

Opponent's Review of the Bachelor's Thesis

Thesis name: SMART SENSORS AND THEIR APPLICATION IN MONITORING RESPIRATORY RATE
Author's name: Wusu Sorie Nanday Kamara
Study programme: B 3944 Biomedical Technology
Field of study: 3901R032 – Biomedical Technology
Academic year: 20/21
Type of thesis: Bachelor
Thesis opponent: prof. MUDr. Karel Cvachovec, CSc., MBA

Evaluation Criteria of the Thesis		Evaluation 1-2-3-4
1. General description		
Quality and topicality of the theoretical knowledge		1
Expression of own ideas and drawing conclusions		2
Professional contribution		2
Level of thesis difficulty		1
2. Evaluation of the practical part		
Formulation and defining of thesis aims and objectives		2
Formulation of hypotheses		2
Suitability of chosen methods and procedures		1
Quality of the results		2
Fulfilment of the aims and objectives		3
3. Work with professional literature		
Quality, topicality, and relevance of the sources		1
Citation and reference correctness		1
4. Formal level		
Fulfilment of the recommended rules and regulations of the formal layout (Methodology of elaboration of final theses)		2
Language level		1
Quality, legitimacy, and understandability of the appendices, tables and figures		2



Verbal comments to the evaluation of the bachelor thesis:

Candidate has chosen very important topic. Respiratory rate is an important parameter of a well-being of the patient and its monitoring is mandatory in many clinical states. For monitoring – which should be non-invasive, whenever possible – quality of sensors and technology used are of most importance. The candidate presented available technologies and commercially available sensors for respiratory inductive plethysmography (RIP). It is a method for monitoring respiratory rate by using a respiratory belt to which smart sensors are attached and surrounding it to the thoracic region and abdomen of a patient. Thesis goals have been met. Different types of sensors suitable for measurements were assessed. Comparison of the relevant properties of selected intelligent sensors and materials was performed. Sensor made of PZT material was tested under static and dynamic conditions and proved to be applicable even in the low frequency range (i.e. as low as 10 Hz) important for measuring respiratory rate. Further research should perhaps be focused on relaxor type materials.

Additional questions for the bachelor thesis defense:

Should the sensors made of PZT material really be called “smart”?

What sensor you would consider appropriate to incorporate into the textile fabric itself (i.e. T-shirts, hospital gowns, etc.)?

Overall evaluation (classification options: excellent, very good, good, unsatisfactory/fail)	Very good
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I recommend the bachelor thesis for defense.

Date:

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Opponent's signature:

