THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Epidemiological modeling and control**
Author's name:	**Harun Zalihic**
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Control Engineering
Thesis reviewer:	Ing. Tomáš Báča, Ph.D.
Reviewer's department:	Department of Cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment

ordinarily challenging

How demanding was the assigned project?

In my opinion, this work's assignment is average, mainly thanks to no need for real-world control integration and implementation.

Fulfilment of assignment

unfulfilled

How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.

All except the last point of the assignment seem to be fulfilled. The last point was supposed to focus on testing the designed controls' applicability on incomplete data. The respective chapter 6 in the thesis only contains 7 sentences of text with figures that convey almost no information. The figures lack detailed captions and any axis labels. Moreover, the figures contain color-coded overlapping curves that can not be interpreted without a legend. Therefore, I find this chapter unsatisfactory. Moreover, I would expect the testing methodology for incomplete data to be described in more detail since this is one of the two assignment subtasks that were supposed to be the student's own work.

Methodology

partially applicable

Comment on the correctness of the approach and/or the solution methods.

The chosen methodology for testing the stability of the controlled models seems to be feasible. However, similarly to my objections to the fulfillment of the last point, I have concerns about the chosen methodology in that case.

Technical level

F - failed.

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

The main output of the thesis and the bulk of the author's own work are the plots of the models' variables. However, all of the 28 figures are missing axis labels, making them almost impossible to interpret. Moreover, the figures in Chapter 6 are missing legends as well. Furthermore, some figures are missing captions for subfigures (e.g., figure 5.4, 5.5., 5.6), making them even harder to interpret. I consider those mentioned above as a significant drawback in technical writing, which should not be present (in such large numbers) in a master's final work. Moreover, the mathematical typography of this work could benefit from better distinguishing scalars, vectors, and matrices, e.g., by using bold style and by aligning multi-line equations.

Formal and language level, scope of thesis

E - sufficient.

Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?

The thesis is written using clear and understandable English, without too many typos or grammatical errors. The text itself can be followed easily.

I have concerns about the scope of the work. The work is written using quite large margins, and the majority of the figures are very wasteful with the surrounding space. For example, figures on pages 30 to 33 could easily fit on a single page. Moreover, pages such as 15, 20, 26, 37, and 40 are half-empty, mainly due to overly large figures and poor proportion of text to figures. This suggests that some figures might have been included in appendices or might need to be re-scaled to fit the text correctly. After adjusting the margins and the figures to fit the text better, I fear that the content could fail to meet the minimal 40-page limit.

Selection of sources, citation correctness	F - failed.

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

The list of bibliographic references is insufficient for a Master's diploma thesis. The student failed to conduct an independent search for adequate up-to-date sources. From the total of 20 references, the supervisor in the assignment suggested 3, 7 are poorly-cited Wikipedia pages (with malformed addresses and without the page access date), 2 are more than 100 years old, and the last 5 seem to be incomplete citations with unclear source.

Judging from just the visual side of the list of references and the lack of citation style, the author did not pay much attention to this important aspect of technical and scientific work.

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

Page 8: The nSIR model is introduced at the bottom of the page by a set of equations out of a paragraph. Did the author forget to add a description?

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

After careful evaluation, due to the numerous concerns regarding the submitted text and the fulfillment of the last task, I suggest awarding the thesis with the mark F - failed. .

In my opinion, this work is on the borderline. I think the student have a chance to defend it in front of the committee. For the defense, I have the following questions:

1. *How was the inaccurate detection of infected modeled in Chapter 6?*
2. *What is the time step for the discretized model in 3.4? How did you choose it?*

Date: **2.6.2022**   Signature: