

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 supervisor:	Doc. Ing. Zdeněk Bečvář, Ph.D.
Supervisor's department:	Department of Telecommunication Engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The topic requires a deep study of standardization documents. Moreover, the thesis delivers detailed analytical model for system which is fully in line with standardization; this implies many constraints on analytical modelling so the modelling is not trivial.	

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 thesis fulfills and covers all the objectives planned in the assignment.	

Activity and independence when creating final thesis	B - very good.
<i>Assess that student had positive approach, time limits were met, conception was regularly consulted and was well prepared for consultations. Assess student's ability to work independently.</i>	
Activity and independence of the student was on very good level, the student was always well prepared for meetings and often come up with new ideas. However, the student was behind schedule most of the time.	

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>	
The student efficiently exploits the knowledge gained during his studies and from literature. The thesis contains novel models of two key performance indicators of random access procedure in cellular networks with beamforming. The models are comprehensively analyzed and confirmed via simulations. Discussion of results could be elaborated in more details.	

Formal and language level, scope of thesis	B - very good.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
The thesis is in general well written, but some parts are written in a complicated way. There are some typos, formatting issues, and grammar errors in text. However, the language level is still good considering the fact that student is not native English speaker. In electronic version of DP, the assignment is missing.	

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 novelty and added value of the thesis are clearly stated and defined. Related works are described in the thesis, but more details (e.g., in a standalone section with related works) could justify and stress novelty even better. Citations are used in a correct way and in line with conventions in the field.	

Additional commentary and evaluation

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.

The models are derived based on 3GPP standards, thus, we can expect their exploitation in design of algorithms for random access procedure for future mobile networks. Theoretical results and correctness of the models are confirmed via simulations. The work is planned to be submitted to a conference after the defense. The student is involved in double degree with NTUST.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation.

The shown ability to understand and solve a practical problem using mathematical tools. The student was active during his work on the thesis and he demonstrated the ability to work independently and to solve even very complex problems requiring a wide range of knowledge.

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

Date: **13.6.2019**

Signature: