THESIS REVIEWER'S REPORT

1 IDENTIFICATION DATA

Thesis title:	**Dynamic Control of Collaborative Robot KUKA LBR iiwa - Demonstrator System**
Author's name:	**Maroš Mešter**
Type of thesis:	bachelor
Faculty/Institute:	Faculty of Electrical Engineering
Department:	Department of Control Engineering

Thesis reviewer:	Ing. Vladimir Petrik, Ph.D.
Reviewer's department:	IMPACT, CIIRC, CVUT

2 EVALUATION OF INDIVIDUAL CRITERIA

Assignment   **challenging**

The goal of the thesis was to control the KUKA LBR IIWA robot dynamically and to design a suitable hardware setup. The combination of hardware design and robot control makes the assignment challenging.

Fulfilment of assignment   **fulfilled with minor objections**

All main goals of the thesis were fulfilled. However, no feedback control was evaluated in the thesis - the assignment states that both the feedforward and feedback control should be investigated.

Methodology   **correct**

The methodology is correct. The possible solutions how to control the robot were studied and two of them were selected for the demonstrator. Three tasks were defined for the demonstrator. The first task was completed successfully; the second task was evaluated but did not work as expected, the extension of the formulation was proposed but was not evaluated; the hardware for the third task was prepared but the control part was not finished.

Technical level   **A - excellent**

From the technical point of view, the thesis is well prepared. The safety mechanism was setuped for the robot and the open-loop control was evaluated.

Formal and language level, scope of thesis   **B - very good**

- The thesis is well-organized and the language is clear.

- There are a few minor typos ("sends the the desired", "opne-control").

- The ReadMe of the supplementary contains only the text: "read me file". It should contain a description of the supplementary.

- In Sec. 4.4, it is said that moving on straight line is without any open-loop control. Sending commands to move robot on a straight line is an open-loop control. "Without control shaping" would be better term here.

- Before I read the conclusion, the meaning of the Sec. 5.5 was not clear to me. It would be beneficial to emphasize directly in the section that the extension is outside the scope of the thesis.

Selection of sources, citation correctness   **A - excellent**

Citations are correct and the sources are relevant.

3 OVERALL EVALUATION

Questions:

- Inverse kinematics is used in the Chapter 5 to compute the path in joint angles. How was it assured that the path in joint space is continuous? Was there any mechanism that selects the suitable solution of the inverse kinematics?

- In Fig. 5.6, there are some outlier measurements (orange) that do not follow the sinusoidal shape. What caused them?

Overall, the thesis is well written and a lot of work was done. What is missing is the feedback control for which the hardware was prepared, however, control software was not finished.

The grade that I award for the thesis is **B - very good**.

Date: June 3, 2024   Signature: