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**Application form for financing of research projects**

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<b>Date of submission</b>	
<b>Project No:</b>	<i>(Filled by the University authority)</i>

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<b>FRASCATI</b>	<b>(205)</b> [(20505) , (20506) ] <b>(514)</b> [(51401) , (51408) ] , (51407) <b>(503)</b> [(50318) ] , (50322)

<b>Proposal Title</b>	<b>Opportunities and Methods for Energy Substitution, Savings and Efficiency Improvements in the Hotel Industry</b>
<b>Keywords</b>	<b>Energy; Energy efficiency; Renewable energy sources; Tourism; Hotel management;</b>
<b>FRASCATI classification</b>	<b>(205) Energy</b> [(20505) Unconventional energy sources, (20506) Rational energy use] <b>(514) Tourism and Hospitality</b> [(51401) Hotel industry, (51408) Hotel engineering, (51407) Economics of tourism] <b>(503) Economics</b> [(50318) Economics of Tourism, (50322) Econometrics]



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#### Abstract (max 250 words)

Energy costs in modern hotels take substantial part of total operational costs. Therefore, **energy efficiency increase** and **rational energy utilization** in the hotel industry, which is strongly competitive and exposed to economic, climate and other factors, must be improved. Thus, the contemporary trends should be applied in the line of **substitution of traditional fossil energy with renewable energy sources**. Moreover, it is necessary to introduce “green energy” by **applying latest methods for energy saving and increasing energy efficiency** in hotel industry.

This project attempts to undertake comprehensive analyses (*field research, statistical and techno-economic analysis*) of current status of energy utilization as well as allocating the energy costs in hotel industry. The project intends to implement a set of currently available and to create a set of newly developed techno-economic measures and methods for improving energy status of contemporary hotels by increasing the energy efficiency, maximal savings and energy substitution, thus leading to decrease of total operational costs in hotels. Moreover, the main aim of this project is to **develop and implement new energy policy as well as proposing up-to-date Measures and Action Plan for enhancing energy efficiency and providing economic sustainability and development** of hotel industry.

The research results will have scientific and applicative justification. The research results will be in the line of identifying and developing a model of so called **energy efficient hotel** being fully applicative in the wider Balkan region where the climate is similar to ours.



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## Details of the proposal:

### Introduction

*Provide a critical evaluation on the status of research in the proposed field (Maximum 1 page)*

The prices of energy sources globally are increasing steadily. Respectively, modern hotel facilities in their continuous struggle to provide even more and better services to their customers are becoming highly energy dependent objects.

As a result, the total cost of fuel and energy in modern hotel facilities are becoming a significant item in total operating cost of the modern hotel industry. Hence, increasing the effectiveness and efficiency of hotel management, which as an industry is increasingly competitive and subject to various economic, climatic and other factors of influence, can greatly improve if approaches to change the traditional fossil fuels with renewable energy sources are implemented. It can also contribute to increasing the productivity of the hotels using the so called "**green energy**" and contemporary methods for energy savings and energy efficiency improvements.

Increasing demand of so called "**environmentally sustainable**" or "**green**" hotels or hotel complexes initiates a serious shift in the approach to the development and operation in the contemporary hotel industry, through the development and application of so-called **mass introduction of systematic patterns of green policy in hotel business and tourism**. Although environmental awareness and the needs to preserve nature and climate is not triggered by the hoteliers, nor by the guests with their demands, eventually they created a new trend in the tourism industry that has helped a lot in raising awareness about the importance of global energy saving.

The trend "**green**" worldwide is no longer a novelty, however having in mind that tourism globally and gradually becomes one of the most important industries, one could detect need for serious approach to this issue, the proper analysis of the extent of implementation of renewable energy resources and further implementation of energy efficiency and energy savings policy in the modern hotel facilities. In the same direction is the need to establish appropriate opportunities and methods to increase awareness of the importance of introducing **more ecology in tourism**, improving the energy footprint and reduce the cost of energy as a major requirement for sustainable tourism development on the one hand, and to improve economic performance in this important industry, on the other hand.



## Research Project

*Define the aims and the specific research activities to be pursued during the project period, and provide a comprehensive description of the methods to be used, the advantages of the suggested methodological approach and the research work plan. (Maximum 3 pages)*

### **The main objectives of the proposed project are:**

- Comprehensive analysis of current utilization of energy and locating costs related to energy sources and energy in the hotel industry,
- Identify major factors (*technical, operational and environmental*) that have a dominant influence on the energy efficiency of hotels determining their effects on overall performance of the hotel industry,
- Analysis of the feasibility and economic viability of replacement (*substitution*) of classical fossil fuels with renewable energy sources in this industry,
- Establish a set of measures and methods to increase energy efficiency, reduce costs for energy and maximize energy savings ensuring sustainability of the industry,
- Identify the current energy policy in hotel business and tourism in general, as well as determining the draft measures and Action Plan for the improvement of the Energy Efficiency.

### **The methodology proposed to be used in this project:**

The methods of research will include the use of theoretical and experimental optimization tools, Econometrics and data analysis, statistical processing and mathematical modeling. Through multi-criterion analysis, **a new model of energy sustainable hotel** that would have maximum energy savings, and thus would be achieved optimizing energy costs and maximizing results, should be developed. The most efficient solution in terms of meeting the energy requirements in the optimal activity in specific quantitative and qualitative criteria and sub-criteria (*factors*) to work in the hotel business would be analyzed, constructed and offered. Additionally, tools for mathematical modeling of energy efficiency and adapted to the specific conditions of the modern market-oriented operation in the hotel industry should be provided.

Specifically, the research will be conducted several particular analyses such as:

- 1) Determination and analysis of operational costs, with special emphasis on the energy costs of a typical contemporary hotel of average size (*20 to 50 rooms*) in three or four stars category. This analysis will include a calculation of the different types of costs (*water consumption by guests, electricity consumption to maintain an average temperature in the premises, consumption of washing machines, kitchen, pool, hot water, possibly spa and pool, etc.*); More specifically, we aim to allocate and separate the fixed and variable costs, particularly on the part of the energy costs (*heating, refrigeration, et seq.*);
- 2) Statistical data processing analysis and determining the degree of influence and sensitivity parametric analysis of individual factors on the level of costs and the possibility of reducing them by acting on certain critical factors in the hotel business - replacement (*substitution*) of energy sources, efficient use of available energy and energy savings in the working process;
- 3) Analysis and application of standards for average energy consumption per individual segments in the hotel business (*for different hotel content and equipment*) through comparison and use of modern standards of work in this field in similar facilities in other developed countries with well-established hotel industry (*Spain, Italy, Greece, etc.*);
- 4) Field research in order to scan the current situation regarding the application of environmental and energy standards in the hotel facilities and identifying the factors of influence; and



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- 5) Analysis of possible solutions and determining the proposed models, the draft measures to optimize costs by saving energy and its efficient utilization in hotel operations (*for example, intelligent hotel rooms with energy-saving lamps, lighting control, controlled ventilation, heating and cooling, mobile sensors, using wastewater as a resource to the hotel, using renewable energy sources, use of bio-degradable cleaning products, recycling of waste oil in the kitchen, efficient use of water resources; introduction of measures leading protection policy environment, etc.*);

**Expected results of the project:**

The results of this research project should have scientific and applicative character. The major result of this research should be to identify the draft model of energy efficient, so called "**energy-efficient hotel**" which will be fully applicable to our climate region and beyond for wider Balkan region.

Additionally, as a result of our research, we expected to provide detailed information on the organization, functioning and effects of the energy policy of the hotel industry in Macedonia and the neighboring region. Hence, we will draw conclusions for making future directions in which direction to develop environmental education of employees in the hotel, as well as defining specific guidelines for energy upgrading of existing hotel facilities and construction of new and modern energy efficient and energy sustainable hotel facilities.

