



Hanoi,11../7...../2026

MINUTES OF MASTER THESIS DEFENSE

The master thesis defense session of student: ..Nguyễn Trung Hiếu.....
(date of birth: ..31../12../1994..) was conducted at ..8:00.. (hour/minute), on ..11../7../2026..
at VNU - International School.

Thesis title:
.....Deep learning based Detection of student
.....behavior in Classroom Environments.....

Major:ICE.....

Code:848.0111.01 QTP.....

Members of the Master thesis examination committee are present: ..3../3

No	Full name	University/ Organizations	Role in Committee	Note
1	TS. Nguyễn Quang Thuận	VNU - IS	Chair	
2	PGS.TS. Đào Quý Thỉnh	HUST	Opponent	
4	B. Phạm Thị Việt Hồng	VNU - IS	Secretary	

PART I: INTRODUCTION

1. Representatives of VNU - International School made welcoming remarks including:

- Introduction of the master thesis defense and participants;
- Announcement about Decision of the President of Vietnam National University, Hanoi on establishing the Master thesis examination committee (Decision No. ..2848../QĐ-ĐHQGHN issued on ..24../06../2026..).

PART II: THESIS DEFENSE SESSION

1. ..TS. Nguyễn Quang Thuận... - The Chair led the Master thesis examination committee.

2. TS. Phạm Thị Việt Hương – The Secretary of the Committee announced the scientific background and conditions for master thesis defense of the candidate (candidate's scientific background file and academic results are attached).

3. The candidate Nguyễn Trung Hiếu made a presentation on the thesis.

4. PGS.TS. Đào Quý Thịnh – Opponent commented on the thesis (with attached documents).

5. Questioning period from members of the Committee:

1. Are the six behavior classes defined by the SCB dataset, or were they selected based on educational requirements
2. Why did you evaluate SASE and Dynamic Task separately instead of integrating both modules into a single YOLO v12 model

6. Candidate's answers

1. Defined by the dataset
2. Self-adaption

7. The Secretary of the Committee commented on the thesis conducting progress of the candidate (with attached document).

8. Committee's Deliberations:

- Election of Vote counting committee:

1. Chair: Phạm Thị Việt Hương

2. Member: Đào Quý Thịnh

- The examination committee voted by secret ballot.

- The vote counting committee:

+ The Chair reported the vote counting result (with attached vote counting record).

- The Examination committee deliberated and came to a conclusion on the thesis examination by reaching a consensus on the assessment resolution on the thesis. The resolution concluded:

PART III: OUTCOME OF THE EXAMINATION PROCESS

1. The Chair of the Vote Counting committee announced the result of the ballot on the thesis examination.
2. The Chair of the Examination Committee announced the resolution on the thesis examination.
3. The Chair of the Examination Committee made statements and gave controls to the organizer.

The thesis defense session ended at ..8....45. (hour/minute), on 11..7..2026.

Hội đồng đánh giá đề án nhất trí thông qua đề án của học viên ...Nguyễn Trung thu... đạt yêu cầu với kết quả (thang điểm ...): ...8,8 điểm (Bằng chữ: ...eight point eight...). Học viên cần chỉnh sửa một số nội dung theo yêu cầu Hội đồng và nộp đề án hoàn thiện cho Trung tâm Thông tin - Thư viện, Đại học Quốc gia Hà Nội theo quy định.

**SECRETARY OF THE THESIS
EXAMINATION COMMITTEE**

**CHAIR OF THE THESIS
EXAMINATION COMMITTEE**

Wsp
Phạm Thị Việt Hương

Nguyễn Quang Thuận

Certification by VNU - International School

P.P. RECTOR

OFFICE OF ACADEMIC AFFAIRS



Hanoi, ... 11/7/2026

**RESOLUTION OF THE MASTER THESIS
EXAMINATION COMMITTEE**

Pursuant to the Decision No. 2848.../QĐ-DHQGHN issued on 24/6/2026. by President of Vietnam National University, Hanoi on establishing the Master thesis examination committee to examine the master thesis of the student Nguyễn Trung Hiếu (date of birth: 31/12/1999.)

Thesis title:
..... Deep learning based detection of Student Behavior
..... in Classroom Environments

Major: ICF

Code: 848.0111.016TD

The thesis examination committee conducted a meeting at 8:00 (hour/minute). on 11/7/2026 at VNU - International School.

