

I. IDENTIFICATION DATA

Thesis name:	Random Access in Mobile Networks with Beamforming
Author's name:	Rong-Zhang Li
Type of thesis :	master
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Telecommunication Engineering
Thesis reviewer:	Michal Vondra
Reviewer's department:	Škoda auto, a.s.

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The assignment of the thesis requires, among others, derivation of an analytical model for the random access procedure with beamforming including its verification with simulations. The thesis difficulty of the assignment is challenging.	

Satisfaction of assignment	fulfilled
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
The assignment has been completely fulfilled. I have no reservations.	

Method of conception	correct
<i>Assess that student has chosen correct approach or solution methods.</i>	
The student progresses from reviewing the related literature through identifying research gaps to proposing its own analytical model and its evaluation. The selected approach is correct and completely in line with the standards of research work.	

Technical level	A - excellent.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
Based on the literature review, the research gap is correctly identified and properly explained. The main contribution of the thesis lies in a proposal of a new analytical model for random access procedure with beamforming in 5G TDD mmWave system, which is thoroughly described. Finally, the model is verified while the evaluation of the accuracy of the proposed model is done.	

Formal and language level, scope of thesis	C - good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
The overall formal level is good while the language level is average. The thesis contains a large number of repeating typos.	

Selection of sources, citation correctness	A - excellent.
<i>Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.</i>	
The selected sources are relevant and of very high quality (mostly reviewed articles or standards from 2017 - 2019). From this perspective, the thesis fulfills the highest requirements.	

Additional commentary and evaluation
<i>Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.</i>

In the section of Numerical results, an influence of the parameter A_k is discussed. It would be good to show the dependency of the parameter on other parameters in a figure.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

The overall work is very good and exceeds the standards of master theses. After some modifications and proofreading, the thesis could be submitted to an international conference with a high chance of acceptance.

Questions:

1. In your thesis, you assumed the situation when a high number of devices simultaneously perform a random access procedure. Could you give an example of such a situation from real life?
2. In figure 5.1b, the curve expressing 16 beams in simulation shows a sudden deviation from the curve expressing analytical calculation – could you explain the reason?

I evaluate handed thesis with classification grade **A - excellent**.

Date: **17.6.2019**

Signature: