

**НАСТАВНО–НАУЧНОМ ВЕЋУ
ЕЛЕКТРОТЕХНИЧКОГ ФАКУЛТЕТА
СЕНАТУ УНИВЕРЗИТЕТА У ИСТОЧНОМ САРАЈЕВУ**

Предмет: Извештај комисије о пријављеним кандидатима за избор у академско звање ванредног професора, ужа научна област Телекомуникације

Одлуком Наставно-научног већа Електротехничког факултета Универзитета у Источном Сарајеву, број ННВ: 03-1463/19 од 16.10.2019. године, именовани смо у Комисију за разматрање конкурсног материјала и писање извештаја по конкурсном објављеном у дневном листу “Глас Српске“ од 2.10.2019. године, за избор у академско звање ванредног професора, ужа научна област Телекомуникације.

ПОДАЦИ О КОМИСИЈИ

1. Др Владимир Милошевић, редовни професор, председник

Научна област: Електротехника и рачунарство

Научно поље: Техничко-технолошке науке

Ужа научна област: Телекомуникације и обрада сигнала

Датум избора у звање: 29.12.1997. године

Универзитет: Универзитет у Новом Саду

Факултет/академија: Факултет техничких наука

2. Др Владо Делић, редовни професор, члан

Научна област: Електротехника и рачунарство

Научно поље: Техничко-технолошке науке

Ужа научна област: Телекомуникације и обрада сигнала

Датум избора у звање: 28.03.2013. године

Универзитет: Универзитет у Новом Саду

Факултет/академија: Факултет техничких наука

3. Др Мирјана Симић-Пејовић, ванредни професор, члан

Научна област: Електротехника и рачунарство

Научно поље: Техничко-технолошке науке

Ужа научна област: Телекомуникације

Датум избора у звање: 25.11.2016. године

Универзитет: Универзитет у Београду

На претходно наведени конкурс пријавио се један (1) кандидат:

1. Др Мирјана (Милан) Максимовић, доцент

На основу прегледа конкурсне документације, а поштујући прописане члан 77. Закона о високом образовању („Службени гласник Републике Српске“ бр. 73/10, 104/11, 84/12, 108/13, 44/15, 90/16), чланове 148. и 149. Статута Универзитета у Источном Сарајеву и чланове 5., 6. и 39. Правилника о поступку и условима избора академског особља Универзитета у Источном Сарајеву, Комисија за писање извештаја о пријављеним кандидатима за изборе у звања, Наставно-научном већу Електротехничког факултета и Сенату Универзитета у Источном Сарајеву подноси следећи извештај на даље одлучивање:

ИЗВЕШТАЈ

КОМИСИЈЕ О ПРИЈАВЉЕНИМ КАНДИДАТИМА ЗА ИЗБОР У ЗВАЊЕ

I ПОДАЦИ О КОНКУРСУ
Одлука о расписивању конкурса, орган и датум доношења одлуке
Предлог: Наставно-научно веће Електротехничког факултета, број: 03-1246/19 од 13.09.2019. године Одлука: Сенат Универзитета у Источном Сарајеву, број: 01-С-390-III/19 од 27.09.2019. године
Дневни лист, датум објаве конкурса
„Глас Српске“, 2.10.2019. године
Број кандидата који се бира
Један (1)
Звање и назив уже научне области, уже образовне области за коју је конкурс расписан, списак предмета
Звање: ванредни професор Ужа научна област: Телекомуникације
Број пријављених кандидата
Један (1)

II ПОДАЦИ О КАНДИДАТИМА
ПРВИ КАНДИДАТ
1. ОСНОВНИ БИОГРАФСКИ ПОДАЦИ
Име (име једног родитеља) и презиме
Мирјана (Милан) Максимовић
Датум и место рођења
23.10.1982, Сарајево, СФРЈ
Установе у којима је кандидат био запослен
Електротехнички факултет, Универзитет у Источном Сарајеву
Звања/радна места
Асистент, виши асистент и доцент на Универзитету у Источном Сарајеву
Научна област
Телекомуникације
Чланство у научним и стручним организацијама или удружењима
Члан техничког комитета за аутоматiku Института за стандардизацију Босне и Херцеговине Члан техничког комитета за телекомуникације Института за стандардизацију Босне и Херцеговине Члан техничког комитета за заштиту од пожара Института за стандардизацију Босне и Херцеговине Члан удружења Алумни асоцијација инжењера електротехнике, Источно Сарајево
2. СТРУЧНА БИОГРАФИЈА, ДИПЛОМЕ И ЗВАЊА
Основне студије/студије првог циклуса
Назив институције, година уписа и завршетка
Електротехнички факултет, Универзитет у Источном Сарајеву, од 2001. до 2006. године
Назив студијског програма, излазног модула
Аутоматика и електроника
Просечна оцена током студија, стечени академски назив
8,92; Дипломирани инжењер електротехнике, Аутоматика и електроника
Постдипломске студије/студије другог циклуса
Назив институције, година уписа и завршетка

Електротехнички факултет, Универзитет у Источном Сарајеву, од 2006. до 2009. године
Назив студијског програма, излазног модула
Телекомуникације
Просечна оцена током студија, стечени академски назив
10,00; Магистар техничких наука – Област телекомуникације
Наслов <u>магистарског</u> /мастер рада
Развој сензора и примјена бежичних сензорских мрежа у савременој пољопривреди и заштити животне средине
Ужа научна област
Телекомуникације
Докторат/студије трећег циклуса
Назив институције, година уписа и завршетка (датум пријаве и одбране дисертације)
Електротехнички факултет, Универзитет у Источном Сарајеву Пријава: 28.05.2013. године; Одбрана: 20.10.2014. године
Наслов докторске дисертације
Унапређење различитих сегмената бежичних сензорских мрежа и аспеката њихове примјене у савременим системима за праћење и контролу пожара у затвореном простору
Ужа научна област
Телекомуникације и електроника
Претходни избори у звања (институција, звање и период)
1) Електротехнички факултет, Универзитет у Источном Сарајеву, асистент, октобар 2006. - децембар 2009., 2) Електротехнички факултет, Универзитет у Источном Сарајеву, виши асистент, избор: децембар 2009. - новембар 2014., реизбор: децембар 2014. - март 2015. 3) Електротехнички факултет, Универзитет у Источном Сарајеву, доцент, март 2015. до данас.
3. НАУЧНА/УМЕТНИЧКА ДЕЛАТНОСТ КАНДИДАТА
Радови пре првог и/или последњег избора/реизбора
а) Рад у часопису међународног значаја
1. Mirjana Maksimović, Vladimir Vujović, Branko Perišić, Vladimir Milošević, <i>Developing a fuzzy logic based system for monitoring and early detection of residential fire based on thermistor sensors</i>, Computer Science and Information Systems, Vol. 12, No. 1, pp. 63-89, ISSN 1820-0214 (Print) 2406-1018 (Online), DOI 10.2298/CSIS140330090M, 2015 (импакт фактор: 0.575)

2. **Mirjana Maksimović**, Vladimir Vujović, Vladimir Milošević, *Applying Fuzzy logic and data mining techniques in WSN for determination residential fire confidence*, Journal of Engineering Science and Technology Review 7 (4): 89-96, Kavala Institute of Technology, Greece, **2014**
3. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, *A DSM for a Modeling RESTful Sensor Web Network*, 10th Annual International Conference on Information Technology & Computer Science, ISBN: 978-618-5065-40-9, Athens Journal of Technology Engineering, pp. 209-222, **2014**
4. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, *Development of DSM Graphical Editor for RESTful Sensor Web Networks Modeling*, Scientific Bulletin of the "Politehnica" University of Timisoara, Romania, Transactions on Automatic Control and Computer Science, Vol. 59(73), No. 2, pp. 131-140, ISSN 1224-600X, **2014**
5. **Mirjana Maksimović**, Vladimir Vujović, Vladimir Milošević, *Fuzzy Logic and Wireless Sensor Networks – A Survey*, Journal of Intelligent and Fuzzy System 27:877–890, DOI: 10.3233/IFS-131046, **2014 (импакт фактор: 0.936)**
6. **Mirjana Maksimović**, Vladimir Vujović, Vladimir Milošević, *Mining and predicting rate of rise heat detector data*, Facta Universitatis, Series: Working and Living Environmental Protection, Vol. 10, No 1, pp. 37 – 51, **2013**
7. **Mirjana Maksimović**, Goran M. Stojanović, Milan Radovanović, Mirjana Malešev, Vlastimir Radonjanin, Goran Radosavljević, Walter Smetana, *Application of a LTCC sensor for measuring moisture content of building materials*, Construction and building materials, Vol. 26, No. 1, pp. 327-333, ISSN: 0950-0618, **2012 (импакт фактор: 2.8)**

в) Рад у часопису националног значаја

1. **Мирјана Максимовић**, Владимир Вујовић, *Системи за праћење и контролу пожара у затвореном простору*. Гласник Института за стандардизацију Босне и Херцеговине, бр. 3-4, стр. 4-8, ISSN 1840-2860, **2014**
2. **Mirjana Maksimović**, Vladimir Vujović, *Comparative analysis of data mining techniques applied on wireless sensor network data for fire detection*, Journal of Information Technology and Applications - JITA 3(2013) 2:65-77, **2013**
3. Snježana Milinković, **Mirjana Maksimović**, *Using decision tree classifier for analyzing students' activities*, Journal of Information Technology and Applications - JITA 3(2013) 2:87-95, **2013**
4. **Mirjana Maksimović**, Goran Stojanović, *Analysis of geometry influence on performances of capacitive pressure sensor*, Electronics, Vol. 13, No. 2, pp. 41-45, **2009**

г) Рад саопштен на скупу националног и међународног значаја штампан у целини

1. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, *Collaboration in Software Engineering classroom*, 12th IEEE International Conference on Emerging eLearning Technologies and Applications - ICETA 2014, Starý Smokovec, Slovakia, December **2014**
2. **Mirjana Maksimović**, Vladimir Vujović, Vladimir Milošević, Branko Perišić, *Evaluating the optimal heat detector deployment for fire detection*, International Conference Engineering and Telecommunication En&T 2014, Moscow, Russia, November **2014**
3. **Mirjana Maksimović**, Vladimir Vujović, Vladimir Milošević, *Analysis of various parameters influence on heat detector response*. International Scientific Conference "UNITECH 2014", pp. 226-230, Gabrovo, Bulgaria, **2014**
4. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, *The different active learning*

strategies in Software Engineering and their effectiveness. 7th International Conference of Education, Research and Innovation – ICERI. Seville, Spain, November **2014**

5. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, *Comparative analysis of DSM Graphical Editor frameworks: Graphiti vs. Sirius*, 23rd International Electrotechnical and Computer Science Conference ERK, Portorož, B:7-10, Slovenia, **2014**
6. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, *Sirius: a rapid development of DSM graphical editor*, 18th International Conference on Intelligent Engineering Systems – INES 2014, Tihany, Hungary, pp. 233-238, ISBN 978-1-4799-4616-7, **2014**
7. Dijana Kosmajac, Vladimir Vujović, **Mirjana Maksimović**, Nikola Davidović, Branko Perišić, *MasterBroker: REST oriented Service Broker*, 18th International Conference on Intelligent Engineering Systems – INES 2014, Tihany, Hungary, pp. 227-232, ISBN 978-1-4799-4616-7, **2014**
8. **Mirjana Maksimović**, Vladimir Vujović, Nikola Davidović, Vladimir Milošević, Branko Perišić, *Raspberry Pi as Internet of things hardware: Performances and Constraints*, 1st International Conference on Electrical, Electronic and Computing Engineering - IcETRAN 2014, Vrnjačka Banja, Serbia, **2014**
9. Vladimir Vujović, **Mirjana Maksimović**, *Raspberry Pi as a Wireless Sensor Node: Performances and Constraints*, The 37th International ICT Convention – MIPRO 2014, pp. 1247-1252, ISSN 1847-3938, ISBN 978-953-233-078-6, Opatia, Croatia, **2014**
10. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, Vladimir Milošević, *A Graphical Editor for RESTful Sensor Web Networks Modeling*, SACI 2014 IEEE 9th International Symposium on Applied Computational Intelligence and Informatics, pp. 61-66, Timisoara, Romania, May **2014**
11. **Мирјана Максимовић**, *Примјена фази логике у БСМ за детекцију пожара*, ИНФОТЕХ-ЈАХОРИНА бр. 13, стр. 337-342, март **2014**.
12. **Мирјана Максимовић**, *Оптимално распоређивање сензора за детекцију дима и топлоте*, ИНФОТЕХ-ЈАХОРИНА бр. 13, стр. 349-354, март **2014**.
13. **Mirjana Maksimović**, *Mining and predicting temperature and smoke sensors data*, INFOTEH-Jahorina, Vol. 13, pp. 343-348, **2014**.
14. **Mirjana Maksimović**, Vladimir Vujović, Vladimir Milošević, *The fire possibility prediction based on fuzzy logic generated dataset*, YU INFO 2014, pp.. 492-534, ISBN: 978-86-85525-13-1, Кораоник, **2014**
15. **Mirjana Maksimović**, Vladimir Vujović, Vladimir Milošević, Branko Perišić, *Increasing the lifetime of hexagonal deployed Wireless SensorWeb network*, ICIST 2014 - 4th International Conference on Information Society and Technology, pp. 131-136, ISBN: 978-86-85525-14-8, Кораоник, **2014**
16. Владимир Вујовић, **Мирјана Максимовић**, Бранко Перишић, *Примјена софтверских алата у процесу изучавања софтверског инжењерства*, Зборник радова/XX скуп Трендови развоја „Развојни потенцијал високог образовања“, ISSN: 978-86-7892-594-8, Paper No. T4.3-5, стр. 215-218, Копаоник **2014**
17. **Mirjana Maksimović**, Vladimir Vujović, Dijana Kosmajac, *Fuzzy rule reduction influence on system's accuracy*, 21st Telecommunications forum TELFOR 2013, pp. 920-923, Belgrade, Serbia, November **2013**
18. Vladimir Vujović, **Mirjana Maksimović**, Dijana Kosmajac, Vladimir Milošević, Branko Perišić, *Web Integration of REST Enabled Wireless Sensor Networks for Fire Detection*, International conference on Applied Internet and Information Technologies AIIT, pp. 30-35, Zrenjanin, Serbia, **2013**

19. Vladimir Vujović, Ines Perišić, **Mirjana Maksimović**, Igor Kekeljević, *The role of visualization in Building Management Systems*, International conference on Applied Internet and Information Technologies АИТ, pp. 102-107, Zrenjanin, Serbia, **2013**
20. Snježana Milinković, **Mirjana Maksimović**, *Analyzing the impact of administrative and demographic data on students' performance*, International conference on Applied Internet and Information Technologies АИТ, pp.421-425, Zrenjanin, Serbia, **2013**
21. Сњежана Милинковић, **Мирјана Максимовић**, *Коришћење Decision Tree класификатора за анализирање студентских активности*, V Међународни научно-стручни скуп информационе технологије за е-образовање, IteO, стр. 83-92, Бања Лука, септембар **2013**
22. Marijana Čosović, **Mirjana Maksimović**, Slobodan Obradović, *Role of Data Mining techniques in Wireless Sensor Networks*, XI International Conference, ETAI Ohrid, Macedonia, September **2013**
23. **Мирјана Максимовић**, Владимир Вујовић, *Улога Интернет базираних бежичних сензорских мрежа у заштити од пожара*, ИНФОТЕХ-ЈАХОРИНА, бр. 12, стр. 629-634, март **2013**
24. **Мирјана Максимовић**, Нада Цинцар, *Пројектовање и моделовање система противпожарне заштите у сервер сали*, ИНФОТЕХ-ЈАХОРИНА, бр. 12, стр. 80-85, март **2013**
25. Marijana Cosovic, **Mirjana Maksimovic**, *Sensor Networks Energy Efficiency in Subthreshold Voltage Domain*, INFOTEN-JAHORINA, Vol. 12, pp. 445-449, March **2013**
26. Божидар Поповић, Наташа Поповић, **Мирјана Максимовић**, Ениса Омановић-Микличанин, Нејра Пушчул, *Одређивање концентрације хидроген пероксида у воденим растворима методом хемилуминисценције*, ИНФОТЕХ-ЈАХОРИНА, бр. 11, стр. 36-40, март **2012**
27. Слободан Недић, **Мирјана Максимовић**, *Неуниформна филтерска банка за пренос података*, ИНФОТЕХ-ЈАХОРИНА, бр. 11, стр. 411-416, март **2012**,
28. **Мирјана Максимовић**, Горан Радосављевић, Милан Радовановић, Горан Стојановић, *Примена бежичног LC сензора за мерење концентрације воде у грађевинским материјалима*, ИНФОТЕХ-ЈАХОРИНА, бр. 9, Е-V-5, стр. 714-718, **2010**
29. **Мирјана Максимовић**, Горан Стојановић, *Анализа утицаја геометрије на перформансе капацитивног сензора притиска*, ИНФОТЕХ-ЈАХОРИНА, бр. 8, Е-I-9, стр. 384-388, **2009**
30. **Мирјана Максимовић**, Маријана Ћосовић, *БЕР перформансе дигиталних шема базираних на ПСК модулацијама*, Индел, Бања Лука, **2008**

Радови после последњег избора/реизбора (релевантно за избор)

а) Објављена научна књига

1. **Mirjana Maksimović**, Enisa Omanović-Miklićanin, Almir Badnjević, *Nanofood and Internet of Nano Things, For the next generation of agriculture, and food sciences*, Springer Nature Switzerland AG, eBook ISBN 978-3-030-15054-9, DOI 10.1007/978-3-030-15054-9 Hardcover ISBN 978-3-030-15053-2, **2019**

Food demands, in terms of quantity and quality, have been rising remarkably due to increasing worldwide population. In order to respond to these demands, huge investments have been done in the agriculture and food industry that face with numerous challenges such as climate changes, urbanization, the lack of arable land and depletion of natural resources. The inclusion of novel technological

approaches in the agri-food sector, such as nanotechnology, Internet of Things and Internet of Nano Things, have resulted in the revolutionization of this sector, enabling to produce more food using the same or less resources compared to the traditional approach.

Understanding the fundamentals of nanotechnology and Internet of Nano Things in the agri-food sector is quite challenging. Therefore, this book contributes to basic and applied knowledge in this field by promoting a better and more accurate understanding of nanotechnology and Internet of Nano Things utilization in the agriculture and food industry. It has been tried to emphasize as many benefits and risks as possible of nanotechnology and Internet of Nano Things in food production, processing, packaging and distribution.

The book starts with the question “Is nanofood, food produced using nanotechnology techniques and tools during its cultivation, production, processing, or packaging, food of our future?” The rest of the book presents a comprehensive analysis of nanotechnology and IoNT benefits and risks, in order to respond to this question.

Nanotechnology and Internet of Nano Things are emergent disciplines that due to their unique and attractive properties have become present in numerous application domains. The benefits they bring in the agriculture and food industry are astonishing and ultimately contribute to the enhanced human health, well-being and life quality. The entire food supply chain has been modernized using nanotechnology and Internet of Nano Things. The precision farming practices, real-time and remote monitoring and feedback, enhanced food production, quality, and safety are the outcomes of the modern agri-food sector.

Alongside novel smart and innovative processes, devices and products, a number of nanotechnology and Internet of Nano Things - associated risks require special attention and detailed analysis. Despite immense improvements in the agri-food industry, nanotechnology and Internet of Nano Things utilization introduce new types of risks. Food safety aspects, nanotoxicity, nanomaterials release and exposure, their influence on human health, and environment, privacy and security issues of Internet of Nano Things, moral and ethical issues, and regulatory frameworks are subjects of intensive research. Giving the answers to these questions is crucial for nanotechnology and Internet of Nano Things to show their full potential in the agri-food sector.

The possible solution for the creation of sustainable agriculture and food industry is seen in the greener future, where nanotechnology and Internet of Nano Things will be substituted with their greener alternatives. Green nanotechnology and Green Internet of Nano Things undoubtedly present a big step forward to the environmentally, economically and socially sustainable agri-food sector. Still, the main obstacle for nanotechnology and Internet of Nano Things omnipresence in the agriculture and food industry is consumer acceptance, due to knowledge gaps about potential risks and a lack of internationally agreed regulatory frameworks. The significant progress regarding these issues can be expected in years to come.

Based on the performed research and analysis of pros and cons, the end of the book shows the SWOT analysis of nanotechnology and Internet of Nano Things usage in the agri-food industry. Despite numerous risks, the benefits these technologies bring in the food production are immense and surpass current disadvantages.

In summary, this book assesses the current challenges and opportunities for the next generation of agriculture and food science. Examining the role of nanotechnology and the application of related tools and techniques to transform the future of food, it also discusses in detail nanotechnology in food production, processing and packaging, as well as the benefits of and concerns regarding nanofoods (nanotoxicity and food forensics). Considering the potential of Internet of Things to revolutionize agriculture and the food industry by radically reducing costs and improving productivity and profits, the book highlights the necessity of integrating Internet of Things and nanotechnology into the next generation of agriculture and food science. Further, it presents a detailed analysis of Internet of Nano Things implementation, together with the goals that have to be met in order to achieve significant improvements in the agri-food sector. In addition it explores a range of challenges, risks, and concerns that have a direct or indirect impact on nanotechnology and Internet of Nano Things implementation in

agriculture and the food industry. In closing, it discusses the use of green nanotechnology and green Internet of Nano Things in order to create smart, safe, and sustainable agriculture and healthy food.

