

## FRAMEWORK PROGRAMME OF EARLY STAGE RESEARCHER TRAINING<sup>1</sup>

### 1. BASIC DATA

Mentor's name and surname	<b>Dušan Gleich</b>	Mentor's register number at <a href="#">ARIS (SICRIS)</a> :	<b>20862</b>
Mentor's e-mail:	Dusan.gleich@um.si	Mentor's tel. no.:	<b>+386 2 2207128</b>
Research programme (RP) leader's name and surname:	Dušan Gleich	RP leader's register number at <a href="#">ARIS (SICRIS)</a> :	<b>20862</b>
Title of research programme:	Telematics	RP's Register number at <a href="#">ARIS (SICRIS)</a> :	<b>P2-0065</b>
Research organisation (RO) of University of Maribor, where training shall be conducted:	Faculty of Electrical Engineering and Computer Science	RO Register number at <a href="#">ARIS (SICRIS)</a> :	<b>0796</b>
Research field according to <a href="#">ARIS classification</a> :	<b>2.07 Telecommunications</b>	Research field according to Ortelius classification (EURAXESS)	<b>15.7 Communication Engineering</b>

### 2. DEFINITION OF RESEARCH PROBLEM AND GOALS OF DOCTORAL RESEARCH<sup>2</sup>

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:

The training of the young researcher will take place in the field of signal processing and design of a short-range radar for the purpose of detecting polarimetric features of objects, like soil moisture, plastic signatures on and below surfaces.. Different principles of the polarimetric processing with radar, one of which is bi-static radar, which represents 2 radars synchronized with each other in time. Research will focus on radar design and artificial intelligence methods for feature extraction and design of feature extraction using polarimetric signatures will be researched. The working hypothesis relates to improving existing methods for polarimetric feature extraction using artificial

<sup>1</sup> Term early stage researcher (ESR) is written in male form and used as neutral for women and men.

<sup>2</sup> Research and study programme of training have to harmonise with contents of the research programme, where the mentor is a member.

intelligence methods and careful design of radar components. In order to achieve the working hypothesis, the research goals are aimed at designing deep learning structures and extraction of Stokes parameters for dual pol radar and four component model for fully polarimetric radar. Research methods include studying the literature, designing deep learning structures and building radar, and publishing research findings in scientific articles.

### 3. STUDY PROGRAMME

Foreseen study programme, to which early stage researcher shall be enrolled in academic year 2025/2026:

Electrical Engineering

### 4. DESCRIPTION OF WORK AND TASKS

Study of scientific literature  
Electronic PCB design  
Simulation of neural networks in Matlab or Python environment  
Writing articles and preparing presentations  
Simulation of polarimetric radar features with simulation tools  
Feature extraction using compact radar and fully polarimetric radar  
Testing of designed electronics  
Flying drones  
Presentation of scientific results at conferences, seminars

### 5. REQUESTED LEVEL OF EDUCATION

Master degree

### 6. REQUESTED FIELD OF EDUCATION

Any technical, Electrical Engineering, Mechatronics, Chemical Engineering, Mathematics, Physics

### 7. KLASIUS SRV

18202 PhD based Education

### 8. KLASIUS P

07: Engineering, production technologies and construction

## 9. REQUESTED KNOWLEDGE

Knowledge of Matlab, Python, C ++, Verilog  
Knowledge of microcontrollers and FPGAs  
Design of PCB circuits for frequencies above 1 GHz  
Knowledge of microelectronics  
Knowledge of Latex, Word, Excel, CorelDraw, Microsoft Visual Studio; Solidworks, Altium Designer  
Working with measuring equipment, Signal Generator, Analyzer, Vector network analyzer  
Performing measurements of antennas and hardware

## 10. REQUESTED SPECIAL REQUIREMENTS

Kliknite ali tapnite tukaj, če želite vnesti besedilo.

## 11. REQUESTED LANGUAGES

English, spoken, written

## 12. REQUESTED WORK EXPERIENCE

Kliknite ali tapnite tukaj, če želite vnesti besedilo.

## 13. FORESEEN POSTDOCTORAL TRAINING

In the case that the doctoral candidat shows outstanding research activities, the post doctoral training can be done in cooperation with German Aerospace Center, DLR, Oberpfaffenhofen or TU Graz, University of Hawai or University of Malaga.

Mentor's signature:

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Research programme leader's signature:

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Name and surname of Dean or  
authorised person<sup>3</sup>:

Kliknite ali tapnite tukaj, če želite vnesti  
besedilo.

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<sup>3</sup> The training program is signed by the dean of the member where the ESR's employment and training will take place.

Signature of dean or authorised person:

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Place and date:

Kliknite ali tapnite tukaj, če želite  
vnesti besedilo.

Kliknite ali  
tapnite  
tukaj, če  
želite vnesti  
datum.

Stamp: