

**A list of the proposed topics of master theses
for the specialty of Radiocommunication Systems and Networks
in the academic year 2019/2020 in english.**

**Please choose a subject and bring the work form (in three copies)
to the Department's Office, room EA 429 to 28/06/2019.
The master's thesis form is available on the Dean's website.**

Master Thesis Subject (Polish)	Prędkość propagacji fal radiowych o różnych częstotliwościach
Master Thesis Subject (English)	Radio Wave Propagation Speed at Different Frequencies
Supervisor	PhD, E.Eng Jarosław Sadowski
Consultant	-----
Aim	The aim of this thesis is investigation of variation in propagation speed of radio waves for positioning systems
Tasks	1. Characterization of propagation of radio waves in real environment 2. Specification of propagation phenomena which influences speed of propagation (phase delay, group delay) 3. Description of methods of modelling the propagation speed at various frequencies
Literature	1. Saakian A.: Radio Wave Propagation Fundamentals, Artech, 2011 2. Barclay L.: Propagation of Radiowaves, 2 nd edition, IET, 2003
Number of contractors	1
Comments	-----

Master Thesis Subject (Polish)	Badanie i analiza odpowiedzi impulsowej kanału radiowego w systemach ultraszerokopasmowych (UWB)
Master Thesis Subject (English)	Research and Analysis of the Radio Channel Impulse Response in Ultra-Wideband (UWB) Systems
Supervisor	PhD, E.Eng Sławomir Jerzy Ambroziak
Consultant	---
Aim	Measurement research of the radio channel impulse response in UWB systems and the analysis of the propagation environment's influence on the properties of radio channel.
Tasks	1. To characterise the ultra-wideband channel and its statistical parameters. 2. To elaborate a measurements plan including scenarios and environments. 3. To perform the radio channel impulse response measurements. 4. To analyse the propagation environment's influence on the properties of the radio channel.
Literature	1. ITU-R P.1407-6, 2017, "Multipath Propagation and Parameterization of its Characteristics". 2. Ambroziak S., 2019, "Measurement Stand and Methodology for Research of the Off-Body and Body-to-Body Radio Channels in WBANs with Different Diversity Schemes", International Journal of Antennas and Propagation, vol. 2019, Article ID 3837190, DOI: 10.1155/2019/3837190. 3. Others.
Number of contractors	1
Comments	-----

Master Thesis Subject (Polish)	Oprogramowanie do badania metod nieortogonalnego wielokrotnego dostępu do kanału (NOMA) w trybie „unicast” dla komunikacji V2X
Master Thesis Subject (English)	Software for Study Methods of Non-Orthogonal Multiple Radio Access (NOMA) in "Unicast" Mode for V2X Communication
Supervisor	PhD, E.Eng. Małgorzata Gajewska
Consultant	-----
Aim	The aim of the work is the implementation of software for study methods of non-orthogonal multiple radio access (NOMA) in "unicast" mode for V2X communication.
Tasks	<ol style="list-style-type: none"> 1. Description of V2X systems 2. Characteristics of the NOMA method 3. Developing a model for estimating interference 4. Software preparation 5. Determining the characteristics and their analysis
Literature	<ol style="list-style-type: none"> 1. Boya Di, Lingyang Song, Yonghui Li, Zhu Han. 2017. „V2X Meet NOMA: Non-Orthogonal Multiple Access for 5G Enabled Vehicular Networks”. IEEE Wireless Communications, Vol. 24 , Issue: 6 , Dec. 2017: 14-21. 2. Higuchi Kenichi. 2015. „Non-orthogonal Multiple Access (NOMA) with Successive Interference Cancellation for Future Radio Access”. <i>IEICE Transactions on Communications</i>, Vol. E98-B, NO. 3. 403-413.
Number of contractors	1
Comments	-----

Master Thesis Subject (Polish)	Analiza uwarunkowań propagacyjnych dla małych komórek systemu 5G
Master Thesis Subject (English)	Analysis of Propagation Conditions for Small-Cells of the 5G System
Supervisor	PhD, E.Eng. Sławomir Gajewski
Consultant	----
Aim	The aim of work is the study on propagation models dedicated to the 5G system
Tasks	<ol style="list-style-type: none"> 1. Introduction 2. General description of 5G NR air interface 3. Comparative analysis of propagation models for 5G radio links 4. Implementation of an analytical model for the study of link loss for different propagation models and conditions 5. Discussion of results 6. Summary
Literature	<ol style="list-style-type: none"> 1. IEEE XPLORE data base 2. Literature available in supervisor 3. 5G systems documentation
Number of contractors	1
Comments	-----