б) Монографска студија/поглавље у научној књизи међународног значаја

- 1. Mirjana Maksimovic, Miodrag Forcan, *Internet of Things and big data recommender systems to support Smart Grid*. In: O. Khalid, S.U. Khan, A. Y. Zomaya (Eds.). *Big Data Recommender Systems: Volume 2: Application paradigms*. Institution of Engineering and Technology – IET, pp. 145-172; ISBN 9781785619786. DOI: 10.1049/PBPC035G, London, United Kingdom, **2019****

Since its appearance, the Internet of Things (IoT) has completely revolutionized almost all aspects of our lives. Among present and potential numerous and diverse applications of IoT, its utilization in the energy sector is of particular interest. The IoT inclusion in the power industry and Smart Grid (SG) evolution opens a whole world of high-potential opportunities to optimize the grid operation. The realization of SGs utilizing smart metering technology or advanced metering infrastructure with bidirectional IoT-based communication between demand and utility could improve existing energy balancing procedures. Keeping energy consumption and supply in balance with minimal operating costs and optimal grid conditions is not an easy task, especially in presence of renewable energy sources. As the IoT is established on the utilization of a large number of smart things/devices that generate a prodigious amount of data on a daily basis, successfully managing big data represents a key issue. In order to obtain valuable insights and knowledge from data gathered, the appliance of big data analytics is demanded. Hence, effective analysis and utilization of a massive amount of diversity of data that arrive at high speed and can be of uncertain provenance are mandatory in the process of obtaining valuable insights and enable the creation of knowledge-based recommender systems. Big data analytics applied to data gathered from smart meters could be used to make valuable recommendations regarding consumption prediction, demand response and management programs, voltage and frequency control, state estimation, and power quality. The overall operation of SG could be certainly optimized in various aspects by using large-scale near real-time measurements. The general aim of this chapter is to provide an overview of ongoing scientific research, recent technological innovations and breakthroughs, and big data analytics role in making recommendation systems that will facilitate the development and evolution of future global energy systems.

- 2. Mirjana Maksimovic, *Fog Computing in Internet of Things-Based E-Health System — Challenges and Opportunities for Managing Health-Associated Data*. In: J. M. R.S. Tavares, B. Kishore Mishra, R. Kumar, N. Zaman, M. Khari (Eds.). *Handbook of e-Business Security*, pp. 137-165; CRC Press - Auerbach Publications., ISBN: 9781138571303, **2018****

This chapter represents the essence of Internet of Things (IoT)-supported healthcare, lists the types and structures of health-related data, and considers and analyzes the present approaches for handling IoT-generated healthcare data. It emphasizes the necessity of Fog infrastructure integration in an IoT-based healthcare system. The chapter discusses the analysis of data management in a Fog-assisted and IoT-based healthcare system as well as manners to enable high level of privacy and security, efficient resource utilization, and standardization issues. It presents an attempt to get as much as possible insight and knowledge regarding Fog computing and its significance in managing data in the IoT-powered healthcare system. The properties of healthcare data make them unique and difficult to measure. The healthcare data come from various sources and various formats. The chapter also explores the directions for future development and implementation of the proposed prototype as well as the course of future research.

- 3. Mirjana Maksimovic, *Greening the Future: Green Internet of Things (G-IoT) as a Key Technological Enabler of Sustainable Development*. In N. Dey et al. (Eds.), *Internet of Things and Big Data Analytics Toward Next-Generation Intelligence*, Studies in Big Data 30, Springer International Publishing AG, pp. 283-313; ISBN: 978-3-319-60434-3, DOI:10.1007/978-3-319-60435-0_12, **2018****

New technologies and the revolution of Internet of Things (IoT) fuel innovation in every area of science and human life, providing anytime and anywhere access to information in novel ways and contexts and brings people, processes, data and things as well as places, organizations and facilities together in

unprecedented ways. Despite the numerous benefits IoT offers, manufacturing, distribution, and utilization of IoT products and systems are the resource and energy intensive and accompanied by escalating volumes of solid and toxic waste. In order to minimize the potentially negative influence of technological development on human and environment, it is necessary to successfully deal with challenges such as increased energy usage, waste and greenhouse gas emissions, and the consumption of natural and non-renewable raw materials. This is the reason for moving towards a greener future, where technology, IoT and the economy will be substituted with green technology, green IoT and the green economy, respectively, what implies a whole world of potentially remarkable improvements of human well-being and hence contributes to the sustainable smart world. This chapter presents an analysis of the significance of greening technologies' processes in sustainable development, exploring the principles and roles of G-IoT in the progress of the society through the examination of its potential to improve the quality of life, environment, economic growth and green global modernization. It has been shown that the G-IoT holds the potential to transform and bring numerous benefits (among environment protection, customer satisfaction, and increased profit are the most significant) in diverse sectors using the latest technology approaches and solutions alongside eliminated or minimized the negative impact on the human health and the environment.

- 4. Mirjana Maksimovic, Vladimir Vujovic, *Internet of Things Based E-health Systems: Ideas, Expectations and Concerns*. In: S. U. Khan, A. Y. Zomaya, A. Abbas (Eds.). Handbook of Large-Scale Distributed Computing in Smart Healthcare, chapter 10: pp. 241-280; Springer International Publishing., ISBN: 978-3-319-58280-1, DOI:10.1007/978-3-319-58280-1, 2017**

Even the interaction between technology and healthcare has a long history, the embracing of e-health is slow because of limited infrastructural arrangements, capacity and political willingness. Internet of Things (IoT) is expected to usher in the biggest and fastest spread of technology in history, therefore together with e-health will completely modify person-to-person, humanto-machine and machine-to-machine (M2M) communications for the benefit of society in general. It is anticipated that the IoT-based e-health solutions will revolutionize the healthcare industry like nothing else before it. The rapid growth of IoT, Cloud computing and Big data, as well as the proliferation and widespread adoption of new technologies and miniature sensing device, have brought forth new opportunities to change the way patients and their healthcare providers manage health conditions, thus improving human health and well-being. The integration of IoT into the healthcare system brings numerous advantages, such as the availability and accessibility, the ability to provide a more "personalized" system, and high quality cost-effective healthcare delivery. Still, the success of the IoT-based e-health systems will depend on barriers needed to overcome in order to achieve large-scale adoption of e-health applications. A large number of significant technological improvements in both hardware and software components are required to develop consistent, safe, effective, timely, flexible, patient-centered, power-efficient and ubiquitous healthcare systems. However, trust, privacy and security concerns, as well as regulation issues, identification, and semantic interoperability are pivotal in the widespread adoption of IoT and e-health together. Therefore, developing a climate of trust is one of the most important tasks that must be accomplished for successful e-health implementations. This chapter analyzes the ideas and impacts of IoT on the design of new e-health solutions and identifies the majority of challenges that determine successful IoT-based e-health system adoption.

б) Рад у часопису међународног значаја

- 1. Mirjana Maksimovic, *Leveraging Internet of Things to Revolutionize Waste Management*. International Journal of Agricultural and Environmental Information Systems, 9(4):1-13., DOI:10.4018/IJAEIS.2018100101, 2018**

A continuously growing population and their migration to urban centers consequently leads to waste expansion. The rapidly increasing quantities of waste generated in the cities affect way of human life, environment and planet. Hence, the necessity for smarter, safer, and greener places have never been more urgent. The novel technologies, Internet of Things (IoT) particularly, holds the potential to better manage waste and recycling. The IoT-driven waste management systems positively influence achieving the vision of smart green cities. This article analyzes the role of smart and safe IoT-powered waste management system, highlights its benefits, and possibilities of implementation and evaluation. It is expected that the IoT-based waste management system will deal successfully with an increasing amount of diverse types of waste and through the realization of a smart green city vision will resolve numerous problems related to human health and environmental contamination.

2. Gurbeta Lejla, Almir Badnjevic, **Mirjana Maksimovic**, Enisa Omanovic-Miklicanin, Ervin Sejdic, *A telehealth system for automated diagnosis of asthma and chronic obstructive pulmonary disease*. Journal of the American Medical Informatics Association, 25(9):1213–1217., DOI:10.1093/jamia/ocy055, **2018 (импакт фактор: 4.29)**

This paper presents the development and real-time testing of an automated expert diagnostic telehealth system for the diagnosis of 2 respiratory diseases, asthma and Chronic Obstructive Pulmonary Disease (COPD). The system utilizes Android, Java, MATLAB, and PHP technologies and consists of a spirometer, mobile application, and expert diagnostic system. To evaluate the effectiveness of the system, a prospective study was carried out in 3 remote primary healthcare institutions, and one hospital in Bosnia and Herzegovina healthcare system. During 6 months, 780 patients were assessed and diagnosed with an accuracy of 97.32%. The presented approach is simple to use and offers specialized consultations for patients in remote, rural, and isolated communities, as well as old and less physically mobile patients. While improving the quality of care delivered to patients, it was also found to be very beneficial in terms of healthcare.

3. **Mirjana Maksimović**, *IoT Concept Application in Educational Sector Using Collaboration*. FACTA UNIVERSITATIS, Series: Teaching, Learning and Teacher Education Vol. 1, No 2, pp. 137 – 150, DOI:10.22190/FUTLTE1702137M, **2017**

Since its appearance, the Internet of Things (IoT) shows the potential to radically transform numerous areas of our everyday lives. Education, as one of the most important concerns and investments of a new world, didn't remain immune to novel technology advancements. With the IoT vision, not just computers, tablets and smartphones, but almost every other device becomes connected to the Internet, completely changing the traditional model of education. This paper analyzes manners to achieving enhanced educational practices using novel Information and Communication Technologies (ICTs), particularly IoT, as well as the potential of these approaches to contribute in achieving economically, socially and environmentally sustainable educational environment. Alongside technology, enhanced IoT-supported educational environment demands a higher degree of collaboration among institutions, staff members, and students. Only with full engagement of all stakeholders and their willingness to cooperate and collaborate, the idea of the completely redesigned education sector, technology supported, enhanced and economically, ecologically and socio-culturally sustainable is possible. Therefore, the power of collaboration, people, and technology in the modernization of the education sector and the realizing fully IoT-supported collaborative educational practices and the environment is the subject of discussion.

4. **Mirjana Maksimović**, *The roles of Nanotechnology and Internet of Nano things in healthcare transformation*. TechnoLogicas, 20(40):139-153., DOI:10.22430/22565337.720, **2017**

Healthcare, as a basic human right, did not remain immune to innovative technologies. Technological progress has significantly contributed to high-quality, on-time, acceptable and affordable healthcare. Since their appearance, nanotechnology and the Internet of Nano Things (IoNT) have continuously affected healthcare and have a tremendous influence on its transformation, contributing to the better outcome. The inclusion of nanotechnology in medicine through nanomaterials and nanodevices, known as nanomedicine, has brought numerous benefits in disease prevention, diagnosis, and treatment. Going further by connecting nanodevices to the Internet, the IoNT paradigm has been created. The inclusion of IoNT concepts in healthcare has resulted in more personalized, timely, and convenient health monitoring and treatment. Hence, nanotechnology and the IoNT hold the potential to completely revolutionize healthcare in the 21st Century, creating a system that will enable early disease detection and diagnosis followed by accurate, on-time and effective treatment with significantly reduced healthcare costs. This paper presents the roles of nanotechnology and IoNT in medicine and healthcare, and attempts to gain an insight of nanoscale solutions and approaches, highlighting benefits and discussing potential risks and concerns. Despite concerns regarding nanotoxicity, privacy and security issues, it is anticipated that nanotechnology and IoNT will show their full potential in medicine and healthcare in the years to come.

