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Datum: 12. 12. 2019

UNIVERZITET CRNE GORE

-Senatu-

-Centru za doktorske studije-

U prilogu akta dostavljamo Predlog Odluke Vijeća Prirodno-matematičkog fakulteta sa XL sjednice održane 09.12.2019. godine o imenovanju komisije za ocjenu podobnosti doktorske teze i kandidata mr Krenara Kepuške, sa pratećom dokumentacijom.

Prilog:

Potvrda o položenim ispitima

Potvrda o studiranju

Biografije i bibliografije članova komisije

DEKAN
Prof. dr Predrag Miranović

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Broj: 714

Datum: 11. 12. 2019

Na osnovu člana 64 Statuta Univerziteta Crne Gore i člana 34 Pravila doktorskih studija, Vijeće Fakulteta na XL održanoj 09.12.2019.godine, donijelo je

ODLUKU

Predlažemo Centru za doktorske studije i Senatu Univerziteta Crne Gore da imenuje Komisiju za ocjenu podobnosti doktorske teze i kandidata sa nazivom **"Pristup penetracionog testiranja u web aplikacijama kao proaktivne i odbrambene tehnologije"** kandidata mr Krenara Kepuške u sastavu:

1. Dr Milo Tomašević, redovni profesor ETF-a Univerziteta u Beogradu (naučna oblast: Računarske nauke), mentor;

2. Dr Savo Tomović, vanredni profesor Prirodno matematičkog fakulteta Univerziteta Crne Gore (naučna oblast: Računarske nauke) i

3. Dr Srđan Kadić, docent na Prirodno matematičkom fakultetu Univerziteta Crne Gore, član (naučna oblast: Računarske nauke).

Obrazloženje

Krenar Kepuška podnio je Vijeću Prirodno-matematičkog fakulteta Prijavu doktorske teze pod nazivom **"Pristup penetracionog testiranja u web aplikacijama kao proaktivne i odbrambene tehnologije".** Vijeće Prirodno-matematičkog fakulteta je shodno članu 34 Pravila doktorskih studija utvrdilo Predlog Odluke za imenovanje komisije za ocjenu podobnosti doktorske teze i kandidata.

Dostavljeno:

- Senatu
- Centru za doktorske studije
- dosije

Dekan
Prof. dr Predrag Miranović

UNIVERZITET CRNE GORE Prirodno-matematički fakultet

PRIJAVA TEME DOKTORSKE DISERTACIJE

OPŠTI PODACI O DOKTORANDU	
Titula, ime i prezime	M.Sc. Eng. Kepuska Krenar
Fakultet	Faculty of Science and Mathematics
Studijski program	Computer Science
Broj indeksa	1/2016
Ime i prezime roditelja	Djelal Kepuska
Datum i mjesto rođenja	12.10.1988 - Djakovica
Adresa prebivališta	Kalabria-Prishtine-Central Construction-O1-H1
Telefon	+38344970097
E-mail	kepuska.krenar@gmail.com

BIOGRAFIJA I BIBLIOGRAFIJA	
Obrazovanje	2012-2014 University of Tirana Faculty of Natural Science Departament of Mathematics and Informatics Master of Science M.Sc. Eng. Engineering in Mathematics and Informatics 2009-2012 University Polytechnic of Tirana Faculty of Information Technology Departament of Information Technology Bachelor of Science B.Sc. Eng.Engineering in Electronics 2004-2007 Gymnasium Departament of Natural Science

Radno iskustvo	2014 – Present College AAB, Kosovo Faculty of Computer Science Senior Lecturer and Coordinator (Full Time) Head of Quality Assurance for Learning Issues Head of Research and Innovation Centre 2015 – Present University of Djakovica, Kosovo (Part Time) Faculty of Education Lecturer 2019 – Present The british School of Kosovo ICT Lecturer
Popis radova	2017–2017 Scientific publications The Discrete Logarithm Problem INSODE - 7th world conference on innovation and computer science 2017–2017 Scientific publications Integration of Advanced ICT in cultural institution. Science Week 2017 2016–2016 Scientific publications BJIR

	Balkan Journal of Interdisciplinary Research Application of e-student and e-professor digital services in improvement of education quality at academic institutions ISSN 2410 – 759X (print), ISSN 2411 – 9725 (online) 2015–2015 Scientific publications IIPCCL International Conference on: "Interdisciplinary Studies" Integration of ICT in improvement of education quality at academic institutions ISBN: 978-99284284-6-2 2015 / 2-d ICIS / 560 564
NASLOV PREDLOŽENE TEME	
Na službenom jeziku	Pristup penetracionog testiranja u web aplikacijama kao proaktivne i odbrambene tehnologija
Na engleskom jeziku	Penetration Test Approach in Web applications as a proactive and defensive technology

Obrazloženje teme

Cyber security protection is an important topic among academic community although it is becoming an integral part of the IT infrastructure. The general concept related to cyber security in Information Technology is relatively new. Although certain academic papers have been published, their implementation is not consolidated yet.

Every day, different type of cybersecurity entities breach the security and take the advantage of vulnerabilities to access the confidential data. The more personal data we put online and the more connected we become, the more likely we are to fall victim to cyber-attacks.

Referring to the latest report from Cyber Green (Cyber-Green, 2018), which statistic reports cyber-attacks, it can be assumed that we are endangered enough. The exposure of cyber-attacks was recorded every 40 seconds, and every year the sensitive information of almost 150 million people was exposed. The web-based attacks make up for 64% of all attacks, when 59% of them are malware attacks

The major principles in cyber security are: Availability, Integrity and Confidentiality, in the other words we can call AIC triangle. Availability ensures reliability and timely access to data and resources to authorized individuals. Confidentiality ensures that the necessary level of secrecy is enforced at each junction of data processing and prevents unauthorized disclosure. Integrity consist on the assurance of the accuracy and reliability of information and systems is provided and any unauthorized modification is prevented.

To protect all the assets on ICT systems, we need to provide and increase the Availability, Confidentiality, and Integrity of ICT assets. There are multiple ways that AIC triangle can become compromised, which is why we need to provide innovations techniques with effectiveness in cyber security, to protect the ICT systems. The most effective method to assess the security of ICT infrastructure is penetration tests. Penetration testing is a scientific process, and like all scientific processes it should be repeatable by an independent party (www.infosecinstitute.com, n.d.). The different types of penetration test can be divided into four main groups: External network penetration test, internal network penetration test, Web application penetration test, and Social Engineering.

My research domain will be on penetration tests, specifically in web application penetration tests. The goal of a penetration test is to increase data security on ICT systems (Mahin Mirjalili, 2014) (Mahin Mirjalili, 2014). According to (Aileen G. Bacudio, 2011) penetration testing is a series of undertaken activities to identify and exploit security weaknesses on ICT system. Moreover, penetration testing is increasingly used by organizations to assure the security of Information systems and services, so that security weaknesses can be fixed before they get exposed.

In 2012, according to (Umrao & Kaur), one of the solutions implemented is the vulnerability assessment and penetration testing – VAPT. In addition, VAPT is a very important process helps in identifying security defects (Ashikali Hasana, 2018). However, the use of penetration testing is largely based on identification of vulnerabilities in networks, application and devices.