Finally, the proposed project is expected to offer an **Action Plan** for energy cost management in terms of replacing fossil and environmentally unacceptable energy resources with renewable energy resources, saving and efficient use of energy and reduce energy costs, thus in advance to create an opportunity for identifying potential savings in case that existing operation methods are fully replaced with some of newly proposed operation methods in the hotel industry.





/PART 2:

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(SCI - Science citation index),

[1] Cingoski, Vlatko and Golubovski, Roman and Dambov, Risto (2014)

. In: Energetika - 2014, 16-18 Oct 2014,

Struga, Makedonija.

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- [2] Stefanov, Goce and **Cingoski, Vlatko** and Stefanova, Elena (2014) *DC/DC* . In: Energetika 2014, 16-17 Oct 2014, Struga, Makedonija.
- [3] **Cingoski, Vlatko** and Golubovski, Roman and Dambov, Risto (2014) - *HOMER©*. In: Energetika - 2014, 16-18 Oct 2014, Struga, Makedonija.
- [4] **Cingoski, Vlatko** and Tanurkov, Dimitar and Papsterevski, Kosta (2014) *Sustainable Energy Production from Old Coal-fired Thermal Power Plants beyond 2016 Utilizing Major Rehabilitation Program*. In: International Environmental Law: Contemporary Concerns and Challenges in 2014. International Environmental Law (2). IUS Software d.o.o. GV Zalozba, Ljubljana, Slovenia, pp. 701-713. ISBN 978-961-247-280-1
- [5] Chitkuseva-Dimitrovska, Biljana and Kukuseva, Maja and **Cingoski, Vlatko** (2014) *LTspice IV as Educational Tool for Teaching Electrical Circuit Analysis*. In: Informaciske Tehnologije - Sadasnost i Buducnost - IT'14. Simpozium Informaciske tehnologije, 19. Univerzitet Crne Gore, Elektrotehnicki fakultet, Podgorica, 2014, pp. 205-208. ISBN 978-86-85775-15-4
- [6] Barvinok, Vitaly and Bogdanovich, Valery and Dokukina, Irina and Barvinok, Alexey and **Cingoski, Vlatko** (2014) *Mathematical Modeling of High Energy Plasma Technologies with Account for some of the Fundamental Problems*. Wulfenia Journal, 21 (2). pp. 104-113. ISSN 1561-882X (**Impact factor 0,267**)
- [7] Barvinok, Vitaly and Bogdanovich, Valery and Dokukina, Irina and Barvinok, Alexey and Bunova, Galina and **Cingoski, Vlatko** (2014) *Mathematical Modeling of Spray Material Acceleration and Heating during the Formation of Plasma Cluster Coatings*. Wulfenia Journal, 21 (2). pp. 94-103. ISSN 1561-882X (**Impact factor 0,267**)
- [8] **Cingoski, Vlatko** (2013) - In: " , 20-21 Dec 2013, Skopje, Makedonija.
- [9] **Cingoski, Vlatko** (2013) . In: : " - " , 20-21 Dec 2013, .
- [10] Sokolovski, Aleksandar and Gelev, Saso and **Cingoski, Vlatko** (2013) *Signature driven e-mail spam detection using network intrusion detection methodology*. In: : " - " , 20-21 Dec 2013, .
- [11] **Cingoski, Vlatko** and Nikolov, Igor (2013) *Reduction of the development cost for SHPP utilizing a container-type mini hydropower plants*. Proceedings of the Hydro 2013 - Promoting the Versatile Role of Hydro.
- [12] Cvetkovski, Saso and **Cingoski, Vlatko** and Nikolov, Igor (2013) - *I*. In: 8 - , 22-24 Sept 2013, Ohrid, Macedonia.
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- [14] Cingoski, Vlatko and Ivanova-Davidovic, Jasna (2012) *The energy security of Southeast Europe - the role of coal*. 7th Conference on Sustainable Development of Energy, Water and Environment Systems – UNESCO – SDEWES - 2012. pp. 76-77. ISSN 1847-7186
- [15] Andonov-Chento, Ilija and **Cingoski, Vlatko** and Nikolov, Igor (2011) *Pump Storage in Macedonia - Opportunities beyond 2020*. In: PowerGEN 2011, 7-9 June 2011, Milan, Italy.



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[16] **Cingoski, Vlatko** and Ivanova-Davidovic, Jasna and Mladenovska, Daniela (2011) *Investment Incentives for Rehabilitation and Performance Improvement of TPP Bitola*. In: Investment Conference, May, 2011, Vienna, Austria. (Unpublished)

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**Principal researcher**

<b>Name Surname</b>	<b>Vlatko Cingoski</b>
<b>Title</b>	<b>Ph.D. (Doctor) in Electrical Engineering</b>
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**Short CV:**

**Vlatko Cingoski** was born in Ohrid, The Republic of Macedonia. He received the B.S, and M.S degrees in electrical engineering from "Sts. Cyril & Methodius" University, Skopje, Republic of Macedonia in 1986 and 1990, respectively. In 1991, he joined the Electric Machinery Laboratory - Faculty of Engineering, Hiroshima University, Japan as a researcher, where he obtained his Ph.D. (*Doctor of Engineering*) degree in 1996 under supervision of Prof. Hideo Yamashita. From 1996 until 1999 he was appointed as Assistant Professor at Electric Machinery Laboratory, Faculty of Engineering, Hiroshima University. In 1999, Dr. Cingoski joined the Electric Power Company of Macedonia as Assistant General Manager for Development and Investments. From 2006 until 2012, Dr. Cingoski held the position of General Manager and the CEO for the JSC Macedonian Power Plants (AD ELEM), the largest energy generation utility company in Macedonia.

His main professional interest include electricity generation, energy policy and management, sustainable energy development and renewable energy resources, development and investments policy in the electricity power sector in the Republic of Macedonia and wider for the Southeast Europe Region energy. He also works as a Project Manager and Project Implementation Manager for several Projects mainly funded by International financing institutions, such as IBRD (The World Bank), EBRD, PHARE, US AID, US TDA, etc.

Additionally, his scientific research interests also include numerical analysis of electromagnetic and thermal field using finite element method and boundary element method, adaptive mesh refinements, pre- and post-processing in FEA, parallel and neural network processing and inverse optimization of various electromagnetic devices.

Cingoski D-r Vlatko is a Senior Member of IEEE (*The Institute of Electrical and Electronics Engineers*), ICS (*International Compumag Society*) and The IEE of Japan, The Japan Society for Applied Electromagnetics and Mechanics (*JSAEM*), and since January 1998, an Editorial Board member of the *JSAEM*. He is also a member of *ZEMAK (Society of Macedonian Power Engineers)* and *MAKO-CIGRE (National Society of CIGRE)*.

He speaks fluently English, Japanese, and Serbo-Croatian language. Dr. Cingoski is married, with one child.