5. **Mirjana Maksimovic**, *The Role of Green Internet of Things (G-IoT) and Big Data in Making Cities Smarter, Safer and More Sustainable*. International Journal of Computing and Digital Systems, 6(4):2210-142., DOI:10.12785/ijcds/060403, **2017**

The world population growth and increased demands for limited goods consequently imply the necessity for more efficient use of materials and resources. As the novel advances in Information and

Communication Technology (ICT) have totally revolutionized the numerous areas, their utilization at the same time possesses a negative influence on the human health and the environment. For that reason, the society is going toward the greener future where the usage of raw and non-renewable materials and resources will be reduced while energy consumption and pollution will be decreased. As ICT can be considered as a tool for addressing environmental problems, Green Internet of Things (G-IoT) takes one of the most important roles on the way to create a green and sustainable place for living. Big data analysis is essential in achieving valuable insights from voluminous and various G-IoT generated data. The obtained knowledge enables easier decision-making, forecasting and other activities regarding smart city services, and in return contributes to a continuous improvement of G-IoT technologies. Hence, even the vision of smart and sustainable cities has already become a reality, the G-IoT approaches and insights achieved from Big data analysis will make cities significantly smarter, safer and more sustainable. This paper tries to summarize the role of novel technology advancements and Big data' achievements in the process of creating cities where the quality of life will be enhanced alongside reduced pollution and more efficient utilization of goods. It has been shown that G-IoT and Big data operating symbiotically successfully contribute to the fruition of smart and sustainable city vision.

- 6. Mirjana Maksimović, Vladimir Vujović, Branko Perišić, *Do It Yourself solution of Internet of Things Healthcare System: Measuring body parameters and environmental parameters affecting health.* Journal of Information Systems Engineering & Management 1(1):25-39., DOI:10.20897/lectito.201607, 2016**

The rapid advancements in information and communications technologies (ICT) and the increasing number of smart things shift an old-fashioned healthcare system to a model better suited for a population of the 21st century. New healthcare approaches based on Internet of Things (IoT)/Internet of Medical Things (IoMT) powered systems make health monitoring, diagnostics and treatment more personalized, timely and convenient, enabling a global approach to the healthcare system infrastructure development. Commercial systems in this area exist in various forms but usually do not fit the general patient needs, and those that do are usually economically unacceptable due to the high operational and development costs. Do It Yourself (DIY) healthcare, including mobile applications and consumer medical devices, nowadays is the top healthcare trend. Therefore, this paper, based on well-known low-cost technologies, presents a DIY IoMT solution for observing human vital parameter as well as environmental factors affecting health.

- 7. Mirjana Maksimović, Vladimir Vujović, Enisa Omanović-Miklićanin, *Application of Internet of Things in food packaging and transportation.* Int. J. Sustainable Agricultural Management and Informatics, Vol. 1, No. 4, pp. 333–350, DOI:10.1504/IJSAMI.2015.075053, 2015**

Food safety is a scientific field which includes a number of routines and inspections at every stage of the food chain that should be adopted to avoid potentially dangerous health risks. Novel and efficient solutions across the supply chain are the consequence of constant upgrades of information and communication technologies. With the help of internet of things (IoT) connected testing equipment, food quality can be monitored at any point from farm to table, connecting at the same time food producers, transportation and hospitality/retail companies. Relying on the fact that food transporting and packaging units are the most critical points in food production, the survey of IoT applications in food packaging and transportation is given in this paper. To demonstrate the significance of IoT appliance and defined concepts, a proposal of low cost solution based on IoT for real-time food traceability and monitoring in food transportation process is presented.

- 8. Vladimir Vujovic, Mirjana Maksimovic, *Raspberry Pi as a Sensor Web node for home automation.* Computers & Electrical Engineering, Vol. 44, pp. 153-171, DOI:10.1016/j.compeleceng.2015.01.019, 2015 (импакт фактор: 2.18)**

The world of home automation is an exciting field that has exploded with new technologies and today is known as an area where “The internet of things” (IoT) vision becomes reality. The primary advantages that stem from this concept include how each device forms a small part of the Internet, by which the advanced system is able to interact and communicate, maximizes safety, security, comfort, convenience and energy-savings. This paper proposes an implementation of Sensor Web node as a part of IoT using a Raspberry Pi – inexpensive, fully customizable and programmable small computer with support for a large number of peripherals and network communication. Using this technology, in an example of monitoring and determining the confidence of fire in building, a full system, based on Sensor Web elements, is created and developed starting from a scratch. The given example confirms the advantage of

в) Рад у часопису националног значаја

1. Zvezdana Gavrilović, **Mirjana Maksimović**, *Green Innovations in the Tourism Sector. STRATEGIC MANAGEMENT*, Vol. 23, No. 1, pp. 036-042, DOI:10.5937/StraMan1801036G, **2018**

Knowing that the tourism sector is able to generate significant social, economic and cultural benefits and development, looking for novel ways to improve this sector is more than justified. The tourism industry has not been immune to evolving advancements in Information and Communication Technologies (ICTs). Novel technology solutions and approaches have potential to significantly revolutionize this sector, making the vision of smart tourism omnipresent. Going further by investing in the greening of the tourism sector, sustainable, smart and green tourism will soon become reality. Protected environment and preserved cultural heritage and natural assets through the reduced usage of energy and reduced hazardous pollutants will consequently lead to economically, socially and environmentally sustainable tourism sector. These three components, green building, green energy and green waste are at the same time parts of the green management concept. Hence, to realize a vision of successful green tourism, it is essential to perform adequate green management implementations, including certain marketing efforts, namely green marketing. This paper presents an analysis of various greening processes of tourism sector with the help of ICTs and highlights the importance of green management and green marketing in achieving smart, green and sustainable tourism sector.

2. Zvezdana Gavrilović, **Mirjana Maksimović**, *The ICT and Database marketing: Synergy effects for business success*. Novi Ekonomist: Journal of Economic Theory and Practice, Vol 11, N° 22, **2017**

Companies owning consumer databases provide successful performance on the market whose effects are measured by achievements of objectives of sales and profit. Collection and use of consumer data enable better determination of the target markets and understanding of consumer behavior. Field of computerized segmentation and defining target markets is extremely sophisticated and essential for Direct Marketing so that those who apply it consider it as a new marketing, namely Database Marketing. The modern definition of Database Marketing indicates that it is a form of Direct Marketing using databases of both current and potential customers applying new and advanced approaches. In other words, today's technology advancements enable efficient use of the database to collect, consolidate, analyze, understand and manage customer data in order to deliver relevant and personalized marketing messages to the right place at the right time. The Internet is a great medium for the further development of Database Marketing that through the creation of an electronic database facilitates the monitoring of companies' promotional effects. Therefore, this paper analyzes the influence of novel Information and Communication Technologies (ICTs) to the development of Database Marketing as well as Database Marketing significance and influence to business success.

3. **Mirjana Maksimović**, *Implementation of Fog computing in IoT-based healthcare system*. Journal of Information Technology and Applications - JITA 7(2017) 2:100-107, DOI:10.7251/JIT1702100M, **2017**

Nowhere do the technology advancements bring improvements than in the healthcare sector, constantly creating new healthcare applications and systems which completely revolutionize the healthcare domain. The appearance of Internet of Things (IoT) based healthcare systems has immensely improved quality and delivery of care, and significantly reduced the costs. At the same time, these systems generate the enormous amount of health-associated data which has to be properly gathered, analyzed and shared. The smart devices, as the components of IoT-driven healthcare systems, are not able to deal with IoT-produced data, neither data posting to the Cloud is the appropriate solution. To overcome smart devices' and Cloud's limitations the new paradigm, known as Fog computing, has appeared, where an additional layer processes the data and sends the results to the Cloud. Despite numerous benefits Fog computing brings into IoT-based environments, the privacy and security issues remain the main challenge for its implementation. The reasons for integrating the IoT-based healthcare system and Fog computing, benefits and challenges, as well as the proposition of simple low-cost system are presented in this paper.

4. Enisa Omanovic-Miklicanin, **Mirjana Maksimovic**, *Nanosensors applications in agriculture and food industry*. Bulletin of the Chemists and Technologists of Bosnia and Herzegovina.

Food safety is very important issue in food industry and agriculture because it is directly related to the influence of food on the human health. Recent food safety incidents (such as the melamine affair in 2007 and 2008) and public health concerns about synthetic food additives and chemical residues in food have driven the need to develop rapid, sensitive, and reliable methods to detect those food hazards. An alternative is given in the rapid development of nanosensors which have advantage to detect food components in an easy and quick manner. Linking nanosensors with modern Information and Communication Technologies (ICTs) enables novel and online ways for different components detection accompanied with high accuracy. Various types of nanosensors are being developed to meet the different requirements in food inspection (nanosensors for detection of external and internal conditions in food packaging, carbon nanotubes based electrochemical sensors for detection of cations, anions and organic compounds in food, various aptamers for detection of pesticides, antibiotics, heavy metals, microbial cells and toxins). The work reviews development and application of the most present nanosensors in agriculture and food industry.

5. Звјездана Гавриловић, **Мирјана Максимовић**, Борка Поповић, *Утицај Интернета ствари на развој дигиталне економије*, Нови Економист, стр. 97-102, 2016

Глобална економија, снажна конкуренција, мијењање природе радне снаге и софистицираност потрошача утицали су на потребу да се традиционална економија трансформише у дигиталну економију. Дигитална економија се односи на економију која је заснована на дигиталним технологијама, укључујући дигиталне комуникационе мреже, рачунаре, софтвер и друге повезане информационе технологије. Нова димензија уведена у свијет информационих и комуникационих технологија, позната као Интернет ствари, заснована је на идеји на основу које ће ствари у било ком тренутку, на било ком мјесту и за било кога, бити доступни и увезани у јединствен систем, стварајући на тај начин нове могућности и изазове за разне домене апликација. Повезујући паметне уређаје, конвенционалне потрошачке елементе и физичко власништво преко Интернета, Интернет ствари брише границе између Интернет технологија и производа који се не сврставају у ту категорију и тиме остварује значајне социолошке, технолошке и економске бенефиције. Стога је данас незамисливо планирати процес трансформације организација и истраживати тржишне промјене у дигиталној економији без анализирања концепта Интернета ствари.

6. **Mirjana Maksimovic**, Vladimir Milosevic, *Evaluating the optimal sensor placement for smoke detection*. Yugoslav journal of operations research. 26, Number 1, pp. 33-50 DOI: 10.2298/YJOR140312002M, 2016

Wireless Sensor Networks (WSNs) consist of wireless sensor nodes, where the choice of their deployment scheme depends highly on the type of sensors, their application, and the environment they will operate in. The performance of WSNs can be affected if the network is deployed under different topologies. In this paper various strategies for positioning nodes in WSNs for fire detection (grid, triangular and strip) are discussed. We propose the proper placement of the smoke sensors to satisfy two important network design objectives: to maximize the network lifetime after fire ignition, and to achieve full coverage by using a minimum number of sensors (especially in a deterministic node deployment).

7. Владимир Вујовић, **Мирјана Максимовић**, *Савремени технолошки приступ у процесу праћења и контроле хране*. Гласник Института за стандардизацију Босне и Херцеговине, Вол. IX, Бр. 1-2, стр. 36-41, 2015

Савремене технологије и процеси глобализације отварају нове могућности у производњи, преради и дистрибуцији хране, али упоредо с тим расту и бројни и разноврсни ризици. Посједовање што потпунијих информација о прехранбеном производу, те сигурност, квалитет и здравствена исправност хране су главни циљ свих учесника у прехранбеном ланцу. С технолошким напретком омогућава се осавремењивање постојећих и креирање нових система сљедивости хране, чиме се поспјешује транспарентност процеса производње, дистрибуције и потрошње, а самим тим и повјерења потрошача према произвођачима.