In 2015, according to (Jai Narayan Goela, 2015), by using Vulnerability Assessment and Penetration Testing as a cyber- defense technology administrator can be able to save his resources and critical information and can achieve proactive cyber defense. Due to that if Victim removes all the vulnerabilities from his system, the attacker would not be able to exploit the victim's system (Jai Narayan Goela, 2015).

In 2016, the proactive approach of penetration tests is considered to be better than reactive approaches followed by, for example, intrusion detection systems, because prevention is better than cure (Abid Khan, 2016).

In 2017, according to (Stiawan, Idris, Abdullah, & Aljaber, 2017) it is necessary to identify the latest types of attacks attempted to the primary security system, and with the aim of strengthening the security of the computer system, it is recommended to perform self-security audit regularly (Stiawan, Idris, Abdullah, & Aljaber, 2017).

In 2018, referring to (Alshammari, 2018), all resources must to do frequently a penetration test (PT) for the environment and see what the attacker can gain and what the current environment's vulnerabilities is.

The methodology of penetration tests does not fix the bugs on the target, it is served only to find it. The traditional methodology of web application penetration tests described by (Engebretson), consists of four phases: reconnaissance, scanning, exploitation and maintaining access. According to the most security professionals and academic lecturers, ICT systems should defend themselves against the threat environment with layers of security strategies, periodic audit to assess risks, and proactive penetration testing. Instead of waiting for attacks to occur, which is obviously unsafe, uncontrolled, and inefficient, entrepreneurs should examine their systems regularly to reveal any flaws existing in the network or website that can be taken advantage of to compromise the whole system (Tajbakhsh & Bagherzadeh., 2015).

Pregled istraživanja

Having into consideration the above mentioned, the research question of this dissertation is related to the effectiveness of the penetration testing as a defense technology. How effective are web penetration tests, what are the best countermeasures to protect web technology, specifically web applications, and which are the best preventive controls to protect web applications against the most popular vulnerabilities?

In order to respond to the research questions, a series of penetration testing will be carried out at several web application systems. We will analyze a different type of web application architectures, including different types of web programming languages, HTML, CSS, Java, Python, PHP, and Ruby.

Ultimately, our research proposal aims at providing safeguards and measures to defend information systems and their users against unauthorized access. Moreover, to ensure the confidentiality, integrity and availability of data, because according to (Zulazeze Sahri, 2014) the penetration testing process for web application in early stage will reduce the chances of the web application being exploited.

According to (Johari & Sharma., 2012), by using Penetration Testing as a cyber-defense technology an administrator can be able to save his resources and critical information and can achieve proactive cyber defense. A proactive approach is considered to be better than reactive approaches followed by, for example, intrusion detection systems, because prevention is better than cure.

According to OWASP, most popular web-applications vulnerabilities are: Injection, Broken Authentication and Session Management, Sensitive Data Exposure, XML External Entity, Broken Access Control, Security Misconfiguration, Cross-Site Scripting, Using Components with Known Vulnerabilities, and Insufficient Logging and Monitoring. (Open Web Application Security Project, 2018)

In 2015, according to (Altaf, Rashid, Dar, & Rafiq, 2015) PHP and MySQL injection, code and content injection, bypassing client-side controls, exploiting path transversal, and attacking application logic are some popular threats of web applications.

In 2017, academic researcher considers that SQL Injection, Cross Site Scripting, Remote File Inclusion and Local file inclusion are the high-risk vulnerabilities (Mitropoulos, Louridas, & Polychronakis, 2017).

In 2017, according to (Mitropoulos, Louridas, & Polychronakis, 2017), Injection, Cross-site Scripting (XSS), Broken Authentications, and sensitive data exposure are on the top of the most common vulnerabilities rated by OWASP in web applications.

In 2018, according to (Ashikali Hasana, 2018) the web application can be affected by various logical and technical vulnerabilities. SQL injection, cross site scripting, remote file inclusion and local inclusion are the examples of technical vulnerability (Hasan, M. Neva, & T. Roy, 2017).

Furthermore, according to (Ashikali Hasana, 2018), SQL Injection vulnerability may affect to dynamic web application which stored data in the associated database. Through SQL Injection, attacker passes malicious code to SQL Server through inserting it in the strings. Furthermore, this malicious code is commonly known as payloads that instruct the database server to retrieve specific information from a database (Johari & Sharma., 2012).

Also, according to (Ashikali Hasana, 2018), cross site scripting also known as XSS is scripting attack in which attacker injects or execute code through the browser at user side for the purpose to steal information of the user's credential. The typical example scenario is attacker may inject the payload to the vulnerable field of web application and when the user visits the page at the time payload placed in the page steal other user's cookie and send it to the attacker or may redirect users to phishing sites (Zalbina, et al., 2017).

There are three types of categories to recognize and find the vulnerabilities on web-applications. They know as white-box, black-box and grey-box. White-box consist of analyzing target`s code and finding vulnerabilities. Black-box uses different tools to analyze the infrastructure of web-

applications and find vulnerabilities. Grey box uses different techniques from white-box and different tools from the black-box, in addition, my research will be based on this approach.

According to (Marco Vieira, 2009) white box testing, consists of the analysis of the source code of the web application. This can be done manually or by using code analysis tools like Fortify (www.microfocus.com, n.d.), or Ounce (www.crunchbase.com, n.d.). Furthermore, according to (Marco Vieira, 2009), black box testing, consists in the analyses of the execution of the application in search for vulnerabilities.

Lack of use of a traditional methodology for penetration test may lead to an incomplete test, high time-consumption, failure and test ineffectiveness. (Mahin Mirjalili, 2014). Therefore, my proposed research will take countermeasures and preventive controls to prevent the systems from vulnerabilities and thus ensure a certain level of safety of the IT infrastructure. Once the security protection and access control are in place, the probability of the system damage will be very low. Our research will be concluded by producing a methodology which, in addition to identifying bugs, will protect the assets using security through obscurity techniques.

The major problems on web penetration tests are:

Problem 1

Penetration testers are limited to only finding vulnerabilities, not fixing them or propose a specific defense strategy.

Problem 2

Penetration test frameworks are inefficient and have a lack of effective and proactive attack methodology.

Cilj i hipoteze

The first hypothesis:

If we use Penetration test as a defense technology, then it will increase a security of a system.

The second hypothesis:

If we use penetration test as a continuous proactive framework, then it will reduce the probability of finding vulnerabilities from third parties.

Objectives:

There are two primary aims of this study:

1. To propose an effective and proactive penetration test attack model for web application vulnerabilities.

2. To design defense in-depth techniques (preventive controls) before penetration testing and propose a specific countermeasures model to provide better security from attacks referenced by OWASP.

Research Question

How effective is penetration testing as a proactive and defense technology in web applications?

Scope

Security flaws (vulnerabilities) on WEB Application

Web Application technology (HTTP, Java, ASP.net, PHP, Encoding schemes)

Materijali, metode i plan istraživanja

The methodology of our research will propose to use a specific set of tools and techniques, called a security test audit, to increase effectiveness of the web penetration test. Another point of this research is to propose a set policy that must be followed by the clients, to protect confidentiality, integrity, and the availability of web application data. Moreover, the methodology will ensure access to data and to resources to authorized entities only, will ensure the protection of assets from modification processes and will increase the protection of the web applications against the threats they face nowadays. By this methodology we aim at establishing availability, integrity, confidentiality and security risk management of assets using penetration tests as defense technology. The result of the research can be implemented in different entities which manage sensitive data in web applications. Web applications provide an interface between end users and web-server through a set of web pages that are generated at the server end or contain script code to be executed dynamically within the client web browser. Web applications are vulnerable to various attacks. The research also will contribute to protect the privacy and integrity of sensitive data.