**Scientific papers published in the last 5 years in SCI - Science citation index, indicating the impact factor:**

- [1] **Cingoski, Vlatko** and Golubovski, Roman and Dambov, Risto (2014) *“Technical Aspects and Analysis of Potentials for Distributed Generation and Electricity Supply of Isolated Energy Consumers,”* In: Energetika - 2014, 16-18 Oct 2014, Struga, Macedonia.
- [2] Stefanov, Goce and **Cingoski, Vlatko** and Stefanova, Elena (2014) *“Computer Simulation and Modeling of DC/DC Converters for Control of DC Motors,”* In: Energetika 2014, 16-17 Oct 2014, Struga, Macedonia.
- [3] **Cingoski, Vlatko** and Golubovski, Roman and Dambov, Risto (2014) *“Techno-economic Analysis of Electricity Supply Isolated Power Consumers using the Program Package HOMER<sup>®</sup>,”* In: Energetika - 2014, 16-18 Oct 2014, Struga, Macedonia.
- [4] **Cingoski, Vlatko** and Tanurkov, Dimitar and Papsterevski, Kosta (2014) *Sustainable Energy Production from Old Coal-fired Thermal Power Plants beyond 2016 Utilizing Major Rehabilitation Program.* In: International Environmental Law: Contemporary Concerns and



Challenges in 2014. International Environmental Law (2). IUS Software d.o.o. GV Založba, Ljubljana, Slovenia, pp. 701-713. ISBN 978-961-247-280-1

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[6] Barvinok, Vitaly and Bogdanovich, Valery and Dokukina, Irina and Barvinok, Alexey and **Cingoski, Vlatko** (2014) *Mathematical Modeling of High Energy Plasma Technologies with Account for some of the Fundamental Problems*. Wulfenia Journal, 21 (2). pp. 104-113. ISSN 1561-882X (**Impact factor 0,267**)

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[8] **Cingoski, Vlatko** (2013) "The Role of Pump Storage Hydropower Plants in Electric Power System Security and Flexibility Increase," 1<sup>st</sup> International Conference: Influence of science and technology development on legislative, economics, culture, education and security in the Republic of Macedonia, 20-21 Dec 2013, Skopje, Macedonia.

[9] **Cingoski, Vlatko** (2013) "Needs and Opportunities for the Development and Functioning of the Electricity Exchange Market in the Republic of Macedonia," 1<sup>st</sup> International Conference: Influence of science and technology development on legislative, economics, culture, education and security in the Republic of Macedonia, 20-21 Dec 2013, Skopje, Macedonia.

[10] Sokolovski, Aleksandar and Gelev, Saso and **Cingoski, Vlatko** (2013) *Signature driven e-mail spam detection using network intrusion detection methodology*. 1<sup>st</sup> International Conference: Influence of science and technology development on legislative, economics, culture, education and security in the Republic of Macedonia, 20-21 Dec 2013, Skopje, Macedonia.

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[12] Cvetkovski, Saso and **Cingoski, Vlatko** and Nikolov, Igor (2013) "Development of Hybrid Concentrated Solar Power Plant in TPP Bitola – Part 1," The 8<sup>th</sup> International Conference - , 22-24 Sept 2013, Ohrid, Macedonia.

[13] Cvetkovski, Saso and **Cingoski, Vlatko** and Nikolov, Igor (2013) "Hybrid Concentrated Solar Power Plant in TPP Bitola – Part II – Cost Benefit Analysis," The 8<sup>th</sup> International Conference - , 22-24 Sept 2013, Ohrid, Macedonia.

[14] Cingoski, Vlatko and Ivanova-Davidovic, Jasna (2012) *The energy security of Southeast Europe - the role of coal*. 7th Conference on Sustainable Development of Energy, Water and Environment Systems – UNESCO – SDEWES - 2012. pp. 76-77. ISSN 1847-7186

[15] Andonov-Chento, Ilija and **Cingoski, Vlatko** and Nikolov, Igor (2011) *Pump Storage in Macedonia - Opportunities beyond 2020*. In: PowerGEN 2011, 7-9 June 2011, Milan, Italy. (Unpublished)

[16] **Cingoski, Vlatko** and Ivanova-Davidovic, Jasna and Mladenovska, Daniela (2011) *Investment Incentives for Rehabilitation and Performance Improvement of TPP Bitola*. In: Investment Conference, May, 2011, Vienna, Austria. (Unpublished)

**Participation in research projects:**

Project title	Period	Financed by	Role in the project (PI or participant)
Functional Spaces, Topological and Statistical Aspects and Their	2013-2014	University "Goce Delcev" - Stip	Participant



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Applications in Electrical Engineering			
Development of Energy strategy for the Republic of Macedonia for the period 2008-2020, with view up to 2030	2007-2009	Macedonian Government & Macedonian Academy of Science and Arts	Participant
Strategy for development of Renewable energy resources in the Republic of Macedonia	2008-2010	Macedonian Government & Macedonian Academy of Science and Arts	Participant

**Tasks to be conducted in the frame of the project proposal (timetable):**

- Analyzing the current status of energy efficiency and application in the public sector, with a special focus on hotel industry.
- Analyzing the problems provoked by large energy consumption and its impact on total costs in the line of increasing competitiveness of hotel industry.
- Analyzing the contemporary methods and techniques for improving energy efficiency in housing, tourism and hospitality, with special focus on their application in the contemporary hotel management.
- Investigation potential techno-economic benefits from applied methods for improving energy efficiency in hotel industry.
- Apply the research results in particular hotels in the line of comparing estimated with current results.
- Organizing a round table and workshop for the hotel managers in the line of presenting the methods for energy efficiency by emphasizing the expected benefits.
- Publishing project research results.
- Preparation and participation in study visits, as well as international conferences in order to present the research results.
- Coordination of the research team and research actions among all participants, particularly the involvement of junior researchers.



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**(SCI - Science citation index),**

[1] **Petrevska, B.** (2013). Empirical evidence on calculating optimum hotel accommodation supply, *Wulfenia Journal*, 20(7), 2-15 **(SCI Thomson Reuters: 0.267)**

[2] **Petrevska, B.** (2013). Estimating tourism demand: the case of FYROM, *TOURISMOS: An International Multidisciplinary Journal of Tourism*, 8(1), 199-212 **(SCI SCOPUS: 0.597)**

[3] Koceski, S. & **Petrevska, B.** (2012). Empirical evidence of contribution to e-tourism by application of personalized tourism recommendation system, *Scientific Annals of the "Alexandru Ioan Cuza" University of Iasy - Economic Sciences Series*, 1, 371-383 **(SCI SCOPUS: 0,379 / ICV: 4.51)**

[4] **Petrevska, B.** (2012). Economic impacts of tourism: the evidence of Macedonia, *The Young Economists Journal*, 18, 174-181 **(ICV: 4.27 / EBSCO)**

[5] **Petrevska, B.** (2011). Tourism in the Global Development Strategy of Macedonia: Economic Perspectives, *UTMS Journal of Economics* 2(1): 101-108. **(EBSCO)**

[6] **Petrevska, B.** (2011). Accommodation Capacities in Macedonia as a Factor for Competitive Tourism Supply, *CEA Journal of Economics*, 6(2): 35-42. **(EBSCO)**

[7] **Petrevska, B.** (2012). Tourism contribution to regional development: best practice in Macedonia, *Journal of Community Positive Practices*, 12(3/2012), 425-440. **(EBSCO)**

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- [9] **Petrevska, B.** (2013). Investigating Tourism Seasonality in Macedonia, *UTMS Journal of Economics*, 4(1), 37-44. **(EBSCO)**
- [10] **Petrevska, B. & Koceski, S.** (2013). Web-based platform for enhancing tourism development: an exploratory study, *Journal of Tourism Challenges and Trends*, 6(1), 113-129. **(EBSCO)**
- [11] **Petrevska, B.** (2014). Determinants of tourism contribution to national economy, *CEA Journal of Economics*, 9(1), 37-45. **(EBSCO)**

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## Senior Scientist/ Researcher

<b>Name Surname</b>	<b>Biljana Petrevska</b>
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### Short CV:

**Biljana Petrevska** was born on September 10, 1973 in Stip. During 1992-1996, she studied at the Faculty of Tourism and Hospitality – Ohrid, St. Clement Ohridski University – Bitola, department: Tourism, whereas she finished the studies with an average grade of 9.74.

After the graduation, she enrolled the postgraduate studies at the Faculty of Tourism and Hospitality – Ohrid, St. Clement Ohridski University – Bitola, department: International tourism. She obtained her Msc in 2001 with an average grade of 9.33. In 2010, she obtained a PhD in Economics at the Faculty of Economics – Skopje, St. Cyril and Methodius University – Skopje.

Since 2010, Petrevska is employed as Assistant professor for Economics, at the Faculty of Tourism and Business Logistics, Goce Delcev University – Stip. Besides teaching at graduate studies, she also teaches at postgraduate studies at the department for International tourism and Business Logistics.

Petrevska is an author/coauthor of many papers published in international journals, books and book chapters. She also serves as editor/reviewer in several international journals, lecturer and guest speaker at international summer schools, and participates in several projects.

### Scientific papers published in the last 5 years in SCI - Science citation index, indicating the impact factor:

- [1] **Petrevska, B.** (2013). Empirical evidence on calculating optimum hotel accommodation supply, *Wulfenia Journal*, 20(7), 2-15 (**SCI Thomson Reuters: 0.267**)
- [2] **Petrevska, B.** (2013). Estimating tourism demand: the case of FYROM, *TOURISMOS: An International Multidisciplinary Journal of Tourism*, 8(1), 199-212 (**SCI SCOPUS: 0.597**)
- [3] Koceski, S. & **Petrevska, B.** (2012). Empirical evidence of contribution to e-tourism by application of personalized tourism recommendation system, *Scientific Annals of the "Alexandru Ioan Cuza" University of Iasi - Economic Sciences Series*, 1, 371-383 (**SCI SCOPUS: 0.379 / ICV: 4.51**)
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- [6] **Petrevska, B.** (2011). Accommodation Capacities in Macedonia as a Factor for Competitive Tourism Supply, *CEA Journal of Economics*, 6(2): 35-42. (**EBSCO**)
- [7] **Petrevska, B.** (2012). Tourism contribution to regional development: best practice in Macedonia, *Journal of Community Positive Practices*, 12(3/2012), 425-440. (**EBSCO**)
- [8] **Petrevska, B.** & Koceski, S. (2012). Tourism recommendation system: empirical investigation, *Journal of tourism*, 14, 11-18. (**EBSCO**)
- [9] **Petrevska, B.** (2013). Investigating Tourism Seasonality in Macedonia, *UTMS Journal of Economics*, 4(1), 37-44. (**EBSCO**)



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- [10] **Petrevska, B. & Koceski, S.** (2013). Web-based platform for enhancing tourism development: an exploratory study, *Journal of Tourism Challenges and Trends*, 6(1), 113-129. **(EBSCO)**
- [11] **Petrevska, B.** (2014). Determinants of tourism contribution to national economy, *CEA Journal of Economics*, 9(1), 37-45. **(EBSCO)**

**Participation in research projects:**

Project title	Period	Financed by	Role in the project (PI or participant)
Developing Strategy for total assessment of tourism and hospitality sector in Macedonia (part from the project "Increasing Market Employability")	July-August 2014	Center for Institutional Development CIRa-Skopje	Lead researcher
COST Action IS1204 "Tourism, Wellbeing and Ecosystem Services"	2012-...	European Cooperation in Science and Technology	Participant
"Tur Re Tur"	2010-...	FTBL-UGD	Participant

**Tasks to be conducted in the frame of the project proposal (timetable):**

- To analyze the current status of energy efficiency and application in the public sector, with a special focus on hotel industry.
- To analyze the problems provoked by large energy consumption and its impact on total costs.
- To analyze the contemporary methods and techniques for improving energy efficiency in tourism and hospitality, with special focus on hotel industry.
- To investigate potential economic benefits from applied methods for improving energy efficiency in hotel industry.
- To apply the research results in particular hotels in the line of comparing estimated with current results.
- To participate in a round table and workshop dedicated to presentation of methods for energy efficiency by emphasizing the expected benefits.
- To publish project research results.
- To present the research results in international conferences and other events.



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- [1] IPv6“ Cityr’10, 04-06 2010, OSPF
- [2] IEEE 802.11 Ad Hoc Cityr’10, 04-06 2010, QoS
- [3] 2010, IPv4 IPv6“
- [4] Aleksandar Sokolovski and **Saso Gelev**, “ALGORITHM FOR DISTRIBUTED AGENT BASED NETWORK INTRUSION DETECTION SYSTEM (INDS)” 8 th International Conference for Information Technology –CIIT 2011, Bitola, Macedonia
- [5] Cityr’11 2011, ZigBee



- [6] VOIP IPTV IPv4 IPv6  
Cityr'11 2011,
- [7] "Information System Proposal for Cloud Based File System," Cityr'11 2011,
- [8] **Saso Gelev** and Ognanco Ognanov, " : DVB-C vs IPTV "in Proceedings of the Abstract "INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS" - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [9] Erol Maksud, Marija Sandulovska and **Saso Gelev**, "THE NEW WAY OF COMMUNICATION: SOCIAL NETWORKS" in Proceedings of the Abstract "INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS" - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [10] Jelena Gorgev, Martin Milosavjev-Apostolovski, **Saso Gelev**, Aleksandar Sokolovski, "USABILITY ASPECT OF THE CLOUD SOLUTIONS IN USED IN ENTERPRISE ENVIRONMENT, THE CASE OF MICROSOFT 365" in Proceedings of the Abstract "INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS" - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [11] Jelena Gorgev Milena Zivadinovic, **Saso Gelev** and Aleksandar Sokolovski, ICT BUSINESS VALUE OF USING A CLOUD BASED SYSTEM IN AN ENTERPRISE ENVIRONMENT, THE CASE OF MICROSOFT 365 in Proceedings of the Abstract "INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS" - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [12] Cityr'12 2012, /
- [13] , 2012 ,
- [14] **Sašo Gelev** „UVO ENJE FAZI LOGIKE U SISTEM UPRAVLJANJA VATROM“ 18 nau no stru ni skup Informacione tehnologije IT'13 25,02'01.03.2013, Žabljak, Crna Gora
- [15] **Sašo Gelev** „ INTELIGENTNA ODE A I RA UNARSKA OPREMA KAO MODNI DETALJ “ 18 nau no stru ni skup Informacione tehnologije IT'13 25,02'01.03.2013, Žabljak, Crna Gora
- [16] Biljana Citkuseva Dimitrovska, **Saso Gelev**, Maja Kukuseva „IMPLEMENTATION OF MODIFIED OSPF PROTOCOL IN NETWORK SIMULATOR“18 nau no stru ni skup Informacione tehnologije IT'13 25,02'01.03.2013, Žabljak, Crna Gora
- [17] Vasilija Sarac, **Saso Gelev**, Dragan Minovski, Goce Stefanov, Roman Golubovski „SCADA SYSTEMS IN UPGRADE AND AUTOMATISATION OF S.S. 110/10 kV "DRACEVO" “18 nau no stru ni skup Informacione tehnologije IT'13 25,02'01.03.2013, Žabljak, Crna Gora
- [18] 20-21, 2013, .
- [19] 20-21, 2013,
- [20] 20-



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- 21, 2013,
- [21] A. Sokolovski, **S. Gelev**, V.Cingoski, “Signature driven e-mail spam detection using network intrusion detection methodology”, “Influence of the scientific and technological development in the field of law, economy, culture, education and security in Republic of Macedonia” 20-21 december 2013, Skopje
- [22] M.Bogdanoski, D. Bogatinov and **S. Gelev** “Performance Analysis of Statistical QoS Routing Schemes for Multihop Wireless Ad Hoc Networks”, International Journal of Future Generation Communication and Networking. Vol.7, No.5 (2014), pp. 119-128 (**EBSCO**)

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- 144650-TEMPUS-2008-IT – Video Conferencing Educational Services	15.01.2009 – 14.01.2012	Tempus - Project	
- TEMPUS project JPGR 511342 – iKnow	2010-2012	Tempus - Project	

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**Senior Scientist/ Researcher**

<b>Name Surname</b>	<b>Saso Gelev</b>
<b>Title</b>	<b>PhD (Doctor) of Technical Sciences</b>
<b>Position</b>	<b>Associate Professor</b>
<b>Address</b>	<b>Faculty of Electrical Engineering, University Goce Delcev in Stip</b>
<b>Tel./Fax.</b>	<b>+389 78 203 759</b>
<b>-mail</b>	<b>saso.gelev@ugd.edu.mk</b>

**Short CV:**

**Gelev Asen Saso** was born on 20/08/1966 in Probishtip. Primary education ends in his hometown. After finishing elementary school in 1981, he continued education in general secondary military school "Bratstvo and edinstvo" in Belgrade. In the period 1985-1989 he finished Military Academy "Military Aviation and anti-aircraft defence" in Rajlovec and Zadar.