8. Enisa Omanović-Miklićanin, **Mirjana Maksimović**, Vladimir Vujović, *The Future of Healthcare: Nanomedicine and Internet of Nano Things*. 1st Conference on Medical and Biological Engineering in Bosnia and Herzegovina, Folia Med. Fac. Med. Univ. Sarajevisis, 50(1): 23-28, 2015

Constant population growth influences of health care demands and needs for new, more advanced scientific solutions. Classical way of providing the health care services could be very robust. It requires new paradigm and technology for more effective solutions. Rapid development information and nano technologies change the health care system in total. It gives to the health care system a new, global domain – Internet of Nano Things (IoNT) and nanomedicine. These two concepts are beginning to change the foundations of disease diagnosis, treatment, and prevention. Future healthcare based on IoNT powered e-health systems will make health monitoring, diagnostics and treatment more personalized, timely and convenient. These improvements increase the availability and quality of medical care followed with radically reduced costs. Thus, analysis of this approach is highly important for future development of healthcare.

г) Рад саопштен на скупу националног и међународног значаја штампан у целини

1. Miodrag Forcan, **Mirjana Maksimović**, Jovana Forcan, *Cloud-based approach for real-time monitoring of Smart Grid topology*. 5th Jubilee Virtual International Conference on Science, Technology and Management in Energy - eNergetics **2019**

This article is focused on the development of a real-time communication system for monitoring of Smart Grid (SG) topology using Cloud-based approach. Network topology processors are an integral part of the transmission network's state estimation and power flow analysis functions. Tracking of SG topology in real-time could be achieved using available local measurements from smart devices and Cloud-based control center, communicating with each other through the internet. Well-known IEEE test grid topology is modeled using MATLAB/Simulink software package and modified to support real-time communication with open source IoT platform ThingSpeak. As a result an interesting and novel model is proposed combining SG and Cloud-based communication system. Several simulation case studies, related to network reconfigurations, are defined to test the developed model. Obtained simulation results show all capabilities and benefits of the proposed Cloud-based monitoring approach.

2. **Mirjana Maksimović**, Zvezdana Gavrilović, *The symbiosis of modern ICTs and marketing strategies in agriculture*. X International Agriculture Symposium "AGROSYM 2019", Jahorina, Bosnia and Herzegovina, **2019**

Demands for quantity, quality and diversity of food products have never been higher. Satisfying consumers' fast-changing demands and high expectation regarding food-related products is a big challenge for food producers and agriculture industry. Response to this challenge can be seen in smart and sustainable agriculture. Novel Information and Communication Technologies (ICTs) have brought immense improvements in a wide scope of domains and agriculture didn't remain immune to the progress of modern technologies. The increased production and enhanced farming practices with the reduced negative influence on the environment and sustainable utilization of resources are some of the characteristics of agri-food industry of the 21st Century. However, the overall success of the agri-food sector is not possible without adequate marketing practices that will make a strong bond between food producers and consumers. The purpose of the paper is to examine the role and opportunities of ICTs use in agricultural marketing, and the significance of effective agricultural marketing in business development. The particular attention has been devoted to the digital marketing strategies applicable in agriculture and the benefits they bring. The presented research shows that the symbiosis of modern ICTs and marketing strategies in agriculture transformation will increase the satisfaction and loyalty of current customers, gain more customers, and boost sales and profits.

3. **Мирјана Максимовић**, Звјездана Гавриловић, *Маркетинг изазови у ери дигиталне трансформације*, Финрар - 14. Међународни симпозијум о корпоративном управљању, Бања Врућица – Теслић, ISBN 9789995583286 , стр. 453-464, **2019**

Дигиталном трансформацијом врши се инкорпорирање дигиталне технологије у пословне процесе предузећа мењајући њихов досадашњи начин пословања. Индустија 4.0 мења све сегменте пословања, без обзира да ли се ради о производним или услужним предузећима. Промењен је начин повезивања људи, података, али и процес испоручивања вредности крајњим потрошачима, а све са намером да се одржи конкурентна предност у дигиталној ери пословања. У ери дигиталне трансформације потребе предузећа се разликују, али сваком предузећу је неопходно да примени неке од основних видова дигиталних технологија попут: Интернета

ствари, рачунарства у облаку, вештачке интелигенције, техника машинског учења, дубинске анализе података, пословне интелигенције, планирања ресурса у корпорацијама, управљања односима са клијентима, виртуелне реалности и измењене стварности. Дигитална трансформација директно утиче на маркетинг и продају, јер се мења и начин интеракције са клијентима и купцима. Предуслов за успешно пословање јесте задовољан корисник, а у дигиталном окружењу, захваљујући технологији могуће је формирати адекватне бизнис моделе који би обезбедили њихову сатисфакцију. Циљ овог рада јесте да представи изазове са којима се сусреће маркетинг у ери дигиталне трансформације, као и да предложи најбоља решења за савладавање тих изазова.

4. **Mirjana Maksimovic**, Marijana Cosovic, *Preservation of Cultural Heritage Sites using IoT*, 18th International Symposium INFOTEH-JAHORINA, pp.1-4, **2019**

Religious/historical buildings ought to be preserved for as long as possible. The ancient structures themselves and the rich collections they store represent irreplaceable wealth for future generations. They also provide the space for the customs and traditions to sustain. In addition, cultural heritage sites can stimulate economic growth but need to be maintained as well. This paper proposes an effective and affordable solution for the monitoring of preservation conditions of the Church belonging to Eastern Orthodox cultural heritage. The solution is based on utilization of modern Information and Communication Technologies (ICT) and services with general structure and main design principles using the three-layer IoT architecture. This research is an ongoing work only involving the first step towards realization of preservation monitoring system.

5. Zvezdana Gavrilovic, **Mirjana Maksimovic**, *New digital marketing dimension through the Internet of Things*, 24th International Scientific Symposium Strategic Management and Decision Support Systems in Strategic Management, Subotica, Serbia, pp. 387-393, **2019**

Internet of Things (IoT), as an ecosystem of a variety of smart devices that enable data exchange over the Internet, provides a dynamic transformation of all industries and businesses, especially in information-related sectors, such as digital marketing. It is expected that by 2020, there will be over 50 billion IoT devices in homes and enterprises around the globe. Through the IoT enormous amount of data has been collected, allowing the establishment of new digital media strategies, and influencing marketers to incorporate the changes that technology brings to the digital marketing industry. With the increase in the number of IoT devices, marketers will be able to monitor and analyze consumer behavior, react to them almost immediately and, in accordance with this, better predict the behavior of consumers. The development of IoT and new data mining technologies facilitate the process of data collection, avoiding complicated market analysis processes. In addition, individual communication with each consumer is now enabled and thanks to these benefits, IoT becomes key support to marketers in meeting customer needs and requirements. It is anticipated that greater use of IoT devices will affect all segments of digital marketing, such as content marketing, the establishment of a digital promotional budget, and search strategies among others, but will also affect the form of advertising in the future. The appliance of IoT vision will make the organization more productive and efficient, by improving its products and services to provide a higher level of customer satisfaction. Nevertheless, in order to take advantage of the IoT benefits, organizations must redesign their existing business processes.

6. Enisa Omanovic-Miklicanin, **Mirjana Maksimovic**, *Application of Nanotechnology in Agriculture and Food Production – Nanofood and Nanoagriculture*. 5th International Conference on Electrical, Electronic and Computing Engineering, IcETRAN, pp. 961-966, Palic, Serbia, **2018**

Nanotechnology presents one of the exciting new fields of research that holds potential to address many of the pressing needs in all areas of the food and agriculture. Numerous and diverse characteristics and combinations of nanotechnologies may be applied in various fields of food sciences - from plant cropping and animal feeding to food production, manufacturing and packaging – therefore contributing to safe and quality food products. Methods based on nanotechnology present very powerful alternative to the existing methods for identification and quantification of contaminants and other ingredients in food, improving production and enhancing food safety through the development of nano-based detection systems. Additionally, in the evaluation of food quality and safety (nano)spectroscopic methods are very important due to rapid and non-destructive analytical performances. The symbiotic approach of nanotechnology and novel information and communication technology (ICT) has created a paradigm, namely Internet of Things (IoNT) that holds potential to bring numerous benefits in agri-food sector.

Therefore, this work identifies nanotechnology and IoNT which are poised to revolutionize agriculture in the 21st century. It evaluates the most important applications of nanotechnology, nanospectroscopy and IoNT applications in agriculture and food sciences up-to-date.

- 7. Mirjana Maksimović, *The role of Osmotic computing in Internet of Things*. 17th International Symposium INFOTEH-JAHORINA, Jahorina, East Sarajevo, Bosnia and Herzegovina, DOI:10.1109/INFOTEH.2018.8345538, 2018**

The evolution of the Internet of Things (IoT) considerably increases number, type and range of smart Internet-enabled devices that provide the connection of anyone, anywhere, anyhow, and anytime, therefore revolutionizing almost every aspect of our lives (e.g., education, healthcare, industry, transport, agriculture, etc.). The Internet-aware devices produce rapidly increased IoT data volumes what implies necessity for efficient execution of IoT data management tasks. Alongside well-known concepts of Cloud, Fog and Edge computing, a term Osmotic computing appears as a support for efficient execution of IoT services and applications across different computing infrastructures. This paper introduces basic principles of Osmotic computing and analyzes its significance in the IoT vision. Therefore, the main benefits as well as challenges for the Osmotic computing utilization in IoT have been discussed.

- 8. Mirjana Maksimović, *Internet of Things driven waste management system for greener city*. 18th Hellenic Forestry Congress «Hellenic Forestry facing major challenges: sustainable forest management, forest cadaster, environmental technologies-networking and nature protection» & International Workshop “Information Technology, Sustainable Development, Scientific Network & Nature Protection”, Edessa, Greece, 2017**

With a rising number of people and their mitigation to urban centers, the expansion of waste and its harmful effects on human health and environment have never been more noticeable. At the same time demand for smarter, safer and greener places to live constantly increases. The Internet of Things (IoT) progress shows a positive influence on achieving the vision of smart and sustainable cities, particularly through the development and evolution of IoT-driven waste management systems. This paper suggests the work schedule of an IoT-based smart waste management system, discusses its benefits and possibilities for the evolution and implementation of smart systems that will enable safe, and efficient waste management. It is expected that the IoT-powered waste management system will deal successfully with a massive volume of diverse types of waste and consequently solves many problems related to human health and environmental pollution.