The methodology that we intend to use in this research to test web technology will be based on different phases:

1) Gathering Information, Identifying Vulnerabilities, and collecting as much information as possible about a target web application.

2) Analyze and Test Client-Side Control, Test the Authentication Mechanism, Test the Session Management Mechanism, Test Access Controls, Test for Input-Based Vulnerabilities (Injecting Code), Injecting into Interpreted Languages, Test for XSS and Other Response Injection, Exploiting Path Traversal, Test for Logic Flaws, Exploiting Information Disclosure, and Test for Web Server Vulnerabilities.

3) Create Preventive Controls and Defense Techniques (Handling Client-Side Data Securely, securing authentication, Securing Session Management, Securing Access Controls, Preventing Path Traversal Vulnerabilities, Avoiding Logic Flaws, Preventing XSS Attacks, Preventing Information Leakage, and Securing Web Server Software).

The research methodology will be based on the different topics as follows:

1) Cryptanalysis of Injection flaws.
Distrusted data are interpreted and executed as part of a command or query. Attackers exploit injection flaws by constructing malicious commands or queries that result in data loss or corruption, lack of accountability, or denial of service.

2) Cryptanalysis of SQL Injection.
SQL Injection uses a series of malicious SQL queries to directly manipulate the database, bypass normal security measures and obtain direct access to the valuable data.

3) Cryptanalysis of Cross-Site Scripting.
CSS or XSS exploits vulnerabilities in dynamically generated web page, which enables malicious attackers to inject client-side script into web pages viewed by other users. XSS inject malicious JavaScript, VBScript, ActiveX, HTML or FLASH for execution on the target system by hiding it with legitimate requests.

4) Cryptanalysis of Security Misconfiguration
Gaining unauthorized access to default accounts, exploit dispatched flaws, and read or write unprotected files and directories.

5) Cryptanalysis of buffer overflow.
Applications write more data to a block of memory, then the buffer is allocated to hold.

6) Cryptanalysis of Cookie/Session Poisoning.
Modification of the contents of a cookie in order to bypass security mechanism, obtain the unauthorized information.

7) Cryptanalysis of cryptographic storage.
The application uses poorly written encryption code to store sensitive data in databases.

Očekivani naučni doprinos

This research proposal aims at producing a methodology for the Security of Web applications, based on an assessment through different types of penetration tests, identification of vulnerabilities, collection of inputs from tests and the provision of countermeasures and preventive controls which aim at eliminating the vulnerabilities and exposures to risk. The benefit of this approach is that we will use penetration test as a proactive approach.

The proposed methodology will be based on three phases:

I. Gathering information and identifying a vulnerability

II. Attacking web applications vulnerabilities

III. Creating on preventive controls and defense techniques

<table>
<tr><th colspan="4">Traditional Penetration Tests Framework</th></tr>
<tr><td></td><td>Identify</td><td>Analyze</td><td>Report</td></tr>
<tr><td>Devices
Applications
Network
Data</td><td>Penetration Test</td><td>Penetration Test</td><td>Penetration Test</td></tr>
<tr><td></td><td colspan="3">Technology and Process</td></tr>
</table>

<table>
<tr><th colspan="6">My Research Proposal (Framework)</th></tr>
<tr><td></td><td>Detection</td><td>Identification</td><td>Analyze</td><td>Response</td><td>Recovery</td></tr>
<tr><td>Devices
Applications
Network
Data</td><td>Preventive Controls</td><td colspan="2">Proactive Penetration Test</td><td colspan="2">Countermeasures</td></tr>
<tr><td></td><td colspan="5">Technology and Process</td></tr>
</table>

My research proposal will be held effective prevention (procedures, countermeasures, techniques which are implementing early stages to avoid further problems), effectiveness (procedures which are based on proactive practice).

Spisak objavljenih radova kandidata

CRYPTANALYSIS AND VULNERABILITIES BASED ON WI-FI PROTOCOLS

8th International Conference on Education (ICED 2019)

2019

DISCRETE LOGARITHM PROBLEM

7th World Conference on Innovation and Computer Science (INSODE-2017)

2017

INTEGRATION OF ADVANCED ICT IN CULTURAL INSTITUTION.

Science Week / MASHT

2017

APPLICATION OF E-STUDENT AND E-PROFESSOR DIGITAL SERVICES IN IMPROVEMENT OF EDUCATION QUALITY AT ACADEMIC INSTITUTIONS

BJIR – Balkan Journal of Interdisciplinary Research, ISSN 2410 – 759X (print), ISSN 2411 – 9725 (online), 2016 / Vol.1, No.3 / 325 – 330 - 2016

INTEGRATION OF ICT IN IMPROVEMENT OF EDUCATION QUALITY AT ACADEMIC INSTITUTIONS

IIPCCL – Second International Conference on: "Interdisciplinary Studies" ISBN: 978-9284284-6-2 / 2015 / 2-d ICIS / 560– 564

2015

International School on Cyber-Security (7-27 July 2019)

University of Algebra, Zagreb (Croatia)

Attack Phases, Penetration testing, TCP/IP protocols, Network devices, Cryptography, Windows OS, Linux OS, Web application security incident, Web technologies and concepts, Web servers' concepts and differences, Bypassing client-side controls, Authentication attacks, Design/Implementation flaws, OWASP TOP 10: Injection, OWASP TOP 10: XSS/CSRF

Erasmus+ Staff Mobility Agreement for Training (1-5 July 2019)

Radboud University, Nijmegen (Netherlands)

- Academic skills
- Writing PhD Thesis
- Higher Education Mobility Agreement
- Staff development

Certificate of Participation (May 2019)

College AAB, Pristina

Workshop on Publishing in Academic Journals

Certificate of Participation (May 2019)

College AAB, Pristina

Workshop on data Security

Popis literature

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SAGLASNOST PREDLOŽENOG/IH MENTORA I DOKTORANDA SA PRIJAVOM		
Odgovorno potvrđujem da sam saglasan sa temom koja se prijavljuje.		
Prvi mentor	Milo Tomašević	
Drugi mentor	(Ime i prezime)	(Potpis)
Doktorand	(Ime i prezime)	(Potpis)

IZJAVA

Odgovorno izjavljujem da doktorsku disertaciju sa istom temom nisam prijavio/la ni na jednom drugom fakultetu.

U (Podgorica),
(07.11.2019)

Ime i prezime doktoranda

UNIVERZITET CRNE GORE
PRIRODNO-MATEMATIČKI FAKULTET
RAČUNARSKE NAUKE
Broj dosijea: **1/2016**

Na osnovu člana 165 stava 1 Zakona o opštem upravnom postupku ("Službeni list RCG", broj 60/03.), člana 115 stava 2 Zakona o visokom obrazovanju ("Službeni list CG", broj 44/14.) i službene evidencije, a po zahtjevu studenta Kepuska Xhela Krenar, izdaje se

UVJERENJE O POLOŽENIM ISPITIMA

Student **Kepuska Xhelal Krenar**, rođen **12-10-1988** godine u mjestu **Đakovica**, Republika **Kosovo**, upisan je studijske **2016/2017** godine, u **I** godinu studija, kao student koji se **samofinansira** na **doktorske akademske studije,** studijski program **RAČUNARSKE NAUKE**, koji realizuje **PRIRODNO-MATEMATIČKI FAKULTET** - Podgorica Univerzite Crne Gore u trajanju od **3** (**tri**) godine sa obimom **180** ECTS kredita.

Student je položio ispite iz sljedećih predmeta:

Redni broj	Semestar	Naziv predmeta	Ocjena	Uspjeh	Broj ECTS kredita
1.	1	MATEMATIKA- DOKTORSKI ISPIT	"C"	(dobar)	10.00
2.	1	ODABRANA POGLAVLJA IZ KRIPTOGRAFIJE I	"C"	(dobar)	5.00
3.	1	ODABRANA POGLAVLJA IZ KRIPTOGRAFIJE II	"A"	(odličan)	10.00
4.	1	RAČUNARSKE NAUKE-DOKTORSKI ISPIT	"A"	(odličan)	10.00
5.	1	SIGURNOST I ZAŠTITA RAČUNARSKIH SISTEMA	"B"	(vrlodobar)	5.00

Zaključno sa rednim brojem **5.**

Ostvareni uspjeh u toku dosadašnjih studija je:
- srednja ocjena položenih ispita **"B" (9.13)**
- ukupan broj osvojenih ECTS kredita **40.00** ili **66.67%**
- indeks uspjeha **6.09**.

Uvjerenje se izdaje na osnovu službene evidencije, a u svrhu ostvarivanja prava na: (dječji dodatak, porodičnu penziju, invalidski dodatak, zdravstvenu legitimaciju, povlašćenu vožnju za gradski saobraćaj, studentski dom, studentski kredit, stipendiju, regulisanje vojne obaveze i slično).

M. P.

Broj:
Podgorica, 29.11.2019 godine

SEKRETAR,
Ivanović Nataša

UNIVERZITET CRNE GORE
PRIRODNO-MATEMATIČKI FAKULTET
RAČUNARSKE NAUKE
Broj dosijea: **1/2016**

Na osnovu člana 165 Zakona o opštem upravnom postupku ("Službeni list RCG" br. 60/03) i službene evidencije, a po zahtjevu Kepuska Xhelal Krenar, izdaje se

POTVRDA O STUDIRANJU

Student **Kepuska Xhelal Krenar**, rođen **12-10-1988** godine u mjestu **Đakovica**, Republika **Kosovo**, upisan je studijske **2016/2017** godine, u `I` godinu studija, kao student koji se **samofinansira** na **akademske doktorske studije**, studijski program **RAČUNARSKE NAUKE**, koji realizuje **PRIRODNO-MATEMATIČKI FAKULTET** - Podgorica Univerziteta Crne Gore u trajanju od **3** (**tri**) godine sa obimom **180** ECTS kredita.

Studijske **2018/2019** godine prijavio je *da sluša* **5** predmeta sa **50.00** (pedeset) ECTS kredita.

Po prvi put iz `III` (**treće**) godine, prijavio je *da sluša* **0** predmeta sa **0.00** (nula) ECTS kredita, što iznosi 0.00% od ukupnog broja ECTS kredita u `III` godinu.

Saglasno Statutu Univerziteta Crne Gore, **Kepuska Xhelal Krenar** je po prvi put prijavio *da sluša* **manje od 2/3**, odnosno **66,67% (šezdesetšest 67/100 %)**, od ukupnog broja ECTS kredita sa `III` godine i studijske **2018/2019 nema status redovnog studenta** koji se **samofinansira.**

Uvjerenje se izdaje na osnovu službene evidencije, a u svrhu ostvarivanja prava na: (dječji dodatak, porodičnu penziju, invalidski dodatak, zdravstvenu legitimaciju, povlašćenu vožnju za gradski saobraćaj, studentski dom, studentski kredit, stipendiju, regulisanje vojne obaveze i slično).

M. P.

Broj:
Podgorica, 29.11.2019 godine

SEKRETAR,
Ivanović Nataša

Мило Томашевић

А. Биографски подаци

Мило Томашевић је рођен 18.05.1957. године у Никшићу. Основну школу и гимназију завршио је у Никшићу као носилац дипломе "Луча", која представља еквивалент Вукове дипломе. Током школовања освајао је прва места на градским, републичким и савезним (СФРЈ) такмичењима из математике, историје и географије. На Електротехнички факултет у Београду, Одсек за електронику, уписао се 1975. године. Током студија је више пута добијао награде Универзитета за постигнут успех у претходној години студија. Дипломирао је 1980. године и исте године се уписао на постдипломске студије на овом факултету, на Смеру за електронику. Магистарски рад одбранио је 1984. године. Докторску дисертацију одбранио је 1992. године, такође на Електротехничком факултету у Београду. Додељена му је 1989. године и стипендија Републичке заједнице науке Србије за стручно усавршавање у иностранству. У оквиру научне специјализације боравио је као гостујући истраживач 1990-91. године на универзитету Purdue, West Lafayette, САД.

У звање доцента са трећином радног времена изабран је 1993. године на Катедри за рачунарску технику и информатику Електротехничког факултета у Београду. На истој Катедри је, затим, 1995. године изабран за доцента са пуним радним временом. Тренутно је редовни професор на Катедри за Рачунарску технику и информатику Електротехничког факултета у Београду.

На XXVII конференцији ЕТАН-а 1982. године, добио је награду Економског факултета из Суботице, а на XXXV конференцији ЕТАН-а 1991. године награђен је за најбољи рад у секцији за рачунарску технику. На IEEE/ACM конференцији HICSS-92 добио је другу награду у секцији за архитектуру рачунара. На XLIX конференцији ЕТРАН-а 2005. године, добио награду за најбољи рад у секцији за рачунарску технику и информатику.

Био је рецензент за више међународних часописа, као и домаћих часописа и конференција. Одржао је, са коауторима, више предавања по позиву код нас и у иностранству (САД, Немачка, Италија, Сингапур, Јужна Кореја, Пољска, Бугарска) у разним компанијама (Encore, NCR, TDT), на универзитетима и престижним међународним конференцијама (ISCA, HPCA, HPC).

Ожењен је и отац двоје деце, Војислава (1999) и Весне (2004).

Б. Дисертације

1. **Томашевић М.**, "Софтверски систем за развој микропрограма процесора мултипроцесне обраде", магистарска теза, Електротехнички факултет у Београду, септембар 1984.
2. **Томашевић М.**, "Нови хардверски протокол за кохеренцију кеш меморија у мултипроцесорским системима са заједничком меморијом", докторска теза, Електротехнички факултет у Београду, децембар 1992.

В. Наставна активност

На основним студијама, мастер и докторским студијама на Електротехничком факултету у Београду држи десетак курсева од којих је већину сам засновао или значајно иновирао. Повремено је држао је наставу и на другим сродним факултетима у окружењу, од којих се посебно издваја ангажовање на одновним и постдипломским студијама Универзитета Црне Горе - Природно-математичком факултету (1993. -2013.) и Електротехничком факултету (1993. - 1999.) .

Био је ментор или члан комисије за већи број завршних радова студената на различитим нивоима студија на Електротехничком факултету у Београду и учествовао у комисијама за оцену и одбрану докторских дисертација на другим сродним универзитетима код нас и у окружењу.