Master's thesis entitled "A FDI system founded on Kalman filter and state models using the anti-guns" to defend the Electrical Faculty of 02.11.2002 year.

Doctoral dissertation entitled "Synthesis of intelligent control system for rocket fire air defense systems" defends the 14.04.2008 year and obtained PhD in technical sciences.

In the period from 1993 to 1995 he participated in the teaching process in the institution for training and education of military officers (which in 1995 grew into a military academy). From 1997 to 2008 he worked at the Military Academy "General Mihailo Apostolski". From June 2008 to October 2012 staff at the Faculty of Informatics of the "European University Republic of Macedonia". From the end of November 2012 employee of Electrical Engineering at the University "Goce Delchev" in Stip.

Gelev Saso has written four university textbooks, author/co-author of numerous scientific/technical papers, reviewer of several journals, member of the program committees of many international conferences and editor of several collections of papers from conferences.

**Scientific papers published in the last 5 years in SCI - Science citation index, indicating the impact factor:**

- [1] Ljupce Saponziev and **Saso Gelev**, "Implementation of the OSPF routing protocol for IPv6" in Proceedings Cityr'10, 04-06 June 2010, Ohrid, Macedonia
- [2] Doncho Borisov Ognanche Ognanov Mitko Gerard and **Saso Gelev**, "Static Routing QoS for IEEE 802.11 Ad Hoc networks with multiple skip" in Proceedings Cityr'10, 04-06 June 2010, Ohrid, Macedonia
- [3] **Saso Gelev** and Aleksandar Sokolovski "Mechanisms for the transition from IPv4 to IPv6" Yearbook Papers of EURM 2010, Skopje, Macedonia
- [4] Aleksandar Sokolovski and **Saso Gelev**, "ALGORITHM FOR DISTRIBUTED AGENT BASED NETWORK INTRUSION DETECTION SYSTEM (INDS)" 8 th International Conference for Information Technology –CIIT 2011, Bitola, Macedonia
- [5] Boris Mihajlov, Mitko Bogdanoski, **Saso Gelev**, " Review and analysis of wireless sensor networks with particular reference to the performance of ZigBee protocol ," in Proceedings Cityr'11 September 2011, Skopje
- [6] Jelena Gorgev, Aleksandra Petkova, **Saso Gelev** and Aleksandar Sokolovski, "Performance Analysis of the quality of service for VOIP and IPTV IPv4 and IPv6 computer networks "," in Proceedings Cityr'11 September 2011, Skopje
- [7] Aleksandar Sokolovski and **Saso Gelev** "Information System Proposal for Cloud Based File System," in Proceedings Cityr'11 September 2011, Skopje
- [8] **Saso Gelev** and Ognanco Ognanov, "Platform: DVB-C vs IPTV "in Proceedings of the Abstract "INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS" - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [9] Erol Maksud, Marija Sandulovska and **Saso Gelev**, "THE NEW WAY OF



- COMMUNICATION: SOCIAL NETWORKS” in Proceedings of the Abstract “INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS” - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [10] Jelena Gorgev, Martin Milosavjev-Apostolovski, **Saso Gelev**, Aleksandar Sokolovski, “USABILITY ASPECT OF THE CLOUD SOLUTIONS IN USED IN ENTERPRISE ENVIRONMENT, THE CASE OF MICROSOFT 365” in Proceedings of the Abstract “INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS” - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [11] Jelena Gorgev Milena Zivadinovic, **Saso Gelev** and Aleksandar Sokolovski, ICT BUSINESS VALUE OF USING A CLOUD BASED SYSTEM IN AN ENTERPRISE ENVIRONMENT, THE CASE OF MICROSOFT 365 in Proceedings of the Abstract “INTERNATIONAL SCIENTIFIC CONFERENCE FACES OF THE CRISIS” - EUROPEAN UNIVERSITY REPUBLIC OF MACEDONIA Skopje, march 2012
- [12] gnen Gorgievski, **Saso Gelev** "Remote control / monitoring of the pumping station" in Proceedings Cityr'12 September 2012, Skopje
- [13] **Sašo Gelev**, asminka Sukarovska Kostadinovska,, SAFETY IN COMPUTER NETWORKS IN RESPECT OF CONTROL OF ACCESS “,Yearbook of the Faculty of Computer Science UGD, 2012, Stip
- [14] **Sašo Gelev** „ INTRODUCTION OF FUZZY LOGIC IN FIRE CONTROL SYSTEM “18 scientific expert group Information Technology IT'13 25,02'01.03.2013, Žabljak, Montenegro
- [15] **Sašo Gelev** „ SMART CLOTHING AND COMPUTER EQUIPMENT as a fashion accessory “18 scientific expert group Information Technology IT'13 25,02'01.03.2013, Žabljak, Montenegro
- [16] Biljana Citkuseva Dimitrovska, **Saso Gelev**, Maja Kukuseva „IMPLEMENTATION OF MODIFIED OSPF PROTOCOL IN NETWORK SIMULATOR“18 scientific expert group Information Technology IT'13 25,02'01.03.2013, Žabljak, Montenegro
- [17] Vasilija Sarac, **Saso Gelev**, Dragan Minovski, Goce Stefanov,Roman Golubovski „SCADA SYSTEMS IN UPGRADE AND AUTOMATISATION OF S.S. 110/10 kV “DRACEVO” “18 scientific expert group Information Technology IT'13 25,02'01.03.2013, Žabljak, Montenegro
- [18] Zorica Kaevik, Risto Hristov, **Saso Gelev**, Roman Golubovski „ Accident and disaster recovery of computer systems“,International Scientific Conference “Influence of the scientific and technological development in the field of law, economy, culture, education and security in Republic of Macedonia” 20-21 december 2013, Skopje
- [19] **Saso Gelev**, Risto Hristov, Elenior Nikolov, „ Methodology of computer forensics“, International Scientific Conference “Influence of the scientific and technological development in the field of law, economy, culture, education and security in Republic of Macedonia” 20-21 december 2013, Skopje
- [20] Ognen Gorgievski, **Saso Gelev**, Roman Golubovski „Automatic regulation of pumping stations with frequency regulator “,International Scientific Conference “Influence of the scientific and technological development in the field of law, economy, culture, education and security in Republic of Macedonia” 20-21 december 2013, Skopje
- [21] A. Sokolovski, **S.Gelev**, V.Cingoski, “Signature driven e-mail spam detection using network intrusion detection methodology”, “Influence of the scientific and technological development in the field of law, economy, culture, education and security in Republic of Macedonia” 20-21 december 2013, Skopje
- [22] M.Bogdanoski, D. Bogatinov and **S. Gelev** “Performance Analysis of Statistical QoS Routing Schemes for Multihop Wireless Ad Hoc Networks”, International Journal of Future Generation Communication and Networking. Vol.7, No.5 (2014), pp. 119-128 (EBSCO)



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**Participation in research projects:**