Master Thesis Subject (Polish)	Crowdsourcing jako metoda wykrywania i lokalizacji zakłóceń GNSS
Master Thesis Subject (English)	Crowdsourcing as a Method of Detection and Localization of GNSS Interferences
Supervisor	PhD, E.Eng Jarosław Magiera
Consultant	-----
Aim	Analyze the capabilities of using crowdsourcing techniques for GNSS jammer detection and assess the accuracy of locating the source of interference.
Tasks	<ol style="list-style-type: none"> 1. Investigate the problem of GNSS jamming and its countermeasures. 2. Study existing crowdsourcing solutions for GNSS interference detection. 3. Identify the challenges of interference detection and location. 4. Assess the detection probability and location accuracy through simulation research.
Literature	<ol style="list-style-type: none"> 1. Strizic, Luka, Akos, Dennis M., Lo, Sherman, "Crowdsourcing GNSS Jammer Detection and Localization" 2. Scott, Logan, "J911: The Case for Fast Jammer Detection and Location Using Crowdsourcing Approaches"
Number of contractors	1
Comments	-----

Master Thesis Subject (Polish)	Implementacja oprogramowania symulacyjnego radiowej sieci ad hoc w środowisku symulacyjnym OMNET++
Master Thesis Subject (English)	The Implementation of the Ad Hoc Network Simulation Software in OMNET++
Supervisor	PhD, E.Eng A. Marczak
Consultant	-----
Aim	The aim of the work is to implement the Ad Hoc radio network in the OMNET++ simulation environment.
Tasks	<ol style="list-style-type: none"> 1. Description of the OMNET ++ simulation software. 2. Development of the Ad Hoc network simulation software. 3. Functional tests of the software. 4. Simulation testing.
Literature	Literature can be obtained from the supervisor
Number of contractors	1
Comments	-----

Master Thesis Subject	Implementacja oprogramowania do oceny parametrów
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(Polish)	systemu radiolokalizacyjnego
Master Thesis Subject (English)	Implementation of a Software for Assessment of a Radio Localization System Parameters
Supervisor	PhD, E.Eng Piotr Rajchowski
Consultant	-----
Aim	The goal is to develop a plugin to QGIS software that will allow to analyze the key parameters of a hyperbolic radio localization systems.
Tasks	<ol style="list-style-type: none"> 1. Familiarization with the geographic information system software (QGIS). 2. Implementation of a plugin for QGIS software allowing assessment of parameters of hyperbolic radio localization systems. 3. Proposing a scenario of numerical studies. 4. Realization of numerical studies and analysis of obtained results.
Literature	<ol style="list-style-type: none"> 1. QGIS Project, <i>QGIS user Guide</i>, 8.04.2019. 2. Kegen Yu, Ian Sharp, Jay Guo, <i>Ground-Based Wireless Positioning</i>, John Wiley and Sons, 2009. 3. Jarosław Sadowski, <i>Badanie i analiza systemów radiolokalizacyjnych do zastosowań specjalnych</i> (in polish), Gdańsk University of Technology, 2018. 4. Stelios Mertikas, <i>Error distributions and accuracy measures in navigation: an overview</i>, University of New Brunswick, 1985.
Number of contractors	1
Comments	-----

Master Thesis Subject (Polish)	Wizualizacja danych z odbiornika AIS
Master Thesis Subject (English)	Visualization of Data from Real AIS Receiver
Supervisor	PhD, E.Eng Wojciech Siwicki
Consultant	-----
Aim	The aim of the work is to write a computer program that will visualize position of marine units based on data received from the actual AIS receiver. Created software should enable also to look through a previously recorded data.
Tasks	<ol style="list-style-type: none"> 1. Familiar with AIS system (system, message structure). 2. Choose and implement a database. 3. Write a program, that will read data transmitted from AIS receiver (on RS232) decode it and write it to a database. 4. Include import of historical data form AIS receiver stored in a text files.
Literature	<ol style="list-style-type: none"> 1. „AIS messages”, U.S. Coast Guard Navigation Center 2. http://catb.org/gpsd/AIVDM.html
Number of contractors	1
Comments	-----