Кандидат је аутор или коаутор следећих књига и уџбеника:

1. **Tomašević M.**, Milutinović V., *Cache Coherence Problem in Shared Memory Multiprocessors: Hardware Solutions*, IEEE Computer Society Press, Los Alamitos, CA, USA, July 1993. ISBN 0-8186-4092-8

2. Protić, J., **Tomašević M.**, Milutinović V., *Distributed Shared Memory: Concepts and Systems,* IEEE Computer Society Press, Los Alamitos, CA, USA, July 1997. ISBN 0-8186-7737-6

3. **Томашевић М.**, *Алгоритми* и *структуре података*, (406 страна), Академска мисао, Београд, 2000., IV издање 2008. ISBN 978-86-7466-328-8

Књига 3 се користи као уџбеник за комплетно градиво из предмета *Алгоритми и структуре података,* као и *Алгоритми и структуре података 1 и 2*. Ова књига се, такође, користи као једини уџбеник из сличних предмета на више сродних факултета у региону.

Књиге 1 и 2 су коришћене као литература за предмет *Мултипроцесорски системи*, као и на постдипломској настави из области мултипроцесорских система. Ове књиге су коришћене у постдипломској настави и на неким универзитетима у иностранству. Ове књиге у издању IEEE Computer Society Press су имале значајну продају и цитираност у претходном периоду.

Г. Библиографија научних и стручних радова

По подацима базе **Scopus Google Scholar** дају 620 цитата без аутоцитата свих аутора.

1. Радови у међународним часописима (М20)

1. **Tomašević M.**, Milutinović V., "Hardware Approaches to Cache Coherence in Shared-Memory Multiprocessors, Part 1," *IEEE Micro,* Vol.14., No.5, October 1994., pp. 52-59.

ISSN 0272-1732 - Časopis sa *SCI* *Impact Factor*: 0.43 M23

2. **Tomašević M.**, Milutinović V., "Hardware Approaches to Cache Coherence in Shared-Memory Multiprocessors, Part 2," *IEEE Micro,* Vol.14., No.6, December 1994., pp. 61-66.

ISSN 0272-1732 - Časopis sa *SCI* liste *Impact Factor*: 0.43 M23

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ISSN: 0141-9331 - Časopis sa *SCI* liste *Impact Factor*: 0.163 (1996) M23

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5. Grujić A., **Tomašević M.**, Milutinović V., "A Simulation Study of Hardware-Oriented DSM Approaches", *IEEE Parallel & Distributed Technology*, Vol. 4, No. 1, Spring 1996, pp. 74-83. Napomena: Današnji naziv - *IEEE Concurrency*

ISSN: 1063-6552 - Časopis sa *SCI* liste *Impact Factor*: 1.727 (1998) M21

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ISSN: 1383-7621 - Časopis sa *SCI* liste *Impact Factor*: 0.029 (1998) M23

8. Bojović M., **Tomašević M.**, Đorđević J., "The Interactive Development and Testing System for a RISC-Style Processor," *The Computer Journal*, Vol. 42, No. 5, 1999.

ISSN: 0010-4620 - Časopis sa *SCI* liste *Impact Factor*: 0.349 (1999) M23

9. Đorđević J., Bojović M., **Tomašević M.**, Lazić B., Velašević D., "A RISC-Style Hardware Accelerator for Operating Systems," *International Journal of Computers and Applications*, Vol. 21, No. 2, 1999, pp. 50-55.

ISSN: 1206-212X Časopis bez *impact factora*

10. **Tomašević M.**, Bojović M., Đorđević J., "A Hardware Implemenation of the Mechanism of Multiprocessing", *Microprocessors and Microsystems*, Vol. 23, December 1999, pp. 471-479.
ISSN: 0141-9331 - Časopis sa *SCI* liste *Impact Factor*: 0.151 (1999) M23

11. Punt M., **Tomašević M.**, Đorđević J., "Evaluation and Analysis of an On-line Error Detection Monitoring Technique", *Computers and Electrical Engineering*, Vol. 39, Iss. 2, February 2013, pp. 261-273.

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12. Tomašević V., **Tomašević M.**, "An Analysis of Chain Characteristics in the Cryptanalytic TMTO Method", *Theoretical Computer Science,* Vol. 501, August 2013, pp. 52-61.

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16. Trobec R., Vasiljević R., **M. Tomašević**, Milutinović V., Beivide R., Valero M., "Interconnection Networks in Petascale Computer Systems: A Survey", *ACM Computing Surveys*, Vol. 49, No. 3, Sep, 2016, pp. 1-25.

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ISSN: 0065-2458 - Časopis sa *SCI* liste Impact Factor: 0.256 (2015) M23

2. Радови у домаћим часописима (М50)

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2. **Tomašević M.**, Protić J., Savić S., Jovanović M., Grujić A., Milutinović V. "A Reflective Memory System for Personal Computers", *The IPSI Bgd Transactions on Internet Research*, Vol. 2, No. 2, July 2006, pp. 7-12. ISSN: 1820-4503

3. Radulović M., **Tomašević M.** "On Reducing Overheads in CMP TLS Integrated Protocols", *The IPSI Bgd Transactions on Internet Research*, Vol. 3, No. 1, January 2007, pp. 11-17. ISSN: 1820-4503

4. Tomašević V., **Tomašević M.**, "Pregled i analiza kriptoanalitičkih TMTO metoda", *Singidunum revija*, Beograd, oktobar 2010., pp. 141-152. ISSN: 1820-8819

5. Milivojević M., Đurđević Đ., **Tomašević M.**, "Architecture of a System for Interactive Training and Testing in Algorithms and Data Structures", *Telfor Journal,* Vol.3 No.1 (2011). ISSN: 1821-3251 (M53)

6. Mišić M., **Tomašević M.**, "Data Sorting Using Graphics Processing Units", *Telfor Journal*, Vol. 4 No.1, (2012). ISSN: 1821-3251 (M53)

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3. Радови саопштени на међународним научним скуповима (М30)

1. **Tomašević M.**, Milutinović V., "A Simulation Study of Snoopy Cache Coherence Protocols", *25th Hawaii International Conference on System Sciences*, Kauai, USA, January 1992., pp. 427-436.

2. **Tomašević M.**, Milutinović V., "A Survey of Hardware Solutions for Maintenance of Cache Coherence in Shared-Memory Multiprocessors", *26th Hawaii International Conference on System Sciences*, Maui, USA, January 1992., pp. 863-872.

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4. Grujić A., **Tomašević M.**, Milutinović V., "A Simulation Study of Hardware-Oriented DSM Approaches", *IEEE Region 10's 9th Annual International Conference,* Singapore, August 1994, pp. 386-390.

5. Jovanović M., **Tomašević M.**, Milutinović V., "Design Issues in Block-Oriented Reflective Memory System," *Proceedings of XVI Int. Symposium on Nuclear Electronics and Computing*, Varna, September 1994.

6. Protić J., **Tomašević M.**, Milutinović V., "A Survey of Distributed Shared Memory Approaches," *Proceedings of XVI Int. Symposium on Nuclear Electronics and Computing*,Varna, September 1994.

7. Jovanović M., **Tomašević M.**, Milutinović V., "A Simulation Analysis of Two Reflective Memory Approaches," *28th Hawaii International Conference on System Sciences*, Maui, USA, January 1995.