After the candidate's presentation on the thesis, opponents' review, committee members' comments, candidate's answers, the committee deliberated and came to a conclusion:

1. The necessity, scientific significance and practicality of the thesis topic

- Necessity: Automated systems eliminate human bias, subjectivity, and the heavy time investment required for manual classroom monitoring.
- Significance: Applying cutting-edge YOLOv2 and testing custom, SASE and adaptive architectural modifications for human actions.



Hanoi, 11 / 7 / 2026

**RESOLUTION OF THE MASTER THESIS
EXAMINATION COMMITTEE**

Pursuant to the Decision No. 2848...../QĐ-DH-QGHN issued on 24 / 6 / 2026. by President of Vietnam National University, Hanoi on establishing the Master thesis examination committee to examine the master thesis of the student Nguyễn Trung Hiếu..... (date of birth: 31 / 12 / 1999.)

Thesis title:

Deep learning based detection of Student Behavior
in Classroom Environments

Major: ICF

Code: 848.0111.01.01P

The thesis examination committee conducted a meeting at 8:00 (hour/minute). on 11 / 7 / 2026 at VNU - International School.

After the candidate's presentation on the thesis, opponents' review, committee members' comments, candidate's answers, the committee deliberated and came to a conclusion:

1. The necessity, scientific significance and practicality of the thesis topic

- Necessity: Automated systems eliminate human bias, subjectivity, and the heavy time investment required for manual classroom monitoring.
- Significance: Applying cutting-edge YOLOv2 and testing custom, SASE and adaptive architectural modifications for human actions.

2. Structure, research methodology, references, etc., of the thesis

- Structure: 5 chapter → suitable
- Methodology: Quantitative experiment using the public SCB dataset preprocessed and split (70/15/15)
- References: ~20 references, modern academic sources

3. Research outcomes:

SASE performance and PyT performance are compared with Baseline Efficiency

4. Limitations and requests for thesis correction (if any):

- Clearly state the research novelty
- check again the typo and part of the thesis
- others: follow the examiner's comments

Thesis marked: ..8.8.../...10..

Outcome of master thesis defense of candidate

Qualified: ☒

Unqualified: ☐

(The thesis is qualified if the average score marked by the Committee is 5.5 or higher).

This resolution is passed by ..03../..03. members of the Committee.

**SECRETARY OF THE THESIS
EXAMINATION COMMITTEE**



Phạm Thị Việt Hương

**CHAIR OF THE THESIS
EXAMINATION COMMITTEE**



Nguyễn Quang Thuận

**Certification by VNU - International School
P.P. RECTOR
OFFICE OF ACADEMIC AFFAIRS**



Hanoi, 11/7 /2026

MINUTES OF VOTE COUNTING COMMITTEE OF THE MASTER THESIS EXAMINATION COMMITTEE

Pursuant to the Decision No. 2848./QĐ-DH-QGHN issued on 24./06./2026 by President of Vietnam National University, Hanoi on establishing the Master thesis examination committee, the committee conducted a meeting at at 8:00 (hour/minute), on 11./7./2026, at VNU - International School to examine the master thesis of the candidate ... Nguyễn Trung Hiền

Thesis title:

Deep learning based Detection of Student Behavior
in Classroom Environments

Major: ... ICE

Code: ... 848.0111.01 QTD

The vote counting committee was voted:

1. Chair: ... Phạm Thị Việt Hương

2. Member: ... Đào Quý Thịnh

The number of members presenting is 03/03, the members who are opponents are 01/03

Number of votes distributed to members: .. 03 ..

Number of unused remaining votes: 0 ...

Number of valid votes: 03

Number of invalid votes: 0

Number of votes for the score 8.8 is: 2

Number of votes for the score 8.7 is: 1

Number of votes for the score is:

Average score: ...8.8.../...10...

(In text:eight...point...eight.....)

Note: The thesis score is the average of scores marked by the examination committee's members presenting in the thesis defenses session, taken to one decimal place and not rounded.

