical Science.

Note: Do not fill in Diploma Number.