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9. Milutinović V., **Tomašević M.**, Marković B., Tremblay M. "A New Cache Architecture Concept: The Split Temporal/Spatial Cache," *Proceedings of the MELECON96*, Bari, Italy, May 1996, pp. 1108-1111.

10. Protić J., Tartalja I., **Tomašević M.**, "Memory Consistency Models for Shared Memory Multiprocessors and DSM Systems," *Proceedings of the MELECON96*, Bari, Italy, May 1996, pp. 1112-1115.

11. Milutinović V., Marković B.,**Tomašević M.**, Tremblay M. "The Split Temporal/Spatial Cache: A Performance Analysis," *Proceedings of 5th SCIzzL*, Santa Clara, USA, March 1996, pp. 63-69.

12. Milutinović V., Marković B.,**Tomašević M.**, Tremblay M. "The Split Temporal/Spatial Cache: A Complexity Analysis," *Proceedings of 6th SCIzzL*, Santa Clara, USA, September 1996, pp. 87-96.

13. Tončev M., **Tomaševic M.**, Aleksić M., "The Impact of Out-of-Order Message Delivery on Cache Coherence Protocols", *Proceedings of the IEEE Canadian Conference on Electrical and Computer Engineering*, Toronto, 2001. pp. 399-404.

14. Tončev M., Djordjević J.,**Tomaševic M.**, Aleksić M., "Multithreaded Communication Controller For Efficient DSM Multiprocessors", *Proceedings of the IEEE Canadian Conference on Electrical and Computer Engineering*, Toronto, 2001.

15. Tončev M., **Tomaševic M.**, Djordjević J., Aleksić M., "Improving Performance of a DSM System by the Communication Controller Organization", *Proceedings of the IEEE Canadian Conference on Electrical and Computer Engineering*, Toronto, 2004.

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17. **Tomašević M.,** Puzović N., Leković S., "Analysis and Improvement of Replacement Algorithms in SMP cache memory systems", *Proceedings of the ACACES (Advanced Computer Architecture and Compilation for Embedded Systems)*, L'Aquila, July 2005.

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21. Radulović M., Girbal S., **Tomašević M.**, "Simulation Support for Speculative Multithreading Processors", *Proceedings of the ACACES (Advanced Computer Architecture and Compilation for Embedded Systems)*, L'Aquila, July 2008.

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27. Štrbac-Savić S., **Tomašević M.**, "Comparative Performance Evaluation of the AVL and Red-Black Trees", *V Balcan Conference in Informatics*, Novi Sad, September 2012.

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29. Mišić M., Bethune I., **Tomašević M.,** "Automated Regression Testing and Code Coverage Analysis of the CP2K Application", 7th IEEE *International Conference on Software Testing, Verification, and Validation*, Cleveland, USA, April 2014.

30. Vesović M., Smiljanić A., **Tomašević M.,** "Speeding up IP Lookup Procedure in Software Routers by Means of Parallelization", *XXIV telekomunikacioni forum TELFOR*, Beograd, Novembar 2016.

30. Mišić M., Nikolov D., Protić J., **Tomašević M.,** "Paralelizacija GST algoritama za detekciju sličnosti u programskom kodu", *XXIV telekomunikacioni forum TELFOR*, Beograd, Novembar 2016.

4. Радови саопштени на домаћим научним скуповима (М60)

1. Potić V., Đorđević J., Lazić B., Velašević D., Ranđić S., Tomašević M. "Arhitektura i organizacija procesora multiprocesne obrade", *XXVII Konferencija ETAN-a*, Subotica, Jun 1982.

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5. Радови у публикацијама страних и домаћих научних института

1. **Tomašević M.,** Radulović M., "Speculative Chip Multiprocessors", *Proceedings of International Workshop devoted to the 25th Anniversary of Faculty of Natural Sciences,* Podgorica, September 2005, pp. 168-186.

Д. Пројекти и реализације

Кандидат је био учесник више десетина домаћих и међународних пројеката који су као резултат имали реализације хардверско-софтверских производа и студије, од којих су неки имали и значајне реализације.

Ђ. Остали резултати, стручне и друштвене активности

Кандидат је обављао или и даље обавља следеће дужности на Електротехничком факултету:

1. Продекан за сарадњу са привредом (од 2015 до сада)
2. Шеф Катедре за Рачунарску технику и информатику (од 2012 до 2015).
3. Заменик шефа Катедре за Рачунарску технику и информатику (од 2006 до 2012).
4. Заменик шефа Одсека за Рачунарску технику и информатику.
5. Члан Наставне комисије.
6. Члан Комисије за признавање страних високошколских исправа.

Кандидат је обављао или и даље обавља следеће струковне дужности:

1.Члан струковне организације HiPEAC (European Network of Excellence on High Performance and Embedded Architecture and Compilation).

2. Члан управљачког комитета акције EURO COST TM

3. Рецензент радова у међународним часописима: IEEE Transactions on Computers, IEEE Proceedings, IEEE Micro, IEEE Concurrency, Software: Practice and Experience) и међународних конференција (ICPP, HICSS, COMPSAC),

4. Рецензент у домаћим часописима (Telfor Journal, Yujor, Serbian Journal of Electrical Engineering) и конференција (ЕТРАН, ТЕЛФОР, Информационе Технологије, Инфотек, итд.)

5. Члан програмског одбора конференције *Информационе Технологије*

6. Члан Програмског одбора и Научног одбора, као и координатор секције Софтерски алати и апликације међународне конференције ТЕЛФОР

prof. M. Томашевић

УНИВЕРЗИТЕТ У БЕОГРАДУ ЕЛЕКТРОТЕХНИЧКИ ФАКУЛТЕТ
БЕОГРАД

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ПРИМЉЕНО 13 -07- 2015

Орг. јед.	Број	Прилог	Вредност
	63/7		

СЕНАТ УНИВЕРЗИТЕТА
У БЕОГРАДУ

Београд, 08.07.2015. године
06-01 Број: 61202-2450/3-15
МЦ

На основу чл. 65. ст. 2. Закона о високом образовању ("Службени гласник РС", број 76/05, 100/07-аутентично тумачење. 97/08, 44/10 и 93/12), чл. 42. ст. 1. тач. 23. и чл. 43. ст. 4. Статута Универзитета у Београду ("Гласник Универзитета у Београду", број 162/11-пречишћени текст и 167/12), чл. 25. ст. 1. и ст. 2. тач. 1. Правилника о начину и поступку стицања звања и заснивања радног односа наставника Универзитета у Београду ("Гласник Универзитета у Београду", број 142/08, 150/09 и 160/11) и Критеријума за стицање звања наставника на Универзитету у Београду ("Гласник Универзитета у Београду", број 140/08, 144/08, 160/11, 161/11, 165/11), а на предлог Изборног већа Електротехничког факултета, број: 63/5 од 21.04.2015. године и мишљења Већа научних области техничких наука, број: 61202-2450/2-15 од 08.06.2015. године, Сенат Универзитета, на седници одржаној 08.07.2015. године, донео је

О Д Л У К У

БИРА СЕ др Мило Томашевић у звање редовног професора на Универзитету у Београду-Електротехнички факултет, за ужу научну област Рачунарска техника и информатика.

О б р а з л о ж е њ е

Електротехнички факултет је дана 14.01.2015. године у листу „Послови" објавио конкурс за избор у звање редовног професора, за ужу научну област Рачунарска техника и информатика, због истека потреба Факултета.