**MEMBER OF THE VOTE
COUNTING COMMITTEE**

(sign with full name)



Đào Quý Thịnh

**CHAIR OF THE VOTE
COUNTING COMMITTEE**

(sign with full name)



Phạm Thị Việt Hương

Certification by VNU - International School

P.P. RECTOR

OFFICE OF ACADEMIC AFFAIRS

EXAMINER' REPORT ON GRADUATION THESIS

Candidate: NGUYEN TRUNG HIEU

Thesis title: Deep Learning-Based Detection of Student Behavior in Classroom Environments

Major: Informatics and Computer Engineering

Code: 8480111.01QTD

Examiner: Associate Professor Dao Quy Thinh

Place of work: Hanoi University of Science and Technology

I. COMMENT:

1. The necessity, scientific significance and practicality of the thesis:

The thesis addresses a timely and practically important research topic in the field of computer vision and intelligent education by developing a deep learning-based system for automatic student behavior detection in classroom environments. Automatic recognition of classroom behaviors has attracted considerable attention because it can assist teachers in monitoring student engagement, improving teaching quality, and supporting intelligent educational systems. Scientifically, the study investigates recent object detection models from the YOLO family and explores lightweight architectural improvements based on SASE and Dynamic Tanh to enhance detection performance. The proposed research therefore has both scientific significance and practical application potential for smart classroom environments.

2. Reliability and relevance of the thesis (*which clearly states the non-duplication of the thesis, the relevance of thesis title to thesis content – of content to training major; reliability and modernity of research methodology, etc.*)

The thesis topic is appropriate for the Master's program in Informatics and Computer Engineering. The research follows a conventional deep learning workflow including literature review, dataset preparation, model implementation, experimental evaluation, and comparative analysis. The SCB dataset and standard evaluation metrics such as Precision, Recall, mAP and FPS are appropriate for validating the proposed approach. Nevertheless, the novelty of the research should be more clearly demonstrated because both SASE and Dynamic Tanh have been proposed in previous studies, while the methodological contribution of integrating these techniques into YOLOv12 has not been sufficiently justified. In addition, the proposed improvements should be compared with other recent object detection methods to better demonstrate their effectiveness.

3. Strong points and weak points of the thesis's content, structure, and format

Strong points:

- The thesis develops a deep learning-based system capable of automatically detecting **six common student behaviors**, including reading, writing, hand-raising, discussing, turning the head, and bowing the head.
- The study systematically compares several recent YOLO models (YOLOv8, YOLOv11, and YOLOv12) and evaluates their performance on the SCB dataset.
- The proposed improvements based on **SASE** and **Dynamic Tanh (DyT)** are implemented and experimentally validated using standard object detection metrics.

- The thesis demonstrates the potential application of the proposed system for intelligent classroom monitoring and smart education.
- The thesis is generally organized in a logical sequence and includes figures that help explain the system architecture, data annotation, training results, and software demonstration.

Weak points:

- The research novelty is not sufficiently highlighted. The proposed approach mainly integrates existing SASE and Dynamic Tanh modules into YOLOv12 without clearly identifying the original scientific contribution of the thesis.
- Section 1.5 – Scope of the study (pp. 8–9): The scope states that the system classifies only three behaviors (*read, writing, and raising-hand*), whereas the methodology (Section 1.4), experimental results (Chapter 4), and conclusion consistently evaluate six behavior classes (*read, write, hand-raising, discuss, turn head, and bow head*). This inconsistency should be corrected throughout the thesis.
- Chapter 3 – Proposed Research Methodology (pp. 22–24): The methodology is mainly described as a sequence of implementation steps. The proposed framework would be clearer if the complete workflow, including data preprocessing, model modification, training, evaluation, and comparison, were summarized in a flowchart or pipeline instead of textual descriptions only.
- Chapter 5 – Summary of Research Contributions (pp. 34–36): The thesis claims contributions based on integrating SASE and Dynamic Tanh, both of which are existing techniques. The original methodological contribution of the thesis beyond applying these published methods to YOLOv12 is not clearly articulated.
- Throughout the manuscript: The thesis still contains numerous grammatical mistakes, awkward expressions, and formatting inconsistencies. For example, expressions such as "*The approaches with be combine...*" (Section 3.1, p. 22), "*Runing on baseline model*" (Section 4.1, p. 25), and several inconsistencies in capitalization (e.g., *Yolov12, YOLOv12, Yolo12s*) should be carefully revised before the final submission.

II. QUESTION (Optional)

1. Why did you evaluate SASE and Dynamic Tanh separately instead of integrating both modules into a single YOLOv12 model?
2. Nowadays, students may read from books, notebooks, laptops, tablets, or smartphones. Are all these scenarios represented in the SCB dataset? If not, how would your proposed model perform when deployed in real classrooms with these unseen situations?
3. Are the six behavior classes defined by the SCB dataset, or were they selected based on educational requirements? If they are dataset-dependent, how would this affect the applicability of the proposed system in other classroom environments?

