Univerza v Mariboru

FRAMEWORK PROGRAMME OF EARLY STAGE RESEARCHER TRAINING[1]

1. BASIC DATA

Mentor's name and surname	**Tina Beranič**	Mentor's register number at ARIS (SICRIS)**:**	**35512**
Mentor's e-mail:	tina.beranic@um.si	Mentor's tel. no.:	041 274 002
Research programme (RP) leader's name and surname:	Marjan Heričko	RP leader's register number at ARIS (SICRIS):	11064
Title of research programme:	Information Systems	RP's Register number at ARIS (SICRIS):	P2-0057
Research organisation (RO) of University of Maribor, where training shall be conducted:	UM FERI	RO Register number at ARIS (SICRIS):	0552-0796
Research field according to ARIS classification:	2.07.05	Research field according to Ortelius classification (EURAXESS)	9.7

2. DEFINITION OF RESEARCH PROBLEM AND GOALS OF DOCTORAL RESEARCH[2]

Starting point of research task of the early stage researcher and its position in the research programme, where the mentor is included, work hypothesis, research goals and foreseen result with emphasis on an original contribution to science:

With the increasing presence of modern IT solutions, their quality and reliability are becoming an essential topic. Ensuring, controlling and maintaining a high level of quality in increasingly complex IT solutions is a current challenge, wherein the emerging fields of Artificial Intelligence (AI) and Machine Learning (ML) can offer significant opportunities for improvement and efficiency gains. Complexity, together with the increasing tendency to automate the development of IT solutions, provides an environment where the aforementioned technologies can contribute to continuous improvement to improve the quality of the final solutions.

[1] Term early stage researcher (ESR) is written in male form and used as neutral for women and men.

[2] Research and study programme of training have to harmonise with contents of the research programme, where the mentor is a member.

The starting point of the early stage researcher's work will be to address the challenge connected to the lack of established approaches, methods, techniques and best practices in the field of AI-augmented quality assurance and quality control of IT solutions. The research work will be directly linked to the activities of the Information Systems Research Programme (P2-0057), whose main vision is to support the continuous improvement of the sustainable development of intelligent information systems based on automated delivery pipelines and data feedback loops that have a positive impact on the complexity management and quality assurance of IS.

The aim of the early stage researcher's work will be to address a new field that combines quality assurance and quality control of IT solutions and artificial intelligence approaches. The research will be focused on the following outcomes: (1) detection, analysis and comparison of existing methods, techniques, methodologies and approaches for the integration of artificial intelligence and machine learning in the field of quality assurance and quality control of IT solutions and services, (2) a systematic literature review in the (sub)fields mentioned in the previous point, (3) a comparison of existing traditional quality assurance best practices and AI-augmented best practices, (4) the design of an improved automated quality assurance and quality control approach supported by artificial intelligence, (5) the validation of the designed approach by applying an exploratory case study method and collecting empirical data. The results mentioned above will also constitute original scientific contributions focusing on the designed approach of quality assurance and quality control of IT solutions and services supported by artificial intelligence.

The following working hypotheses will guide the research work: (1) approaches, methods and techniques of quality assurance and quality control of IT solutions, supported by artificial intelligence, can be implemented in different steps of the quality assurance process, (2) the designed approach, supported by artificial intelligence, increases the effectiveness of quality assurance of complex IT solutions, whereby (2a) the designed automated approach can be integrated into automated IT solution delivery pipelines, and (2b) the designed approach results in data feedback loops that serve as a basis for continuous improvement of IT solutions through the implementation of informed decisions.

The results of the scientific research work will be presented in international impact factor journals, as well as in international and national conferences in the field of software engineering and information systems, all with the aim of appropriate dissemination and validation of the research results in the international research community.

3. STUDY PROGRAMME

Foreseen study programme, to which early stage researcher shall be enrolled in academic year 2024/2025:

Computer Science and Informatics

4. DESCRIPTION OF WORK AND TASKS

In the context of the early stage researcher's research work, we plan to use several research methods in order to achieve the goal of the proposed research. We plan to use: (1) systematic literature review, (2) deductive and inductive method and analysis and synthesis method, (3) design of improved and adapted approach, (4) prototype building, (5) case studies, (6) design evaluation, (7) descriptive methods, (8) comparative methods, and, if necessary, controlled experiments (9).

5. REQUESTED LEVEL OF EDUCATION

Finished second cycle bologna study programme.

6. REQUESTED FIELD OF EDUCATION

Computer Science and Information Technologies, Informatics and Technologies of Communication, Informatics and Data Technologies

7. KLASIUS SRV

17003

8. KLASIUS P

4811

9. REQUESTED KNOWLEDGE

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10. REQUESTED SPECIAL REQUIREMENTS

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11. REQUESTED LANGUAGES

Slovenian, English

12. REQUESTED WORK EXPERIENCE

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13. FORESEEN POSTDOCTORAL TRAINING

The early start researcher's PhD will, due to its topicality and the importance of the integration of the fields of artificial intelligence and quality assurance of IT solutions, constitute an excellent basis for further research also in the form of a postdoctoral project, also through the application of the results and the acquired knowledge in industrial projects at both national and international level.

Mentor's signature:

Tina Beranič

Digitally signed by Tina Beranič
Date: 2024.02.28 11:34:00 +01'00'

Research programme leader's signature:

Marjan Heričko

Digitally signed by Marjan Heričko
Date: 2024.02.28 12:00:00 +01'00'

Name and surname of Dean or authorised person[3]:
prof. dr. Gorazd Štumberger

Signature of dean or authorised person:

Gorazd Štumberger

Digitalno podpisal Gorazd Štumberger
Datum: 2024.03.01 12:12:43 +01'00'

Place and date: Maribor, 1.3.2024

Kliknite ali tapnite tukaj, če želite vnesti besedilo.

Kliknite ali tapnite tukaj, če želite vnesti datum.

Stamp:

SUZANA PUŠAUER

[3] The training program is signed by the dean of the member where the ESR's employment and training will take place.