- 9. Mirjana Maksimović, Enisa Omanović-Miklićanin, *Green Internet of Things and green nanotechnology role in realizing smart and sustainable agriculture*, VIII International Scientific Agriculture Symposium "AGROSYM 2017", pp. 2290-2295, Jahorina, Bosnia and Herzegovina, 2017**

The application of Information and Communication Technology (ICT) advances in agriculture has completely revolutionized this sector. Unfortunately, alongside numerous advantages such as increased agriculture productivity and profit, the ICT has many disadvantages. ICT can harm the land, biodiversity and water sources and it can generate significant amounts of greenhouse gas (GHG) emissions. Therefore, the current research is being focused on finding novel approaches which will increase productivity in the agriculture sector with no or minimum impact on the environment and human health. Novel technological approaches, Green Internet of Things (G-IoT) and Green nanotechnology appear as the adequate solutions to create smart and sustainable agriculture and food industry. Production automation, precision farming, remote monitoring, traceability, decision making and forecasting, promise to completely transform agriculture and the food supply chain. Green nanotechnology brings more efficient use of agrochemicals and more advanced food production processes. More productive, sustainable and precise agriculture practices and enhanced food production will lead to increased productivity and profit while at the same time the usage of raw and non-renewable resources will be reduced. This will be accompanied by decreased pollution and emissions what will lead to the realization of smart and sustainable agriculture. Hence, this paper represents an analysis of G-IoT and Green nanotechnology concepts and their role in revolutionizing agriculture sector accompanied with eliminated or minimized negative influence on human health and environment. The realization of smart and sustainable agriculture will substantially provide significant economic and social benefits.

- 10. Mirjana Maksimović, *Improving computing issues in Internet of Things driven e-health***

systems. ICYRIME 2017: International Conference for Young Researchers in Informatics, Mathematics and Engineering, Kaunas, Lithuania, Vol-1852, pp. 14-17, **2017**

The Internet of Things (IoT) progress shows a positive influence on all aspects of healthcare. Enabling access to high-quality healthcare to anyone, from anywhere are the main advantages of the IoT-driven e-health systems. Increasing numbers of medical devices and sensors and 24/7 monitoring of health parameters, consequently lead to enormous quantities and varieties of data. Having in mind the amounts of generated data and importance of on-time diagnosis and decision making as well as a significance of fast reactions in a case of detected abnormalities, transmitting all data to the Cloud for analysis may not be appropriate. For that reason, implementing a Fog computing, which realizes mini analytic processing centers at the edge of the network, appears as a better approach. This paper analyzes the manners and benefits of implementing Fog computing in the IoT-driven e-health systems. It is expected that the IoT and Fog computing together will revolutionize healthcare like nothing else before.

- 11. Mirjana Maksimović, *Necessity of the Internet of Things and Fog Computing Integration*. International scientific conference on information technology and data related research "SINTEZA", DOI:10.15308/Sinteza-2017-176-181, Belgrade, Serbia, **2017****

The Internet of Things (IoT), as a network of interconnected devices, has exploded over the past few years generating more data than ever before. At the same time, high-dimensional, high-velocity and high-variety data put an enormous burden on the Internet infrastructure. Sending a large amount of data generated by IoT to the Cloud implies problems with bandwidth, a considerable amount of time, and latency issues. Hence, utilization of Cloud computing is not adequate in applications that require very low and predictable latency, fast mobile applications, applications in a wide geographic area or large-scale distributed control systems. In these cases, Fog computing, by creating an additional computing layer between devices and Cloud, enables the computation execution at the place where data is generated. Without the need for the Cloud, Fog computing holds the potential to overcome barriers that Cloud computing utilization in particular cases implies. However, Fog computing will not completely replace the Cloud computing. Instead, Fog and Cloud computing together will lead to numerous benefits in the IoT applications. This paper analyzes ideas and influence of the Fog computing appliance in various IoT scenarios, as well as benefits, potentials, and challenges of Fog computing implementations.

- 12. Mirjana Maksimović, *Green Internet of Things (G-IoT) at engineering education institution: the classroom of tomorrow*. INFOTEH-JAHORINA 2017, Vol. 16, pp. 270-273, Jahorina, Bosnia and Herzegovina, **2017****

Education, as almost every other aspect of our lives, has not been immune to advancements in Information and Communication Technology (ICT). With the evolution of the Internet of Things (IoT), the vision of completely smart classroom has never been closer to reality. However, despite diverse benefits of novel technology solutions, manufacturing, distribution, and utilization of IoT products and systems are energy and resource intensive and accompanied by escalating volumes of waste and toxic pollutions. Hence, in order to maximize benefits and minimize harm to people and the environment, Green IoT (G-IoT) appears as the adequate solution. This paper analyzes the possibilities of the G-IoT utilization in the engineering education. Therefore, the main benefits, as well as challenges for the appliance of G-IoT vision in a smart classroom, have been discussed.

- 13. Mirjana Maksimović, Enisa Omanović-Miklićanin, *Towards green nanotechnology: maximizing benefits and minimizing harm*. International Conference on Medical and Biological Engineering - CMBEBIH, pp. 164-170; DOI:10.1007/978-981-10-4166-2_26, **2017****

The ultimate goal of any economic, technological and social development is to improve human health and well-being. Thus, the society brings new requirements to new technologies, moving towards clean and green technology development. Green nanotechnology, as a branch of green technology, significantly contributes to environmental sustainability by producing nanomaterials and nanoproducts without harming human health and the environment, and by producing nanoproducts that provide solutions to environmental problems as well. Green nanotechnology is based on the existing principles of green chemistry and green engineering – it uses less materials and renewable inputs wherever possible, and thereby saving energy and fuel. The main benefits of green nanotechnology are: increased energy efficiency, reduced waste and greenhouse gas emissions, and minimized the consumption of non-renewable raw materials.

- 14. Borka Popović, Mirjana Maksimović, *E-health in Bosnia and Herzegovina: exploring the***

challenges of widespread adoption. International Conference on Medical and Biological Engineering - CMBEBIH, pp. 388-395, DOI:10.1007/978-981-10-4166-2_60, **2017**

The rapid advancements in Information and Communications Technologies (ICTs) and the increasing number of smart things (portable devices and sensors) enable the transfer of health resources and healthcare by electronic means. This is known as ehealth, and today is closely related to the Internet, which provides a new medium for dissemination of healthcare-related information and for interaction and collaboration among institutions, health professionals, health providers and the public. Increased efficiency in healthcare, improved quality of care, availability, responsibility and satisfaction of patients and consumers are the main benefits ehealth offers. Unfortunately, there are many challenges associated with e-health adoption, especially in developing countries like Bosnia and Herzegovina. To understand and address the challenges of implementing and adopting e-health in Bosnia and Herzegovina, this paper presents a review which identifies the main political, economic and technological challenges for widespread e-health adoption.

- 15. Mirjana Maksimović**, *Transforming educational environment through Green Internet of Things (G-IoT)*. 23. Naučno-stručni skup trendovi razvoja – TREND 2017, Paper No. T1.1-3, pp. 1-4, Zlatibor, Serbia, **2017**

Despite the numerous benefits Information and Communication Technology (ICT) brings in education, it should be remembered that the ICT utilization is energy and resource intensive, embraced with escalating volumes of electronic waste (e-waste) and toxic pollution. To minimize harm and maximize benefits of the ICT usage in educational environments, moving towards green ICT, which is health and environment aware, appears as the key solution. Having in mind the significance of the Internet of Things (IoT) in education, applying the green version (G-IoT) should bring much more benefits. It is anticipated that the education and learning environments of tomorrow will be, not just better and high-quality, but also economically, socially and environmentally sustainable and that G-IoT will play a significant role in achieving this goal. Therefore, this paper presents the ideas and concepts of G-IoT and highlights the potential benefits G-IoT offers at educational institutions.

- 16. Mirjana Maksimovic**, Zvezdana Gavrilovic, *Connecting sciences in green: Internet of Things and economy*. ENTECH '16/IV. International Energy Technologies Conference, pp. 173-182, Istanbul, Turkey, **2016**

The recent progresses in Information and Communication Technology (ICT) sector pave the way for the realization of the Internet of Things (IoT) which fuels innovation in every area of science, technology and human life in general. Interconnecting people and things anytime, at any place, with anything and anyone, ideally using any path/network and any service implies radical transformations of human activities as well as significant changes in businesses and society. Although the benefits of ICT are enormous, its rapid growth influences more e-waste and greenhouse emissions. Therefore, in order to have a sustainable place for living, it is necessary to put a lot of efforts to reduce toxic pollutions by reducing carbon production and the energy consumption. This is the reason for moving towards Green IoT (G-IoT), where computing devices, communications protocols, and networking architectures are energy efficient alongside reduced carbon emissions and pollutions, what implies a whole world of potentially remarkable improvements of human well-being and growing the world's economy. In other words, smart systems and G-IoT are key technological enablers of the green economy, which can be defined as one of the results of improved quality of life and social equity accompanied with preserved and enhanced environmental quality. Therefore, businesses nowadays have prioritized the adoption of socially responsible strategies to ensure competitive advantage and sustainable development. Implementation of these strategies contributes to strengthening the image and credibility of the companies and it will increase the number of consumers and profits by selling green products. Corporate social responsibility, as a basic concept of the green economy, deals with the marketing behavior which, along with the achievement of marketing objectives, also strives to protect the interests of society and the environment as well. As the world becomes more environmentally aware through producing products and services which do not harm the environment, minimizing pollution, and emissions and conserving natural resources, alongside reduced energy consumption, the green economy is expected to contribute to sustainable growth of society. Thus, the green economy requires the cooperation of all business functions in order to find the best possible solutions that have two main objectives: profit and long-term positive contribution to the environment. This implies a need to engage companies and the general public for IoT innovations, to develop green and sustainable products and services and explore opportunities for G-IoT business worldwide. Hence, this paper presents the review of advancements in

G-IoT sector, benefits and concerns, and its influence on the green economy as well.

- 17. Enisa Omanovic-Miklicanin, Mirjana Maksimovic, Ivana Vinkovic-Vrcek, Dzana Mulaomerovic, Amra Doric, *Application of nanotechnology in food packaging*. 5th Workshop: Specific methods for food safety and quality, pp.119-125, Belgrade, Serbia, 2016 (invited lecture)**

Rapid advancements in nanosciences and nanotechnologies in recent years are offering a variety of benefits to the whole of agro-food production chain. The main focus appears to be on food packaging and health food products. Nano-enhanced packaging has much to offer. Benefits range from stronger and more flexible films, to smart packaging which can vastly simplify stock management and monitor food condition. However, as with many burgeoning areas of nanotechnology, there are some concerns which must be raised. It is not yet completely clear to what extent nanoparticles embedded in packaging films can leach into food products, and what the effects of exposure to various nanomaterials on consumer health might be. Whilst these issues are still being explored, one thing is for sure - the next few years will bring important and fascinating developments in nanotechnology for packaging, which may well act as a model for progress across all commercial applications of nanotechnology.

- 18. Ениса Омановић-Микличанин, Мирјана Максимовић, *Наноматеријали у модерној технологији са освртом на примјену у модерној медицини*. Девета међународна научна конференција Саврмени материјали, Бања Лука, Босна и Херцеговина, 2016**

Нанотехнологија, као најнапреднија технологија данашњице, омогућава креирање двије основне врсте нанотехнолошких алата – наноматеријале (револуционарно нове материјале) и наноуређаје, који су свеprisутнији у многим областима инжењерства, информационих технологија, телекомуникација, агроиндустрије, екологије, војне и космичке индустрије, итд. Ипак, највећа примјена и достигнућа нанотехнологије у задњих десетак година примјетна су у медицини. То је довело до развоја посебне гране медицине која повезује нанотехнологију и медицину и назива се наномедицином. Наномедицина се бави дијагнозом, третманом, мониторингом и контролом биолошких система уз помоћ нанотехнологије. Све већу примјену наноматеријала, поред потенцијалних користи, прати и све већа забринутост због потенцијалних ризика које примјена истих носи са собом. У овом раду направљен је осврт на значај, предности и недостатке примјене наноматеријала у модерној технологији са нагласком на наномедицину.