Извештај Комисије за припрему извештаја о пријављеним кандидатима стављен је на увид јавности дана 23.02.2015. године преко сајта Факултета.

На основу предлога Комисије за припрему извештаја о пријављеним кандидатима, Изборно веће Електротехничког факултета, на седници одржаној дана 21.04.2015. године, донело је одлуку о утврђивању предлога да се кандидат др Мило Томашевић изабере у звање редовног професора.

Електротехнички факултет је дана 21.05.2015. године доставио Универзитету комплетан захтев за избор у звање на прописаним обрасцима.

Универзитет је комплетну документацију коју је доставио Факултет ставио на web страницу Универзитета дана 01.06.2015. године.

Веће научних области техничких наука, на седници одржаној дана 08.06.2015. године дало је мишљење да се др Мило Томашевић може изабрати у звање редовног професора.

Сенат Универзитета, на седници одржаној дана 08.07.2015. године разматрао је захтев Електротехничког факултета и утврдио да кандидат испуњава услове прописане чл. 64. и 65. Закона о високом образовању, чланом 124. Статута Универзитета у Београду, као и услове прописане Критеријумима за стицање звања наставника на Универзитету у Београду, па је донета одлука као у изреци.

ПРЕДСЕДНИК СЕНАТА
Ректор
Проф. др Владимир Бумбаширевић

Доставити:
- Факултету (2)
- архиви Универзитета
- сектору 06

doc. dr Savo Tomović

Rođen je u Podgorici 29. 09. 1983. godine. Prirodno-matematički fakultet Univerziteta Crne Gore, Odsjek za matematiku i računarske nauke, smjer računarske nauke upisao je 2002. godine a završio u julu 2006. godine sa prosječnom ocjenom 9,81.

Završio je 2007. godine postdiplomske studije na Prirodno-matematičkom fakultetu Univerziteta Crne Gore, studijski program Računarske nauke, sa prosječnom ocjenom 10,00 i odbranio magistarsku tezu pod nazivom *Data mining tehnike za asocijativna pravila u relacionim bazama podataka.*

Godine 2008. upisao je doktorske studije na Prirodno-matematičkom fakultetu Univerziteta Crne Gore, studijski program Računarske nauke. U redovnim rokovima položio je sve ispite sa ocjenom A i prijavio doktorsku disertaciju pod nazivom *Algoritmi i strukture podataka za identifikovanje asocijativnih pravila u velikim bazama podataka*. Pomenutu doktorsku disertaciju, uspješno je odbranio 22. X 2011. godine i stekao akademski stepen doktora računarskih nauka.

U toku studija bio je dobitnik više nagrada od kojih su najznačajnije: Plaketa Univerziteta Crne Gore za oblast tehničkih nauka za 2006. godinu, Studentska nagrada 19. decembar Skupštine opštine Podgorica za 2005. godinu, Stipendija za talentovane studente Ministarstva prosvjete i nauke za 2003/2004, 2004/2005 i 2005/2006 godinu.

Honorarno je angažovan 2006. godine a od 2007. i zaposlen kao saradnik u nastavi na Prirodno-matematičkom fakultetu Univerziteta Crne Gore. Izvodio je vježbe iz predmeta Operativni sistemi, Programski prevodioci, Vještačka inteligencija i Analitička obrada podataka (data mining) na Prirodno-matematičkom fakultetu, kao i iz informatičkih predmeta na Medicinskom i Građevinskom fakultetu.

U maju 2012. godine izabran je u zvanje docenta za predmete **Principi programiranja** na studijskom programu Računarske nauke, **Analitička obrada podataka - Data Mining** na specijalističkom studijskom programu Računarske nauke na Prirodno-matematičkom fakultetu, **Primjena računara** na studijskom programu Građevinarstvo na Građevinskom fakultetu i **Medicinska informatika** na studijskom programu Stomatologija na Medicinskom fakultetu.

Odlukom Ministarstva nauke Crne Gore proglašen je za najuspješnijeg mladog naučnika do 35 godina života za 2012. godinu.

Od decembra 2013. godine rukovodilac je studijskih programa Računarske nauke i Računarstvo i informacione tehnologije na Prirodno-matematičkom fakultetu.

Izabrane publikacije:

1. Predrag Stanišić, Savo Tomović, "A New Rymon Tree Based Procedure for Mining Statistically Significant Frequent Itemsets", International Journal of Computers Communications & Control, Vol. 5(4), pp. 567-577, 2010 [SCI Expanded]
2. Predrag Stanišić, Savo Tomović, "Apriori Multiple Algorithm for Mining Association Rules", Information Technology and Control, Vol. 37, No. 4, 2008 [SCI Expanded]
3. Predrag Stanišić, Savo Tomović, *Hypothesys Testing Aproach in Mining Statistically Significant Frequent Itemsets*, Mathematica Montisnigri, 2012 [Zentralblatt Math, AMS]
4. Predrag Stanišić, Savo Tomović, "An Efficient Procedure for Mining Statistically Significant Frequent Itemsets", Publications de l'Institut Mathematique, Nouvelle Serie, Vol. 87 (101), 2010 [Zentralblatt Math, AMS]
5. Predrag Stanišić, Savo Tomović, *An Improvement of Data Mining Apriori Technique*, Mathematica Montisnigri, Vol. 20-21, 2008 [Zentralblatt Math, AMS]
6. Predrag Stanišić, Savo Tomovic, Upper Bounds on the Number of Candidate Itemsets in Apriori Like Algorithms, Proccedings of the 3nd Mediterranean Conference on Embedded Computing , 2014 [IEEE Xplore, digital library]
7. Predrag Stanišić, Savo Tomovic, *Frequent Itemset Mining as Set Interection Problem*, Proccedings of the 2nd Mediterranean Conference on Embedded Computing , 2013 [IEEE Xplore, digital library]
8. Predrag Stanišić, Savo Tomovic, *Frequent Itemset Mining using Two-Fold Cross Validation Model*, Proccedings of the 1st Mediterranean Conference on Embedded Computing , 2012 [IEEE Xplore, digital library]
9. Savo Tomović, Predrag Stanišić, *Cross Validation Method in Frequent Itemset Mining*, Proccedings of the Central European Conference on Information and Intelligent Systems, 2011
10. Savo Tomović, Predrag Stanišić, *Mining the Most k-Frequent Itemsets with TS-trie*, Proccedings of the IADIS International Conference WWW/Internet 2009, 2009 [DBLP, AMS]

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Broj / [illegible]

Datum / Date 16. 10. 2017

Na osnovu člana 72 stav 2 Zakona o visokom obrazovanju („Službeni list Crne Gore" br. 44/14, 47/15,40/16,42/17) i člana 32 stav 1 tačka 9 Statuta Univerziteta Crne Gore, Senat Univerziteta Crne Gore na sjednici održanoj 16.oktobra 2017.godine, donio je

O D L U K U
O IZBORU U ZVANJE

Dr Savo Tomović bira se u akademsko zvanje **vanredni profesor za oblast Analiza i obrada podataka, Programiranje i informatika na nematičnim fakultetima,** na period od pet godina.