<b>Project title</b>	<b>Period</b>	<b>Financed by</b>	<b>Role in the project (PI or participant)</b>
"Development and implementation of algorithms for guidance, navigation and management of moving objects.	2001-2004	Ministry of defence	Participant
- 144650-TEMPUS-2008-IT-Video Conferencing Educational Services	15.01.2009 – 14.01.2012		Participant
- TEMPUS project JPGR 511342 – iKnow	October 2010- October 2012		Participant

**Tasks to be conducted in the frame of the project proposal (timetable):**

- To analyze the current status of energy efficiency and application in the public sector
- To analyze the problems provoked by large energy consumption and its impact on total costs
- To analyze the contemporary methods and techniques for improving energy efficiency
- Modelling and simulation of substitution models of energy sources and energy efficiency improvements
- Design of automation system regulation of energy objects
- Participation in a round table and workshop dedicated to presentation of methods for energy efficiency by emphasizing the expected benefits
- Publishing project research results
- Publishing the research results in international conferences and other events





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(SCI - Science citation index),

- [1] Cingoski V, **Golubovski R**, Dambov R  
HOMER,  
2014, Struga, Macedonia, 16-18 Oct 2014
- [2] Cingoski V, **Golubovski R**, Dambov R  
2014, Struga, Macedonia, 16-18 Oct 2014
- [3] Zlatev Z, **Golubovski R**, Gicev V  
Data Processing of Recorded Motion at Seven-Storey Hotel in Van Nuys, California during Northridge Earthquake in 1994, *V International Conference of Information Technology and Development of Education 2014, Zrenjanin, Serbia, 27 Jun 2014*
- [4] **Golubovski R**  
Affordable PIC BAsed Solution for Photovoltaic Panel Auto Tracking, *XIX Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2014*
- [5] **Golubovski R**  
A Concept of Expert System for Automated ECG Diagnosis, *XIX Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2014*
- [6] Gorgievski O, Gelev S, **Golubovski R**  
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- [7] Gelev S, **Golubovski R**, Hristov R, Nikolov E  
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- [8] Kaevic Z, Hristov R, Gelev S, **Golubovski R**  
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- [9] **Golubovski R**  
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", Skopje, Macedonia, 20-21 Dec 2013
- [10] Sarac V, Gelev S, Minovski D, Stefanov G, **Golubovski R**  
SCADA Systems in Upgrade and Automatization of S.S. 110/10 kV "Dracevo", *XVIII Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2013*
- [11] **Golubovski R**  
Multiplatform DAQ Synchronization Technique of a Biaxial Shaking Table for Structural Testing, *XVIII Scientific-Professional Information Technology Conference 2013, Zabljak,*



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Montenegro, Feb 2013

[12] **Golubovski R**

Methods of Biopotentials Software Processing, *XVIII Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2013*

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### Senior Scientist/ Researcher

<b>Name Surname</b>	<b>Roman Golubovski</b>
<b>Title</b>	<b>Doctor in Computer Sciences</b>
<b>Position</b>	<b>Assistant Professor</b>
<b>Address</b>	<b>Faculty of Electrical Engineering, Radovish,</b>
<b>Tel./Fax.</b>	
<b>-mail</b>	<b>roman.golubovski@ugd.edu.mk</b>

### Short CV:

**Roman Golubovski** is born on 3 May 1970, in Skopje. He enrolled in the graduate studies of Computer Science, Information Tehcnology and Process Automation with the Faculty of Electrical Engineering in Skopje, in the academic year 1988/1989, and graduated on 23 Mar 1993, obtaining the Graduated Electrical Engineer degree (Dipl-EEng) with average mark of 8.29.

Immediately after graduation he enrolled the postgraduate studies of Robotics, Artificial Intelligence and Flexible Technological Systems with the Faculty of Electrical Engineering in Skopje, defending his MSc thesis on 28 Feb 2000, obtaining the Master of Science in Electrical Engineering degree.

In 2007 he enrolled the Doctoral studies with the Faculty of Contemporary Sciences and Technologies - South East Europe University in Tetovo, working on his thesis "Methods of Biomedical Instrumentation and Automated Diagnosis". He completed his thesis with successful R&D projects with the Institute of Physiology - Medical Faculty in Skopje, the Dept. of Electrical Engineering with the University of Liverpool and the Dept. of Engineering Science with the University of Oxford. He defended his DSc thesis on 14 Oct 2010, obtaining the Doctor in Computer Sciences degree.

He begun his professional career with his first employment (6 Jan 1994 - 28 Feb 1997) with the Institute of Heart Diseases (Cardiology Clinic) - Medical Faculty in Skopje, working in the Dept. of Electrophysiology on the implantable pacemakers and defibrillators as well as being involved with R&D activities in the domain of biopotentials processing and analysis, leading him to his research stays with the Universities of Liverpool (Mar - May 1999) and Oxford (Aug - Sep 2002).

During Nov 2002 - Aug 2003 he was engaged by the Institute of Earthquake Engineering and Engineering Seismology in Skopje (IZIIS) as consultant and project leader for implementation of modern PXI platform for the instrumentation and data acquisition of the shaking table and the field measurements equipment.

His second employment was with the Public enterprise for Postal Services (1 Mar 1997 - 5 Dec 2007), working as System Administrator of the countrywide corporate network.

His next employment was with the Institute of Earthquake Engineering and Engineering Seismology (6 Dec 2007 - 11 Jun 2012), leading the development of data acquisition and DSP applications for structural testing and seismic analysis.

Meantime, he was invited as lecturer by the MIT University in Skopje, for their IT studies, in the summer semester of 2008/2009.

His next employment (12 Jun - 20 Sep 2012) was with the firm Kaskada Ltd. in Bitola, developing advanced embedded electronic systems.

His current employment (from 21 Sep 2012) is with the Faculty of Electrical Engineering - University "Goce Delcev" in Stip, as Assistant Professor in the fields "Modelling, Simulation and Analysis of Complex Industrial Processes" and "Computer Control of Complex Industrial Processes", lecturing in the graduate and postgraduate (MSc) studies.

Also, in the academic 2013/2014 and 2014/2015 he is invited lecturer in the CS/IT studies with the Faculty of Natural Sciences and Mathematics in Skopje.

Dr. Roman Golubovski has presented and published papers in several international and domestic conferences.



Scientific papers published in the last 5 years in SCI - Science citation index, indicating the impact factor:

- [1] Cingoski V, **Golubovski R**, Dambov R  
Techno-economic Analysis of Electrical Supply Isolated Power Consumers using the Program Package HOMER, *International Symposium Energetics 2014, Struga, Macedonia, 16-18 Oct 2014*
- [2] Cingoski V, **Golubovski R**, Dambov R  
Technical Aspects and Analysis of Potentials for Distributed Generation and Electricity Supply of Isolated Energy Consumers, *International Symposium Energetics 2014, Struga, Macedonia, 16-18 Oct 2014*
- [3] Zlatev Z, **Golubovski R**, Gicev V  
Data Processing of Recorded Motion at Seven-Storey Hotel in Van Nuys, California during Northridge Earthquake in 1994, *V International Conference of Information Technology and Development of Education 2014, Zrenjanin, Serbia, 27 Jun 2014*
- [4] **Golubovski R**  
Affordable PIC BAsed Solution for Photovoltaic Panel Auto Tracking, *XIX Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2014*
- [5] **Golubovski R**  
A Concept of Expert System for Automated ECG Diagnosis, *XIX Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2014*
- [6] Gorgievski O, Gelev S, **Golubovski R**  
Automated Regulation of Pump Stations with Frequency Converter, *I International Conference on the Influence of the Scientific and Technological Development in the field of Law, Economy, Culture, Education and Security in the Republic of Macedonia, Skopje, Macedonia, 20-21 Dec 2013*
- [7] Gelev S, **Golubovski R**, Hristov R, Nikolov E  
Methodology of Computer Forensics, *I International Conference on the Influence of the Scientific and Technological Development in the field of Law, Economy, Culture, Education and Security in the Republic of Macedonia, Skopje, Macedonia, 20-21 Dec 2013*
- [8] Kaevic Z, Hristov R, Gelev S, **Golubovski R**  
Computer Disaster and Disaster Recovery, *I International Conference on the Influence of the Scientific and Technological Development in the field of Law, Economy, Culture, Education and Security in the Republic of Macedonia, Skopje, Macedonia, 20-21 Dec 2013*
- [9] **Golubovski R**  
Using Mathematical Morphology in Processing Signals, *I International Conference on the Influence of the Scientific and Technological Development in the field of Law, Economy, Culture, Education and Security in the Republic of Macedonia, Skopje, Macedonia, 20-21 Dec 2013*
- [10] Sarac V, Gelev S, Minovski D, Stefanov G, **Golubovski R**  
SCADA Systems in Upgrade and Automatization of S.S. 110/10 kV "Dracevo", *XVIII Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2013*
- [11] **Golubovski R**  
Multiplatform DAQ Synchronization Technique of a Biaxial Shaking Table for Structural Testing, *XVIII Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2013*
- [12] **Golubovski R**  
Methods of Biopotentials Software Processing, *XVIII Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2013*