- 19. Борка Поповић, Мирјана Максимовић, *Изазови за имплементацију концепта е-здравства у Босни и Херцеговини*. Трећи научни скуп Универзитета Источно Сарајево „Економија данас – слободе, конкуренције, субвенције“. стр. 524-531, ISBN 978-99976-610-3-6, 2016**

Информационо-комуникационе технологије (ИКТ), као кључни фактор развоја и напретка савременог друштва, условиле су и развој новог концепта у пружању здравствене заштите, познат као е-здравство. Е-здравствене услуге пружају бољу здравствену заштиту уз побољшану доступност, ефикасност, одговорност и задовољство пацијената. Нажалост, постоје многи изазови повезани са имплементацијом е-здравства, посебно у земљама у развоју као што је Босна и Херцеговина. Стога, овај рад представља истраживање политичких, економских и технолошких изазова који су главне препреке за потпуну имплементацију е-здравства у нашој земљи.

- 20. Vladimir Vujovic, Srdjan Jokic, Mirjana Maksimovic, *Power Efficiency analysis in Internet of Things Sensor nodes*. 2nd International Electronic Conference on Sensors and Applications; Sensors 15, DOI:10.3390/ecsa-2-D005, 2015**

Development of new technologies, particularly the Internet and Sensor Networks, creates a completely new paradigm of the Internet utilization, commonly known as “The Internet of Things (IoT)”. The IoT can be defined as a worldwide network of “smart things” enabled to interact and communicate to each other, as well as with the environment, empowering better understanding of the “real/physical world” and discovering and extracting information about objects and actions that drive that world. Sensor nodes today can be looked as smart objects and therefore they can produce significant computational power which can be used for manipulating and processing collected information. Energy and power efficiency are essential factors in the design and operation of sensor nodes and there are a number of initiatives and tendencies to improve the power efficiency in variety of areas. Relying on the fact that the choice of control algorithm and location of the computational logic may strongly influence power efficiency, in

this paper a prototype sensor node, empowered by using fuzzy logic in decision making process, is built and tested in real case environment scenario. Used fuzzy logic processing algorithm is based on predefined rules and can detect a temperature changes in order to ensure accurate and timely response in the case of fire presence. Comparative analysis of power efficiency has been done, and was carried out for best, worst and average case of timely depended temperature changes. The aim of the experiment is to show which solution is the optimal in the sense of energy consumption – implementation of computational logic on sensor node or on a remote host.

- 21. Mirjana Maksimović, Vladimir Vujović, Enisa Omanović-Miklićanin, *A Low Cost Internet of Things Solution for Traceability and Monitoring Food Safety During Transportation*, 7th International Conference on Information and Communication Technologies in Agriculture, Food and Environment (HAICTA), pp. 583–593, Kavala Greece, 2015**

In the last decade, we are faced with a dozen food crisis, which have impact on human health. EU as response to food contamination applies a set of laws and standards for food traceability through all stages of production, processing and distribution, forcing that all food and feed operators implement special traceability systems. One of the main and a crucial element of this system is food transport from manufacturer to consumer, and possibility for monitoring food quality through the transportation process. Applying new technologies, like Internet of Things (IoT), nowadays it is possible to connect food producers, transportation and hospitality/retail companies. A low cost solution based on IoT for real-time food traceability and monitoring in food transportation process is presented in this paper

- 22. Vladimir Vujovic, Mirjana Maksimovic, *Data acquisition and analysis in educational research based on Internet of Things*. 11th international conference "Interactive Systems: Problems of Human-Computer Interactions", pp. 57-62, Ulyanovsk, Russia, 2015**

Engineering and natural science today highly depends on large sets of data which are usually collected, processed and stored for later usage. In order to create a data acquisition (DAQ) system, two main questions must be answered: how to provide adequate and optimal system for data collection, and how to analyze and process large data sets. An answer can be found in applying a new concept - Internet of Things (IoT) and the well known data mining techniques which together represent a DAQ system that can be successfully implemented in educational research. Therefore, this paper proposes a DAQ system, based on low cost hardware, IoT principles and open source and freely available data mining tools, what enables its widespread usage in educational research.

- 23. Vladimir Vujovic, Mirjana Maksimovic, *The Impact of the Internet of Things on Engineering Education*. The Second International Conference on Open and Flexible Education (ICOFE), pp. 135-144, Hong Kong, 2015**

The rapid advancement of Information and Communication Technologies (ICTs) in the last decade has created a new paradigm of Internet, known as Internet of Things (IoT). This new paradigm providing anytime and anywhere access to information in novel ways and contexts, brings people, processes, data and things together in unprecedented ways. Today IoT touches every facet of our lives, opening new opportunities for growth, innovation and knowledge creation. Through interconnection of people with many things (media, photos, information, etc.) and nowadays with physical objects too (RFID, sensors, actuators, robots, etc.), the IoT application in education has the potential to drive new ways of teaching and learning and transform the experience both for students and educators. Therefore, this paper analyses the influence and application of IoT technologies on teaching system in engineering education through practical and methodological approach. The results of the research have shown that the introduction of new methods and strategies of teaching and learning may raise the quality level of the entire engineering educational process, and guarantee the delivery of long lasting knowledge and skills that are applicable to real world problems solving.

- 24. Mirjana Maksimović, Vladimir Vujović, Branko Perišić, *A custom Internet of Things healthcare system*, 10th Iberian Conference on Information Systems and Technologies – CISTI, Vol. 1, pp. 653-658, ISBN 978-898-98434-5-5, 2015, DOI:10.1109/CISTI.2015.7170415, Águeda, Portugal, 2015**

Health is the fundamental capability humans require to perceive, feel, and act effectively, and as such, it represents a primary element in the development of the individual, but also of the environment humans belongs to. That is why it is necessary to provide adequate ways and means to ensure the appropriate

healthcare delivery based on parameters monitoring and direct providing of the medical assistance. The new technologies development and implementation, especially the Internet and Wireless Sensor Networks (WSNs) commonly known as the Internet of Things (IoT), enable global approach to the health care system infrastructure development. This leads to e-health system that, in real time manner, supplies a valuable set of information relevant to all of the stakeholders (patients, medical and paramedical staff, and health insurance) regardless their current location. Commercial systems in this area usually do not meet the general patient needs, and those that do are usually economically unacceptable due to the high operational and development costs. In this paper, based on well-known low-cost technologies, there is a Do-It-Yourself (DIY) solution for a sustainable and adaptable patient oriented infrastructure development, presented.

25. Vladimir Vujovic, **Mirjana Maksimovic**, Dijana Kosmajac, Branko Perisic, *Resource: A connection between Internet of Things and Resource-Oriented Architecture*. European Conference on Smart Objects, Systems and Technologies - Smart SysTech 2015, Aachen, Germany, **2015**

The Internet of Things (IoT) appears like a new paradigm in the globalization process. The term "Things" refers to the interconnected smart elements of any kind and purpose that can be located anywhere and interact with each other according to the predefined protocol. Because of the unlimited variety of different structures and behavior, it is essential to find the way to uniformly represent and implement the IoT in the real world environment. Referring the good practice of distributed Internet systems, like service oriented architecture (SOA), an implementation of IoT as a resource, that appears like the "black box" from the users' point of view, looks promising. The analysis of service oriented architecture and IoT, and subsequently, the selection between SOAP (Simple Object Access Protocol) and REST (Representational State Transfer) implementation style are presented in this paper. Because the main building element of REST services is a resource, REST appears as a "natural" choice for IoT description. Thus, the usage of REST services for describing IoT, and adequate system and its implementation, based on this idea, are presented in this paper too.

26. Vladimir Vujović, **Mirjana Maksimović**, Branko Perišić, Goran Milošević, *A proposition of low cost Sensor Web implementation based on GSM/GPRS services*. IEEE 1st International Workshop on Consumer Electronics, DOI:10.1109/CEWS.2015.7867154, Novi Sad, Serbia, **2015**

In past few years, automatic remote systems for monitoring a wide range of environment or process parameters have exposed a rapid growth concerning the technology issues. Entering the era of Internet of Things (IoTs), a highly dynamic and radically distributed networked system, usage of small, cheap, flexible and end-user programmable computer hardware becomes apparent. These objects, deployed in various environments, are able to communicate and to interact among themselves, with end-users or other entities in the network. Using such objects, tasks like monitoring, control or data processing can be easily done. But, in some case, the target environments are often too dangerous, hazardous, unwired, or difficult to access. In such unfriendly environments there are many challenges for monitoring systems (wireless sensor networks) deployment and maintenance. As the possible solution, in this paper we have suggested the creation of an economical remote monitoring system, based on cheap computer board (Raspberry Pi), wireless sensors and GSM/GPRS (Global System for Mobile Communications/General packet radio service). In other words, the Raspberry Pi platform is utilized as central processing unit which provides a set of services for accessing sensor data, and communicates with end users, while different types of sensors (depending of target parameters) can constitute the detection module. 3G/4G USB Modem or GSM/GPRS shields can be used as GSM/GPRS communication module in order to ensure Internet connection. A whole system presents an IoT solution, precisely a Sensor Web node, which can be accessed all over the world, and provide information from a monitored environment. Performed research shows a possibility of setting up this system for a remote communication, control function and monitoring in unfriendly environments. The usage of low cost pieces of hardware verifies that the Raspberry Pi is highly suitable for numerous IoT concept applications and especially in the unfriendly environments.

27. Владимир Вујовић, **Мирјана Максимовић**, Горан Балотић, Предраг Млинаревић, *Интернет ствари – технички и економски спекти примјене*. ИНФОТЕХ-ЈАХОРИНА, бр. 14, стр. 658-663, Јахорина, Босна и Херцеговина, **2015**

Нови начини за повезивање људи, комуникацију, стварање, коришћење и дијелење информација,

као и много тога другог, створило је информационо-комуникациони стуб друштва без којег се више не може - Интернет. Брзи развој Интернета ствара нову визију Интернета ствари - концепта, који описује повезаност паметних уређаја, конвенционалних потрошачких елемената и физичког власништва преко Интернета, омогућавајући на тај начин многе иновативне могућности. Бенефиције које се постижу увођењем нових концепата нису само социолошког и технолошког карактера, већ представљају и значајан елемент економског аспекта. Сматра се да ће Интернет ствари довести до великих новчаних уштеда, побољшања производа, квалитета услуга а самим тиме и до задовољства како произвођача тако и потрошача. Због наведених елемената, потребно се детаљно посветити анализи и развоју Интернета ствари са два веома битна аспекта: технологије и економске исплативости, што је кроз овај рад и представљено.