Senat Univerziteta Crne Gore
Predsjedavajući

Prof.dr Danilo Nikolić,v.f.rektora

UNIVERZITET CRNE GORE UCG 1974

BIOGRAFIJA

Rodjen sam 11.09.1968.godine u Beogradu. Osnovnu i srednju školu završio sam u Podgorici sa odličnim uspjehom. Diplomirao sam na prirodno-matematičkom fakultetu u Podgorici na Odjseku za matematiku i računarske nauke, smjer računarstvo. Postdiplomske studije sam upisao na Odsjeku za matematiku i računarske nauke, smjer računarstvo Matematičkog fakulteta u Beogradu. Zbog specifičnosti teme dio ispita sa postdiplomskih studija sam polagao na Elektro-tehničkom fakultetu u Beogradu. Magistarski rad pod nazivom "Algoritam sortiranja za hardverski akcelerator obrade podataka" odbranio sam na Matematičkom fakultetu u Beogradu. Doktorske studije upisao sam na na prirodno-matematičkom fakultetu u Podgorici na Odjseku za matematiku i računarske nauke, smjer računarstvo. Disertaciju pod nazivom "Algoritam provjere serijalizovanosti konkuretnog izvršavanja transakcija" odbranio sam na Prirodno-matematičkom fakultetu u Podgorici.

Od oktobra 1994.godine radim u nastavi na Odsjeku za matematiku i računarske nauke Prirodno-matematičkog fakulteta u Podgorici. U nastavi držim predavanja/ vježbe iz predmeta: Računari i programiranje, Principi programiranja, Vizuelizacija i računarska grafika, Uvod u informacione sisteme, Softver inžinjering, Napredne progamske tehnike i Razvoj aplikacija na prenosvim uređajima.

Funkciju prodekana za finansije na Prirodno-matematičkom fakultetu u Podgorici obavljao sam u periodu 2013-2016.

PREGLED RADOVA I BODOVA NAKON PRETHODNOG IZBORA

1. NAUČNOISTRAŽIVAČKA DJELATNOST	Br. ref.	Br. kan.
1.3.1. Monografije –		
1. **Crna Gora u XXI stoljeću – u eri kompetitivnosti – Nauka i Tehnologija,** izdavač CANU, knjiga 73/11, **Srđan Kadić,** Informacione i komunikacione tehnologije, 517-537	10	2
1.2.1 Radovi objavljeni u časopisima koji se nalaze u međunarodnim bazama podataka		
2. Tomović S., Stanišić P., Kadić S., **Data Mining Approach In Climate Classification And Climate Network Construction – Case Study Montenegro**, Vol. 25 No.4 2018, pp. 1037-1043.Tehnički vjesnik/Technical Gazzete, University of Osijek, Technical Faculty, Slavonski Brod, Croatia, ISSN 1330-3651 [baza podataka: SCIE, priložen rad] https://doi.org/10.17559/TV-20160913205831	7	7
3. Kadić S.,Tomović S., **Computer-Based Validation of 3N+1 Hypothesis for Numbers 3^n-1**, Vol. 26 No. 2 2019, pp. 289-293,Tehnički vjesnik/Technical Gazzete, University of Osijek, Technical Faculty, Slavonski Brod, Croatia, ISSN 1330-3651 [baza podataka: SCIE, priložen rad] https://doi.org/10.17559/TV-20161108221649	7	7
1.3.1. Radovi na međunarodnim kongresima i seminarima		
1. Božović V., Kadić S., Kovijanić-Vukićević Ž., Orbits of a k-sets of Zn, Proccedings of the Third Mathematical Conference of Republic of Srpska, 2013, pp. 177 -187, ISBN 978-99976-600-0-8 [priložen rad]	2	1
1.3.2. Radovi na domaćim kongresima i seminarima		
1. Ivanović I., Kadić S.,Using OpenFlow standard for Feedback-based NFS server balancing, 2014, 60-63, ISSN: 978-86-85775-15-4, XIX, IT Žabljak, [priložen rad]	1	1

3. PEDAGOŠKA DJELATNOST	Br. ref.	Br. kan.
3.1.2 Univerzitetski udžbenik – korišćenje referentnog inostranog udžbenika kod nas	5	5
1. Ian Sommerville, Software Engineering, 10th Edition, Pearson		
2. S. Marchner, P.Shirley, Fundamentals of Computer Graphics, 4th edition		
3. R.Daigneu, Service Design patterns: Fundamental Design Solutions		
3.4.2. Mentorstvo – na dodiplomskom studiju		
1. Leon Đuravčaj, XML praktična primjena, odbranjen 03.12.2018.godine	0.5	0.5
2. Nikolina Sekulić, CSS Layout, odbranjen 30.11.2018.godine	0.5	0.5
3. Jovan Gajić, Java Script, odbranjen 06.11.2017.godine	0.5	0.5
4. Ljubomir Stijepović, UpotrebaOpenSource tehnologija na primjeru GIS sistema, odbranjen 29.08.2013.godine	0.5	0.5
3.5. Kvalitet pedagoškog rada		

4. STRUČNA DJELATNOST	Br. ref.	Br. kan.
4.6. Ostala stručna djelatnost - prenos rezultata naučnog rada u praksu; prenos znanja u proizvodnju ili u rad državnih i drugih organa i organizacija; saradnja u izradi stručnih osnova za nove propise; aktivnosti u organima međunarodnih udruženja	20	20
4.6.1 Rad sa talentovanom i darovitim djecom i omladinom		
1. Mensa Crna Gora – punopravni član Mense International, predsjednik 2000-2012.		
2. Fondacija Mladi pronalazači Crne Gore,predsjednik 2010-.		
2.1. First Lego League, 2010-, robotika za djecu uzrasta 10-16 godina internacionlano takmičenje		
2.2. Sajam Pronalazača 2010-2016, program podrške za mlade pronalazače		
2.3. Invetors's Space – kutak za pronalazače – ETF Podgorica (2013), 10 000 dolara vrijedna donacija Američke Ambasade (prvi 3D štampač itd.)		
2.4. Software Developer Space – PMF Podgorica (2016), donacija vrijedna 215 000 dolara - softver za računarsku salu.		
4.6.2 Stručna tijela		
1. Vlada Crne Gore - Radna grupa za pripremu i vođenje pregovora o pristupanju Crne Gore Evropskoj uniji koja se odnosi na pregovaračko poglavlje 10 – Informatičko društvo i mediji.		
2. Ministarstvo Nauke i tehnologije - upravni odbor projekta "Visoko obrazovanje i istraživanje za inovacije i konkurentnost - INVO".		
3. CANU – Odbor za Informaciono komunikacione tehnologije.		
4. Vlada Crne Gore - Radna grupa za praćenje implementacije akcionog plana za sprovođenje Strategije IKT pravosuđa 2016-2020.		

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Na osnovu člana 72 stav 2 Zakona o visokom obrazovanju („Službeni list Crne Gore" br 44/14, 47/15, 40/16, 42/17, 71/17, 55/18, 3/19, 17/19, 47/19) i člana 32 stav 1 tačka 9 Statuta Univerziteta Crne Gore, Senat Univerziteta Crne Gore na sjednici održanoj 28.10.2019. godine, donio je

O D L U K U
O IZBORU U ZVANJE

Dr Srđan Kadić bira se u akademsko zvanje docent Univerziteta Crne Gore za **oblast Računarstvo i programiranje**, na Prirodno-matematičkom fakultetu Univerziteta Crne Gore, na period od pet godina.

SENAT UNIVERZITETA CRNE GORE
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Prof. dr Danilo Nikolić, rektor