III. CONCLUSION (*which clearly confirms the extent of satisfying requirements for a master thesis; whether the thesis can be submitted to the master thesis examination committee*)

The thesis addresses a relevant research topic and demonstrates the application of recent deep learning techniques to student behavior detection in classroom environments. The experimental work is generally well organized, and the obtained results indicate that the proposed improvements can enhance the performance of the baseline YOLOv12 model.

Nevertheless, the thesis should further clarify its methodological novelty, strengthen the technical analysis of the experimental results, improve the presentation of the research methodology, and carefully revise the language and formatting before final submission.

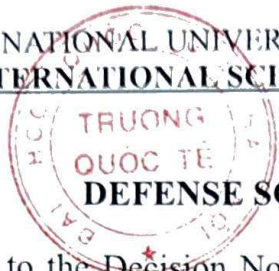
Overall, the thesis satisfies the general requirements of a Master's thesis in Informatics and Computer Engineering. I recommend that the thesis be accepted for defense after addressing the above comments.

Hanoi, July 10th, 2026

EXAMINER

A handwritten signature in blue ink, appearing to read 'Dao Quy Thinh', with a long horizontal flourish extending to the right.

DAO QUY THINH



DEFENSE SCORE SHEET FOR MASTER THESIS

Pursuant to the Decision No. 2848.../QĐ-DHQGHN issued on 24/06.. /2026. by President of Vietnam National University, Hanoi on establishing the Master thesis examination committee, the committee conducted a meeting at (hour/minute), on 11/07 /2026.. at VNU - International School to examine the master thesis of the candidate Nguyễn Trung Hiếu.

Thesis title:

Deep learning - Based Detection of Student Behavior in Classroom Environments

Major: ICE

Code:

Comments:

- The structure is logical
- Font is not unique
- It is better if the author tries a new layout, not only scp.

Result: (The mark of each committee member is on-point scale, possibly odd to one decimal place):

- In number: 8.8 marks
- In text: eight point eight marks

Hanoi, 11/7, 2026

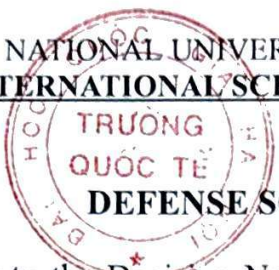
Marker

Lê Văn

Nguyễn Văn Thanh

VIETNAM NATIONAL UNIVERSITY, HANOI
INTERNATIONAL SCHOOL

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness



DEFENSE SCORE SHEET FOR MASTER THESIS

Pursuant to the Decision No. 2848.../QĐ-ĐHQGHN issued on 29..06.../2026 by President of Vietnam National University, Hanoi on establishing the Master thesis examination committee, the committee conducted a meeting at (hour/minute), on 11..07.../2026 at VNU - International School to examine the master thesis of the candidate

Nguyễn Trung Hiếu

Thesis title:

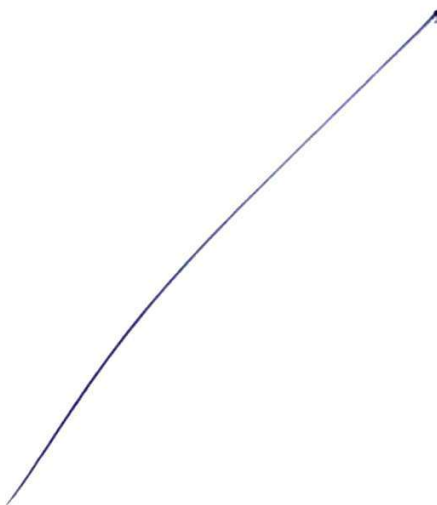
Deep Learning - Based Detection of Student Behavior in Classroom Environments.