- 28.** Vladimir Vujovic, **Mirjana Maksimovic**, Dijana Kosmajac, Branko Perisic, *The Role of Virtualization in The Software Engineering Educational Framework Design*. 21. Naučno-stručni skup trendovi razvoja – TREND 2015, pp. 1-4, Zlatibor, Serbia, **2015**

Although it is in the field for a long period of time when compared to the speed of technology evolution, the utilisation of information and communication technologies in modern education process remains a challenging topic. In order to stay compliant and enable the openness of the applied technology infrastructure, it is essential to rely on an extendible educational framework support. Nowadays, a significant number of frameworks, developed by various educational institutions, are based on some sort of virtualization mechanisms. Virtualization covers a wide range of techniques, from application virtualization to server virtualization, and offers potential opportunities and benefits in arbitrary educational environment. In this article we have presented some leading virtualization concepts that are, up to our experience, suitable for open educational framework design. The working example of such a framework used at University of East Sarajevo, the Faculty of Electrical Engineering, is presented too.

4. ОБРАЗОВНА ДЕЛАТНОСТ КАНДИДАТА

Образовна делатност пре првог и/или /последњег избора/реизбора

Од 2006. године Мирјана Максимовић је била запослена као асистент, а од 2009. године и као виши асистент на Електротехничком факултету у Источном Сарајеву. У току рада на Електротехничком факултету ангажман у настави је обухватао извођење аудиторних и лабораторијских вежби на следећим предметима: Физика, Теорија аутоматског управљања - 1, Теорија аутоматског управљања - 2, Пројектовање система аутоматског управљања, Системи аутоматског управљања и Основи телекомуникација.

Образовна делатност после последњег избора/реизбора

Након избора у звање доцента, ангажована је на извођењу наставе на предметима првог циклуса студија: Основи телекомуникација, Пренос података, Пренос и аквизиција података, Дигитална обрада сигнала, Електромагнетика - 1 и Електромагнетика - 2, те на вежбама на предмету са другог циклуса студија Теорија стабилности система управљања.

Чланство у комисијама за одбрану докторских дисертација

Након избора у звање доцента, доц. др Мирјана Максимовић је била члан 1 (једне) комисије за одбрану докторатске дисертације:

Маријана Ћосовић, *Модели машинског учења за класификацију аномалија у BGP протоколу*, Електротехнички факултет, Универзитет у Источном Сарајеву, 25.11.2017. године

Менторство мастер радова

Након избора у звање доцента, доц. др Мирјана Максимовић је била ментор на 1 (једном) мастер раду:

Дајана Церовина, *Анализа фактора за избор инфраструктуре IoT Cloud система*, Електротехнички факултет, Универзитет у Источном Сарајеву, 10.02.2018. године

Чланство у комисијама за одбрану магистарских и мастер радова

Након избора у звање доцента, доц. др Мирјана Максимовић је била члан 1 (једне) комисије за одбрану магистарског рада:

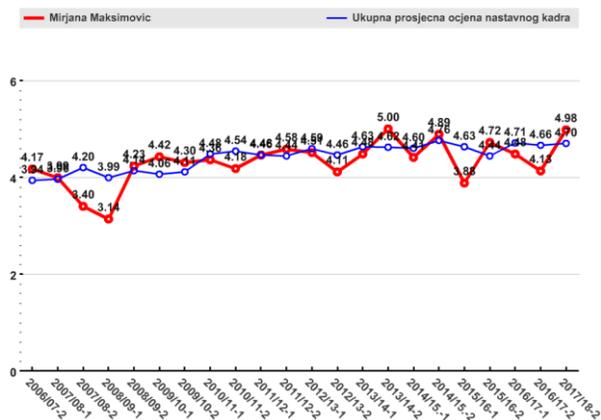
Будимир Ковачевић, *Софтверска подршка евиденцији научно истраживачких и педагошких резултата запослених у високошколским установама*, Електротехнички факултет, Универзитет у Источном Сарајеву, 25.09.2018. године;

и члан 1 (једне) комисије за одбрану мастер рада:

Марко Бошковић, *Пројектовање регулатора за интегралне и нестабилне индустријске процесе са транспортним кашњењем на принципу ARX модела*, Електротехнички факултет, Универзитет у Источном Сарајеву, 24.06.2016. године

Резултати студентске анкете

Доц. др Мирјана Максимовић има позитивне оцене у студентским анкетама које се редовно спроводе на Универзитету у Источном Сарајеву.



5. СТРУЧНА ДЕЛАТНОСТ КАНДИДАТА

Поред ангажмана у настави, од 2006. године кандидат доц. др Мирјана Максимовић је и активан учесник у организацији научно-стручног симпозијума ИНФОТЕХ-ЈАХОРИНА. Од 2016. године је и члан Програмског одбора поменутог Симпозијума, а од 2017. године је и члан програмског одбора Међународне конференције о медицинском и биолошком инжењерингу – СМВЕВИН. Од 2009. године ангажована је у Институту за стандардизацију

Босне и Херцеговине, где активно учествује у раду Техничког комитета за аутоматику, од 2011. године члан је Техничког комитета за телекомуникације, те од 2015. године и Техничког комитета за заштиту од пожара. У периоду октобар 2017. – октобар 2019. године обављала је функцију главног и одговорног уредника часописа *International Journal of Electrical Engineering and Computing* у издању Електротехничког факултета Универзитета у Источном Сарајеву и Академске мисли из Београда. Током професионалне каријере, кандидат доц. др Мирјана Максимовић је учествовала у већем броју међународних и националних пројеката, остварила сарадњу са привредом те учествовала у процесима вештачења у својству вештака телекомуникационе струке.

Учешће у пројектима пре последњег избора:

- *Distance e-learning in Electrical Engineering Education*, UNESCO-BRESCE, 2006-2007.
- *Веб апликација за анкетирање студената као софтверска подршка у процесу осигурања квалитета на високошколским установама*, Министарство науке и технологије Републике Српске, 2009-2010.
- *Моделирање компоненти хибридних система напајања*, доц. др Слободан Лубура, Министарство науке и технологије у Влади РС, 2010. 1 год., Универзитет у Источном Сарајеву, Електротехнички факултет.
- *Развој нових сензора и сензорског чвора за одређивање компоненти значајних у животној средини (H₂O₂, нитрити и нитрати у прехранбеним производима, параметри квалитета воде)*, ванр. проф. др Горан Стојановић, Министарство науке и технологије у Влади РС, 1.12.2010-1.5.2012, Универзитет у Источном Сарајеву, Електротехнички факултет.

Учешће у пројектима после последњег избора:

- *Израда елабората о минималним техничким захтјевима за пријемнике DVB-T2 у БиХ, те испитивање пријемника и усклађености са минималним техничким захтјевима за DVB-T2 емитовање – поставке и протоколи*, Универзитет у Источном Сарајеву, Електротехнички факултет, 13.12.2016 -13.01.2017; Пројекти за привреду БиХ.
- *Школа оптике*, 2017-2018, Универзитет у Источном Сарајеву, Електротехнички факултет, МIСOМ, OПТИКУМ, IУS; Пројекти за привреду БиХ.
- *Пројекат вриједности телекомуникацијских објеката фирми „Дасто Семтел“ д.о.о. Бијељина и „Калман“ Друштво за радио и телевизијску дјелатност д.о.о. Сарајево*, 2019., Универзитет у Источном Сарајеву, Електротехнички факултет; Пројекти за привреду БиХ.

Сертификати и лиценце

- MikroTIK Academy Trainer, 2016.

6. РЕЗУЛТАТ ИНТЕРВЈУА СА КАНДИДАТИМА

Интервју са кандидатом је одржан дана 24.10.2019. године у 11:00 часова у просторијама Факултета техничких наука у Новом Саду у присуству сва три члана комисије. Комисија је

пре интервјуа обавила увид у целокупну конкурсну документацију. Комисија је са кандидатом обавила разговор. На основу обављеног разговора са кандидатом доц. др Мирјаном Максимовић, као и њеног досадашњег рада, чланови комисије са задовољством констатују да кандидат поседује знања, вештине и квалитет, те испуњава опште и посебне услове конкурса, који су потребни за избор у звање ванредног професора.

7. ИНФОРМАЦИЈА О ОДРЖАНОМ ПРЕДАВАЊУ ИЗ НАСТАВНОГ ПРЕДМЕТА КОЈИ ПРИПАДА УЖОЈ НАУЧНОЈ ОБЛАСТИ ЗА КОЈУ ЈЕ КАНДИДАТ КОНКУРИСАО, У СКЛАДУ СА ЧЛАНОМ 93. ЗАКОНА О ВИСОКОМ ОБРАЗОВАЊУ

Кандидат је у наставном процесу на Универзитету у Источном Сарајеву од 2006. године, па није било потребе за одржавањем огледног предавања.

III ЗАКЉУЧНО МИШЉЕЊЕ		
Први кандидат		
Минимални услови за избор у звање	испуњава/не испуњава	Навести резултате рада (уколико испуњава)
1) има проведен најмање један изборни период у звању доцента	испуњава	У звање доцента кандидат је изабран 26.03.2015. године.
2) има најмање пет научних радова из области за коју се бира објављених у научним часописима и зборницима са рецензијом, након стицања звања доцента	испуњава	Након стицања звања доцента, кандидат је објавио 48 научних радова из области за коју се бира. Приложени радови објављени су као поглавља у научним књигама те у научним часописима и зборницима са рецензијом.
3) има објављену књигу (научну књигу, монографију или универзитетски уџбеник) или патент, односно оригинални метод у одговарајућој научној области, признат као интелектуална својина, након избора у доцента	испуњава	Након избора у звање доцента, кандидат је објавио 1 књигу (научна књига) издату од стране свјетски признатог издавача (Springer).
4) да је био члан комисије за одбрану магистарског или	испуњава	Кандидат је био члан 1 комисије за одбрану

докторског рада, или има менторство кандидата за степен другог циклуса		докторске дисертације, 1 комисије за одбрану магистарског рада, 1 комисије за одбрану мастер рада и има 1 менторство кандидата за степен другог циклуса.
Додатно остварени резултати рада (осим минимално прописаних)		
Кандидат доц. др Мирјана Максимовић је након стицања звања доцента објавила значајно већи број научних радова од минимално тражених при чему су радови кандидата, на дан 24.10.2019. године, цитирани 855 пута (према Google Scholar налогу), а вриједност h-index-a је 12.		
Други кандидат и сваки наредни уколико их има (све поновљено као за првог)		

ЗАКЉУЧНО МИШЉЕЊЕ

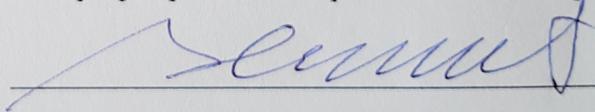
На основу анализе приложеног материјала, детаљног увида у научну, стручну и педагошку активност кандидата, Комисија констатује да кандидат доц. др Мирјана Максимовић, доцент Универзитета у Источном Сарајеву, испуњава све прописане услове за избор у академско звање ванредног професора, ужа научна област: Телекомуникације. Комисија предлаже да се кандидат доц. др Мирјана Максимовић, изабере у звање ванредног професора, ужа научна област: Телекомуникације.

Место: Нови Сад

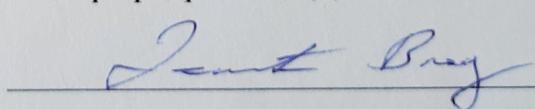
Датум: 24.10.2019. године

ЧЛАНОВИ КОМИСИЈЕ:

1. Проф. др Владимир Милошевић, председник



2. Проф. др Владо Делић, члан



3. Проф. др Мирјана Симић-Пејовић, члан

