Expertise concerning the Master Thesis "Investigations in the energy efficiency of embedded nonvolatile memories of microcontrollers targeted for applications in the Internet of Things"

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Supervision

Since the practical part of this thesis deals with a prototype design and non-standard tools, the author had to be trained adequately. After the initial training he worked independent and proactive.

Logical configuration

The thesis comes with a well defined logic structure. Beginning with a short discourse about design and technology of nonvolatile memories, suited to be used as embedded memory, the author explains their use in microcontrollers and introduces the evaluation board used for the experiments. Next the three experiments are documented by presenting the source code for the micro controller, formulas for the calculation of the average current consumption and finally the obtained data. The conclusion contains a assessment of the results and suggestions for further improvements of the investigated microcontroller prototype.

Content

The specific theme has been edited extensive. The status of the available silicon (prototype microcontroller, nvSRAM technology under development, limited code development and debug tools) had to be taken in account. Substantial effort has been spent to implement the source code for the three experimental applications and to process the obtained data. It would have been appreciated if the information about international research activities would have been more comprehensive.

Findings

The scientific findings are reasonable, but could be presented more offensive.

Formal Criteria

The presented master thesis fits formal requirements with only little concerns. In particular some formulas should be referenced. Complex issues has been adequately illustrated, but especially the screenshots could be edited to be self explaining. An explicit motivation for the approach to use current consumption as a measure of consumed energy is missing. It would have been perfect if the measured power consumption would have been explicitly separated in the parts used for communication, microcontroller logic and embedded nv-memory. Since English is not the native language of the author, spelling and grammar has not been rated.

Conclusion

The thesis well complies with the assigned task. The student worked independent, followed a sientific approach and obtained new findings. The proposed rating is 2.0

Dresden, September 30th 2014

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