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**Participation in research projects:**

<b>Project title</b>	<b>Period</b>	<b>Financed by</b>	<b>Role in the project (PI or participant)</b>

**Tasks to be conducted in the frame of the project proposal (timetable):**

- Analyzing the current status of energy efficiency and application in the public sector
- Modelling and simulation of various methods of energy source substitutions and energy efficiency improvements
- Design of systems for automatic regulation of energy objects
- Analyzing the problems provoked by large energy consumption and its impact on total costs
- Analyzing the contemporary methods and techniques for improving energy efficiency
- Modelling and simulation of substitution models of energy sources and energy efficiency improvements
- Design of automation system regulation of energy objects
- Participation in a round table and workshop dedicated to presentation of methods for energy efficiency by emphasizing the expected benefits
- Publishing project research results
- Publishing the research results in international conferences and other events



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(SCI - Science citation index),

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[1] **Kukuseva Paneva M, Chitkuseva Dimitrovska B, Velkov T, Cingoski V**, FEMM , II  
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 , Skopje, Macedonia, 30-31 Oct 2014.

[2] **Chitkuseva Dimitrovska B, Cingoski V**  
 LTspice IV as educational tool for teaching electrical circuit analysis, *XIX Scientific-*



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*Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2014*

[3] **Chitkusheva Dimitrovska B**, Kukusheva Paneva M, Sasho Gelev

Implementation of modified OSPF protocol in network simulator, XVIII *Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2013*

[4] **Chitkusheva B**, Tentov A

Adding a modified protocol module in NCTUNS network simulator,  
*X Scientific-Infnternational Conference ETAI 2011, Ohrid, Macedonia, Sep 2011*

[5] Lazarova M, **Chitkusheva B**

Exploring student's use of e-learning systems in higher education, International conference  
*ICT Innovations 2011, Skopje, Macedonia*

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**Junior Researcher**

<b>Name Surname</b>	<b>Biljana Chitkusheva Dimitrovska</b>
<b>Title</b>	<b>Master in electrical engineering and Information technologies</b>
<b>Position</b>	<b>Teaching assistant</b>
<b>Address</b>	<b>Krste Misirkov 14 - Stip</b>
<b>Tel./Fax.</b>	
<b>-mail</b>	<b>biljana.citkuseva@ugd.edu.mk</b>

**Short CV:**

**Biljana Chitkusheva Dimitrovska** was born on 27th March 1982, in Shtip. She finished elementary school in 1996 with excellent grades. In 2000 finished high school “Slavco Stojmenski” in mathematical section. During high school she took part in several competitions in area of math and she was awarded.

In the academic year 2000/2001 she started graduate studies of Electronics and Telecommunication with the Faculty of Engineering in Skopje. Graduated with defending her degree thesis on 23 March 2007, obtaining the Graduated Electrical Engineer degree.

In 2009 she enrolled the Master studies with the Faculty of Electrical engineering and Information technologies in Skopje, defending her Msc. thesis “Implementation of modified routing protocol in network simulator” on 11<sup>th</sup> April 2012 mentored by professor Aristotel Tentov, obtaining the Master of Science in Electrical Engineering degree.

In the time period from 2005 to 2007 she was leading courses in the educational computer center “Poliproekt”, teaching Microsoft office, C++ programming language, math, electrical engineering and electronics. After graduation, from June 2008 to February 2011, she worked in Telecommunication operator “Cabletel” as net administrator, responsible for quality of services: Internet, television and telephony and department of Customer care, as well as in equipment (routers, multiplexers).

Her current employment (from 13 Dec 2012) is with the Faculty of Electrical Engineering - University “Goce Delcev” in Stip, as Teaching Assistant in the fields “Modelling, Simulation and Analysis of Complex Industrial Processes” and “Computer Control of Complex Industrial Processes”.

Msc. Biljana Chitkusheva Dimitrovska has presented and published papers in several international and domestic conferences.

**Scientific papers published in the last 5 years in SCI - Science citation index, indicating the impact factor:**

- [1] Kukusheva Paneva M, **Chitkusheva Dimitrovska B**, Cingoski V  
FEMM as educational tool for solving problems in electromagnetism,  
2<sup>st</sup> International Conference: Influence of science and technology development on legislative, economics, culture, education and security in the Republic of Macedonia, 30-31 Oct 2014, Skopje, Macedonia.
- [2] **Chitkusheva Dimitrovska B**, Cingoski V  
LTspice IV as educational tool for teaching electrical circuit analysis, XIX Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2014
- [3] **Chitkusheva Dimitrovska B**, Kukusheva Paneva M, Sasho Gelev  
Implementation of modified OSPF protocol in network simulator, XVIII Scientific-Professional Information Technology Conference 2013, Zabljak, Montenegro, Feb 2013
- [4] **Chitkusheva B**, Tentov A  
Adding a modified protocol module in NCTUNS network simulator, X Scientific-Infnternational Conference ETAI 2011, Ohrid, Macedonia, Sep 2011
- [5] Lazarova M, **Chitkusheva B**  
Exploring student’s use of e-learning systems in higher education, International conference ICT Innovations 2011, Skopje, Macedonia



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**Participation in research projects:**

Project title	Period	Financed by	Role in the project (PI or participant)

**Title of the MSci or PhD theses:**

“Modelling of the systems for energy supply of isolated energy systems”

**Tasks to be conducted in the frame of the project proposal (timetable):**

- Participation in the field research, data collection and data analysis
- Analyses of the simulation results and modeling of renewable energy resources
- Data processing, parametric & trend analysis and results comparison
- Applying the research findings in articles supporting the Master thesis
- Presenting the research results in conferences and seminars



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**Junior researcher:**

<b>Name Surname</b>	<b>Nikola Trajkov</b>
<b>Title</b>	<b>BA in tourism</b>
<b>Position</b>	<b>Msc Candidate</b>
<b>Address</b>	<b>FTBL – Gevgelija</b>
<b>Tel./Fax.</b>	<b>078 906 109</b>
<b>-mail</b>	<b>nikolatrajkovgvg@yahoo.com</b>

**Short CV:**

**Nikola Trajkov** is born on August 8, 1991 in Gevgelija. During 2010-2013, he studies at the Faculty of Tourism and Business Logistics – Gevgelija, Goce Delcev’ University - Stip, department: Tourism, with an average grade of 9.68.

After the graduation, he enrolls the postgraduate studies at the Faculty of Tourism and Business Logistics at the Goce Delcev’ University - Stip, department: International tourism.

