THESIS SUPERVISOR'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Autonomous road crossing with a mobile robot**
Author's name:	**Jan Vlk**
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Cybernetics
Thesis reviewer:	Mgr. Martin Pecka, Ph.D.
Reviewer's department:	Department of Cybernetics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment — challenging

How demanding was the assigned project?

The assignment of the thesis required the student to study and understand several state transition formalisms, compare them, choose the most suitable one, and implement an algorithm using this formalism, which can be tested both in simulation and on real robots.

Fulfilment of assignment — fulfilled

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.

The student has successfully fulfilled all requirements. The thesis contains a section describing current state of the art in relevant fields, an analysis of suitability of the existing approaches and software frameworks, and has implemented the road crossing algorithm. Simulation experiments show that even in case of incoming traffic, the robot is able to cross the road in a safe manner (under the assumption of sane behavior of other traffic actors). The algorithm has also been verified and evaluated in a controlled real-world experiment. The only objection is that the set of real-world experiments should be larger and contain more cases. Partly, the unavailability of real platforms was an objective reason why more experiments were not done. However, had the student started experimenting earlier, more experiments would have been sure conducted.

Activity and independence when creating final thesis — A - excellent.

Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.

The approach of the student was very proactive. He regularly attended consultations with the supervisor on which he took notes about what should be done or tried next, and on the next consultation, he usually already had some results to show. The only objection is later start of real-world experimenting than would be ideal.

Technical level — A - excellent.

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

The student has shown the ability to read other scientific works, summarize them, understand the concepts, and extract useful knowledge from them. The technical level of the thesis reflects this – all concepts are properly described with examples and visualizations, the algorithms are clear. The experiments use a well defined metric and are evaluated according to it.

Formal level and language level, scope of thesis	A - excellent.

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 easy to read and understand, uses proper English language. All algorithms, tables and figures are properly displayed and have accompanying text explaining their content.

Selection of sources, citation correctness	A - excellent.

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 student cites a high number of relevant works. Formally, the citations are done in a suitable way.

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.

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.

It was a pleasure to cooperate with Jan Vlk on his bachelor thesis. The student is sufficiently independent, while still eager to follow the supervisor's advice. It was possible do discuss the research topics deeply with Jan and he has shown good ability to understand even complicated topics. The results presented in the thesis are satisfactory and well evaluated.

The grade that I award for the thesis is | A - excellent. |

Date: | 01.06.23 |

Signature:

I. IDENTIFIKAČNÍ ÚDAJE

Název práce:	**Autonomous Road Crossing with a Mobile Robot**
Jméno autora:	**Jan Vlk**
Typ práce:	bakalářská
Fakulta/ústav:	Fakulta elektrotechnická (FEL)
Katedra/ústav:	Katedra Kybernetiky
Oponent práce:	Ing. Vojtěch Spurný, Ph.D.
Pracoviště oponenta práce:	Skupina Multi-robotických systémů, FEL, ČVUT

II. HODNOCENÍ JEDNOTLIVÝCH KRITÉRIÍ

Zadání	Průměrně náročné

Zadání odpovídá svou náročností Bakalářské práci.

Splnění zadání	splněno

Student splnil správně všechny body zadání.

Zvolený postup řešení	správný

Zvolený postup považuji za vhodný pro řešení zadaného problému.

Odborná úroveň	A - výborně

Pro splnění zadání se musel student seznámit s ROS vývojovým prostředím včetně Gazebo simulátoru. Z odborného hlediska hodnotím práci výborně.

Formální a jazyková úroveň, rozsah práce	B - velmi dobře

Závěrečná práce je psaná v anglickém jazyce. Z jazykového hlediska je práce na vysoké úrovni. Text neobsahuje překlepy nebo gramatické chyby. Během čtení textu mi chyběla část, která zasazuje práci do kontextu řešené problematiky ve světě. Student má tuto část popsanou v rámci sekce diskuze, která je umístěna před závěrem práce. Ze strany čtenáře bych tuto sekci přesunul do úvodu práce, tak jak je to obvyklé u vědeckých publikací. Rozsah práce je větší než je u bakalářských prací obvyklé.

Výběr zdrojů, korektnost citací	A - výborně

V práci bylo použito 31 referencí, které byly v textu správně ocitovány.

Další komentáře a hodnocení

—

III. CELKOVÉ HODNOCENÍ, OTÁZKY K OBHAJOBĚ, NÁVRH KLASIFIKACE

V sekci 5.2.2, která ukazuje funkčnost v simulovaném prostředí, jsou výsledky prezentovány pomocí grafů vzdáleností robota od vozidel. Například první uvažovaný scénář uvažuje 2 vozidla na silnici, kterou se robot snaží přejít, ale graf na obrázku 5.3 obsahuje 3 vozidla. Podobně je to u ostatních simulovaných scenářů. Můžete to prosím vysvětlit?

Přestože se nepovedlo realizovat experiment s reálným robotem v prostředí s provozem, tak předloženou závěrečnou práci hodnotím klasifikačním stupněm **A - výborně**.

Datum: 12. června 2018   Podpis: