PhD thesis review report

Review report for the PhD thesis, submitted by Daurenbayeva Nurkamilya Aldangarovna, from International Information Technology University, Kazakhstan, for the PhD in 8D06102 – Computer and Software Engineering.

The thesis analyses, discusses and proposes models for monitoring and detecting faults in microclimate in different environments. The thesis contains an extensive review of the state of the art. An adequate hardware complex is also described and used for data collection in real environments.

After data collection, different data analysis techniques are used to perform a detailed exploratory data analysis, including different statistical and visualization tools. Data are also transformed, cleaned and prepared for modeling.

After exploratory data analysis and transformation, different machine learning tools are used to detect discrepant samples and hence identify possible faults.

In general the document is well structured, reads well and writing is clear. The topics are well introduced, the methods are sufficiently described, the results are coherent and there is sufficient depth in the analysis. A number of different techniques are used, and they were chosen adequately for the purpose.

The results are sufficiently discussed and compared to the state of the art. The main contributions to the state of the art are relevant and they are clearly highlighted in the document. A notorious fact is that the the student followed the steps of the data analysis process, from problem understanding to analysis of the results, including own data collection in two different environments, for comparison and a deeper analysis of the problem at stake.

The student has also published one review paper in an international Q1 journal and several other papers in other scientific forums.
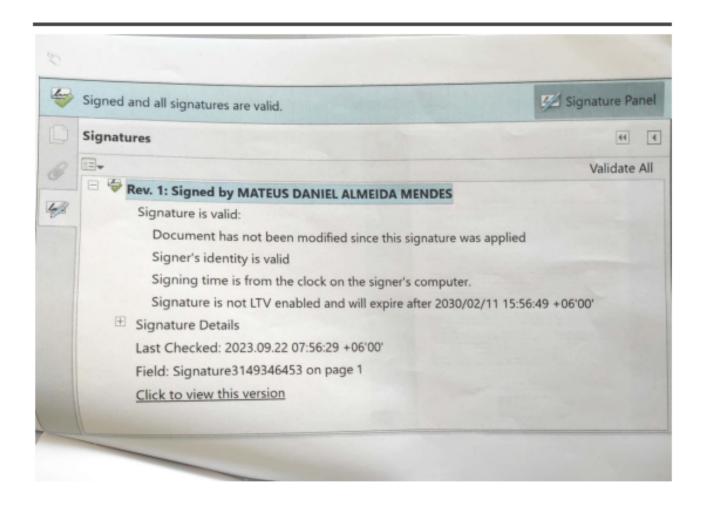
In this context, my opinion is that the work has merit, considering the novelty, the diversity of experiments and the relevance of the topic. Therefore it is ready to proceed to thesis defense where the student deserves to be awarded the degree of Doctor of Philosophy (PhD) in the field of Computer and Software Engineering, under educational program 8D06102.

Coimbra, Portugal, 22 April 2025

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Отзыв на диссертацию на соискание степени доктора философии (PhD)

Отзыв на докторскую диссертацию, представленную Дауренбаевой Нуркамилей Алдангаровной из Международного университета информационных технологий, Казахстан, на соискание ученой степени доктора философии по специальности 8D06102 - Компьютерная и программная инженерия.

В диссертации анализируются, обсуждаются и предлагаются модели для мониторинга и обнаружения ошибок микроклимата в различных средах. В диссертации содержится подробный обзор современного состояния. Также описывается соответствующий аппаратный комплекс, который используется для сбора данных в реальных условиях.

После сбора данных используются различные методы анализа данных для выполнения подробного исследовательского анализа данных, включая различные инструменты статистики и визуализации. Данные также преобразуются, очищаются и подготавливаются для моделирования.

После предварительного анализа и преобразования данных используются различные инструменты машинного обучения для обнаружения ошибок в выборках и, следовательно, выявления возможных ошибок.

В целом документ хорошо структурирован, легко читается и написан понятным языком. Темы хорошо изложены, методы достаточно подробно описаны, результаты последовательны и анализ достаточно глубокий. Используется ряд различных методик, которые были подобраны в соответствии с поставленной целью.

Результаты достаточно подробно обсуждены и сопоставлены с современным уровнем техники. Основные вклады в повышение уровня техники являются актуальными, и они четко выделены в документе. Общеизвестным фактом является то, что докторант прошел все этапы процесса анализа данных, от понимания проблемы до анализа результатов, включая сбор собственных данных в двух разных средах, для сравнения и более глубокого анализа поставленной проблемы.

Докторант также опубликовал обзорную статью в международном журнале QI и несколько других статей на других научных конференциях.

В данном контексте, по моему мнению, работа представляет научную ценность с учетом ее новизны, разнообразия экспериментов и актуальности темы. Таким образом, она готова к защите диссертации, по результатам которой докторант заслуживает присуждения степени доктора философии (PhD) по образовательной программе 8D06102 Компьютерная и программная инженерия.

Коимбра, Португалия, 22 апреля 2025 года

Матеус Мендес
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