Review of Bachelor's Thesis

Student: Beneš Martin
Title: Counting People Using a PIR Sensor (id 21967)
Reviewer: Kempter Guido, prof., FHV

1. **Assignment complexity** — **considerably demanding assignment**
   In his work, Mr. Martin Benes used so-called PIR sensors to locate people in a room and estimate the number of people in the room. For the feature extraction he used the wavelet transformation and a linear regression analysis with a fuzzy model. He carried out experiments with the prototypes in order to validate the algorithms. Due to the great challenges of multi-person situations it appears appropriate to tolerate some shortcomings that would not be tolerated in standard difficulty work.
2. **Completeness of assignment requirements** — **assignment almost fulfilled**
   He introduces his work through a thorough analysis of the fundamentals of biological generation and physical propagation of temperature radiation, the hardware of PIR sensors, and the process of pattern recognition. For the description and analysis of the PIR signals, he referred to elaborated mathematical algorithms from the literature. Finally, he validates his development work with empirical experiments, but he was not able to analyze multi-person situations.
3. **Length of technical report** — **in usual extent**
   He prepared a usual range 40-50 standard pages. All parts of the technical report are information-rich and really necessary for work.
4. **Presentation level of technical report** — **95 p. (A)**
   The logical structure of the technical report, the scope and continuity of each chapter and the understanding of the work for the reader is excellent.
5. **Formal aspects of technical report** — **92 p. (A)**
   There is nothing serious about the typographic and linguistic aspects of the work.
6. **Literature usage** — **80 p. (B)**
   The technical literature used is largely up-to-date fits the topic of the work, but he uses almost exclusively Internet sources.
7. **Implementation results** — **85 p. (B)**
   He confidently and responsibly performed a sophisticated hardware and software implementation. He was able to take up suggestions for improvement sufficiently.
8. **Utilizability of results**
   The development and investigation results bring new findings in the detection of persons in rooms with the help of PIR sensor.
9. **Questions for defence**
   - Which software developments do you recommend in order to be able to confidently detect the number of people in the room using commercially available PIR sensors?
10. **Total assessment** — **88 p. very good (B)**
    Based on the above comments, I propose a summary grade of **B** with **88** points.

In Brno 9. August 2019

Kempter Guido, prof.
reviewer