Nikola Trajkov is a participant in one research project. He is currently preparing his Master thesis.

**Participation in research projects:**

<b>Project title</b>	<b>Period</b>	<b>Financed by</b>	<b>Role in the project (Participant)</b>
Developing Strategy for total assessment of tourism hospitality sector in Macedonia (part from the project “Increasing Market Employability”)	July-August 2014	Center for Institutional Development CIRa-Skopje	Participant

**Title of the MSci or PhD theses:**

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**Tasks to be conducted in the frame of the project proposal (timetable):**

- Participation in the field research
- Data processing
- Applying the research findings in articles supporting the Master thesis
- Presenting the research results in conferences and seminars



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./	+38978699495
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**Junior researcher**

<b>Name Surname</b>	<b>Tomche Velkov</b>
<b>Title</b>	<b>graduated electrical engineer</b>
<b>Position</b>	<b>M.Phil</b>
<b>Address</b>	<b>s.Borievo, Bosilovo</b>
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<b>-mail</b>	<b>tomce_v@hotmail.com</b>

**Short CV:**

**Tomche Velkov** is born on 22 July 1990, in Strumica. He enrolled in the graduate studies of Automatic control systems with the Faculty of Electrical Engineering in Radovish, in the academic year 2009/2010, and graduated on 7 November 2013, obtaining the Graduated Electrical Engineer degree with average mark of 8.88.

Immediately after graduation he enrolled the postgraduate studies of Automation and processes with the Faculty of Electrical Engineering in Shtip.

From December 2013, parallel with his postgraduate studies, he works as a volunteer at the Faculty of Electrical Engineering, at the University of „Goce Delcev” in Shtip. In May 2012, visited practical teaching at A.D. „MEPSO” – Skopje, that lasted one month.

**Scientific papers published in the last 5 years in SCI - Science citation index, indicating the impact factor:**

**Participation in research projects:**

<b>Project title</b>	<b>Period</b>	<b>Financed by</b>	<b>Role in the project (PI or participant)</b>

**Title of the MSci or PhD theses:**

„Ambient control system in greenhouse”

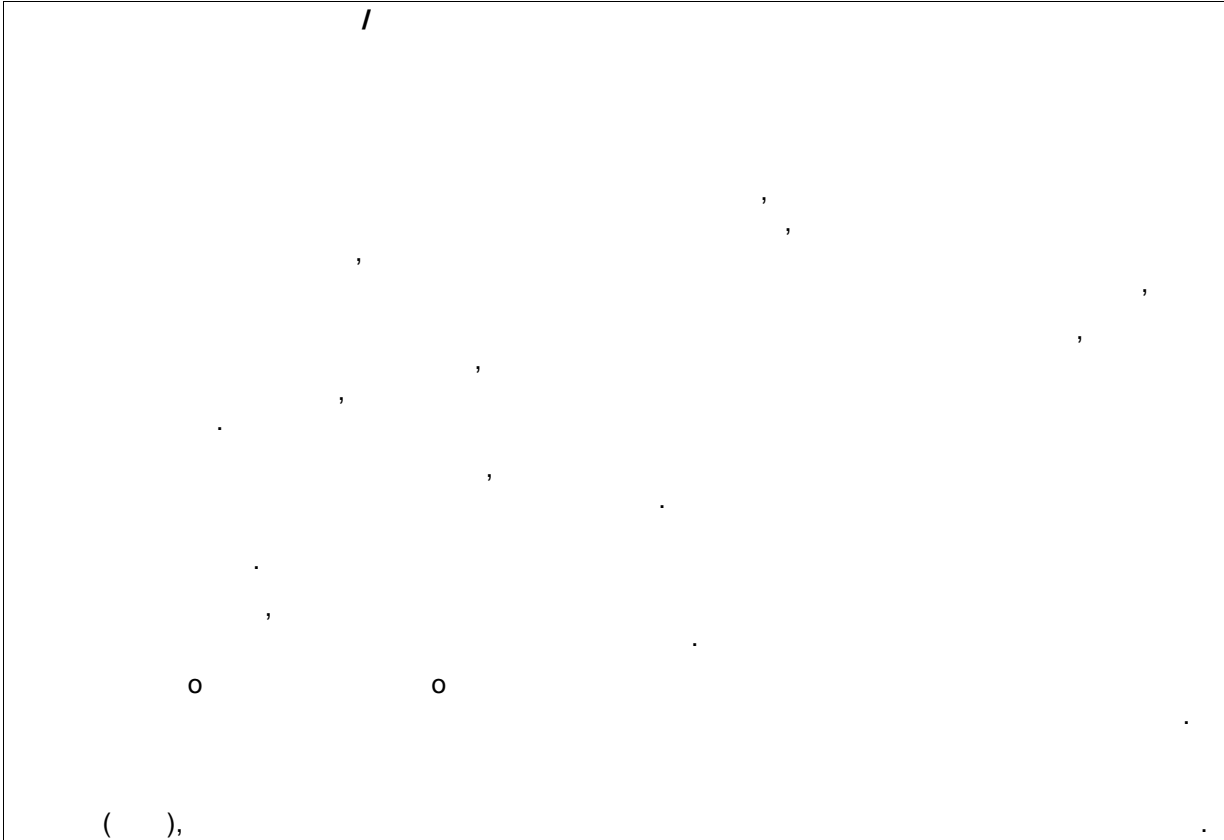
**Tasks to be conducted in the frame of the project proposal (timetable):**

- Participation in the field research
- Data processing
- Applying the research findings in articles supporting the Master thesis
- Presenting the research results in conferences and seminars



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**Research infrastructure**

**Facilities available in the Researchers Team’s laboratory (if applicable)**

*Provide a detailed list of the infrastructure and equipment available and necessary for the proposed research*

Having into consideration the type and methodology proposed for execution of the research, during the initial phase of the research, most of the activities will have a field character, that will be realized through direct meetings, interviews and analysis of the current situation with the problem of rising energy costs and locating key points where they are located within the hotel industry.

Lately, in the second part of the research, it will be carried out analysis of the results, comparison between similar or identical hotel objects and analysis of effective methods for increasing energy efficiency. Additionally, modeling and simulation of the proposed technical solutions in a real environment is envisaged too.

For the realization of the proposed research, our research team will use existing personal software solutions or work on adjusting or developing new ones. It will also use simulation programs and systems for modeling energy efficient systems and their implementation in a real environment connected directly or indirectly with the hotel industry.

During the implementation of the project and if it is necessary, a purchase and/or upgrade of certain software packages and/or any hardware inventory might be done.

Some expenditure could be allocated in respect with the project results presentation.

Given that this project will be implemented during the working time when some of the members of the research team will use the so-called mechanism of flexible working time (FRV), commitments of any additional research resources by UGD, are not expected.



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420		130.000,00	130.000,00	260.000,00
421	,	0,00	0,00	0,00
423	,	0,00	0,00	0,00
424		0,00	0,00	0,00
425		0,00	0,00	0,00
426	,	70.000,00	70.000,00	140.000,00
		<b>200.000,00</b>	<b>200.000,00</b>	<b>400.000,00</b>

**Financial Plan**

**Expenditures (in MKD)**

No.	Purpose	First year	Second year	Overall
420	Travel and daily allowances	130.000,00	130.000,00	260.000,00
421	Expenditures for Heating, communication, transport	0,00	0,00	0,00
423	Small laboratory inventory, chemicals, other materials.	0,00	0,00	0,00
424	Repairment of instruments and servicing	0,00	0,00	0,00
425	Services by contract	0,00	0,00	0,00
426	Seminars, Conferences and Journals	70.000,00	70.000,00	140.000,00
<b>TOTAL COSTS</b>		<b>200.000,00</b>	<b>200.000,00</b>	<b>400.000,00</b>





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