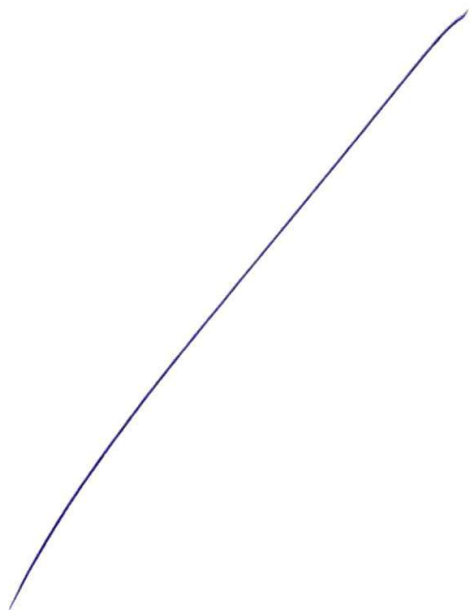
Major:

Code: 848 0111.01 RTP

Comments:

- Clearly state the contribution and research gap
- Check again typo and grammar.





Result: (The mark of each committee member is on-point scale, possibly odd to one decimal place):

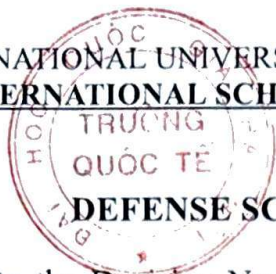
- In number:8.7..... marks
- In text: ...eight point...seven marks

Hanoi,11/7...../2026.
Marker

Phạm Thị Việt Hương

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DEFENSE SCORE SHEET FOR MASTER THESIS

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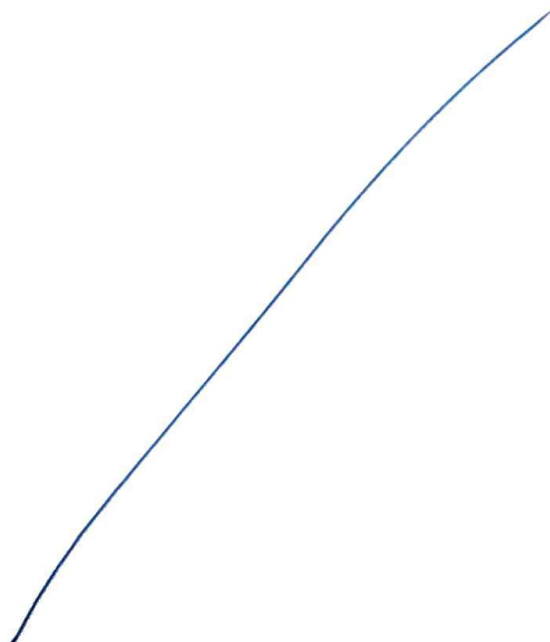
Thesis title:

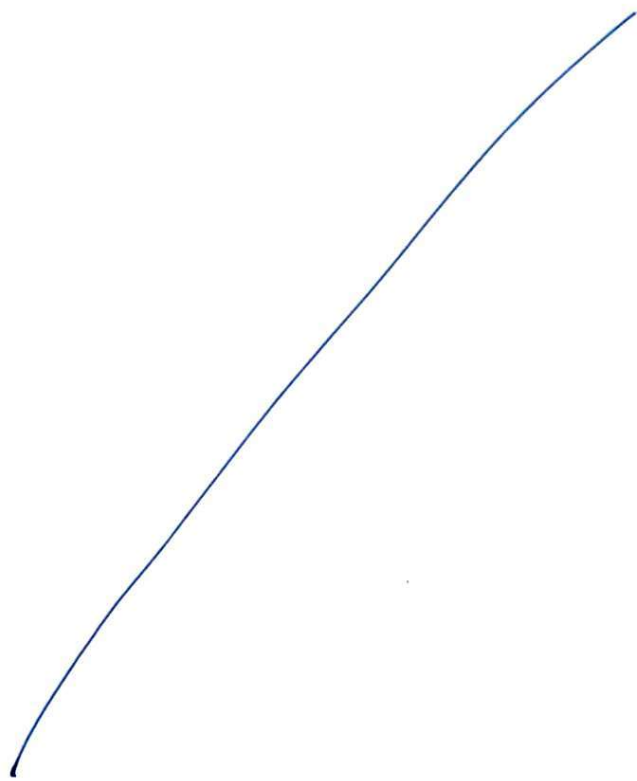
Deep learning - based Detection of student Behavior in Classroom Environments

Major: ICE

Code:

Comments:





Result: (The mark of each committee member is on-point scale, possibly odd to one decimal place):

- In number:8.8..... marks
- In text: ..Eight...point...eight marks

Hanoi, ...July 11th....., 2026.

Marker


Đào Quy Thinh