

Recommendations for Student Research Papers Submitted to the HSE University NIRS Competition in Technical Sciences and Applied Mathematics

Dear students,

So that experts may effectively assess your work, please make sure to format it in line with the following criteria. These recommendations are general in nature, so not all points listed below must be included in your paper. Below, we provide a sample of the work structure with a short description of each section.

Abstract and keywords

Contents

Introduction (1-2 pages)

Describe in short the subject field. Indicate that your work is focused on finding a solution to a relevant problem (**relevance**) and the new idea you are proposing (**innovation**). Write about the object of your research (**object of research**) and what part of the object of research will be analyzed (**subject of research**) – *for Master's students and graduates*. What is the **key goal of your paper**? What **objectives** should be met in order to achieve this goal?

Main Part

Literature review

- 1) description of contemporary situation in the subject field;
- 2) comparative analysis of current analogues;
- 3) selection of technical solutions/methods/models/algorithms;
(don't forget to provide correct links to sources)

Theoretical section: justify theoretical solutions, prove theorems, describe newly designed / utilized technical solutions/methods/models/algorithms.
and/or

Practical section: describe technical solutions / their implementation / experiments and analyze generated results.

If one of the key results of your work is a technical solution or a software product / IT solution, please provide a photograph of the solution, links to repositories with source codes / run files / information system. You may also provide a link to a video to demonstrate the operation of the technical solution, software solution / hardware and software solution / information system.

Discussion of results

1. Provide a list of key results generated.
2. Specify the academic innovation / practical value of your solution (each aspect of innovation/practical value should be concisely formulated in one sentence. E.g., "... was developed..., and it differs in that it...");
3. Highlight your individual contribution (e.g., "section XXX describes the author's ideas for modifying the algorithm");
4. Possible applications of the generated results;
5. Areas of further research.

Conclusion

Provide a short description of the results (up to one page).

Bibliography

(presented in alphabetical order and in line with GOST standards)

Example:

Bibliography

1. Aggarwal, C. Mining text data / Charu C. Aggarwal, Cheng X. Zha. – USA: Springer Publisher Company, 2012 – 522 с. - **Book**
2. Agrawal, S. Dbxplorer: a system for keyword-based search over relational databases / S. Agrawal, S. Chaudhuri, and G. Das // Proceeding of the 18th Intl. Conference on Data Engineering. – IEEE Computer Society – 2002 – С. 5-16. – **Article in a conference collection**
3. Banerjee, A. A generalized maximum entropy approach to Bregman co-clustering and matrix approximation / A. Banerjee, I. Dhillon, J. Ghosh, S. Merugu, D. Modha // Journal of Machine Learning Research – 2007 – vol. 8 – С. 1919-1986. – **Journal article**
4. Brin, S. The pagerank citation ranking: Bringing order to the web / L. Page, S. Brin, R. Motwani, and T. Winograd // [Электронный ресурс]: Stanford InfoLab, Technical Report 1999-66. – Режим доступа: <http://ilpubs.stanford.edu:8090/422/>, свободный. (дата обращения: 05.04.15). – **Online publication**

Expert’s comments

Dear competition participants,

you are now entering the world of science. Your research papers will be sent for expert review by top academics. So that they can effectively evaluate your work, your paper should meet the formatting rules and standard requirements established for academic papers.

Introduction

In your introduction, you should concisely spell out your plan for future research: describe the subject field, explain its relevance, innovation and practical importance of the selected topic, formulate research goal and objectives, which should be reached in order to achieve this. The experts will review the execution of your research plan in the section “Discussion of results”.

Main Part

Literature review. This is an important section for any type of research. Here, you must analyze the deficits in current solutions and then justify, by relying on links to literature, the relevant, innovation and practicality of your work, as well as the goals and objectives, along with your selected research methodology. A quality overview will allow for an in-depth assessment of your future work.

Innovation. Now that the experts are quite sure that the world cannot go on without your research project, please describe your solution (technical solution, model, method, algorithm, etc.). Your contribution might be small, but still, it is your own innovation, to which the experts will give proper consideration.

Research methodology. When conducting research, it is key to rely on theoretical and/or empirical methods. You can learn about the methods used in your particular field in Wikipedia. Please explain why you have selected a specific method in order to find solutions to your tasks. The experts will appreciate it.

In-depth coverage of your research topic. Your research project should be complete and coherent. Make sure to specify its objectives and provide answers to the questions: What is being studied (object of research)? What part of the object is being examined (research subject)? What is the key goal of your research? What objectives should be met to reach that goal? Which experiments prove that your goal has been achieved? Your answers to these questions will allow the experts to assess your examination of the topic and the completeness of your research.

The practical value of research results. In an ideal situation, the research results could be used in a practical setting. Indicate where and to which extent such results could be used or what the outcome of this should be. If your solution has no practical value, the experts will have nothing to assess.

Conclusion

Your conclusion should describe the results of your work and subsequent conclusions. In this section, you should provide a summary of the “Discussion of results” section. The results indicate what was produced/achieved (should be described using verbs in the past tense). Conclusions mean what can be done in the future based on the achieved results (should be described using verbs in the future tense).

Assessment of work

Your paper may be underrated by the experts if you just submit your term paper / thesis, or an academic article written in co-authorship, or a section of an academic report. Please use these comments and make sure to bring your paper in line with the above recommendations.

It is important to indicate which of the results were achieved by you personally. This is key for the expert reviews, as academic research is commonly carried out in teams, while the experts need to evaluate your personal contribution.

After the abstract, please indicate the keywords and/or classifiers for the respective subject field. For an example of this, check out the personal page of your supervisor. This will help the expert committee select the appropriate reviewers, who can best evaluate your work. Good luck!