

**21. ТЕЛЕКОМУНИКАЦИОНИ ФОРУМ**  
***21<sup>th</sup> TELECOMMUNICATIONS FORUM***

**ТЕЛФОР 2013**

***TELFOR 2013***



**ПРОГРАМ**  
***PROGRAM***

**Београд, 26, 27. и 28. новембар 2013.**

**ГОДИНЕ**

***Belgrade, 26, 27 and 28 November 2013***

**Сава центар**

***THE SAVA CENTER***

# **WEB АПЛИКАЦИЈА И ЛОГИСТИЧКА ПОДРШКА**

*WEB Application and Logistic*

**Gordan Ružić, RC ETF Beograd**  
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**TIME TABLE**  
**Telecommunications Forum TELFOR 2013**

**26<sup>th</sup> November, Tuesday Morning**

9:00 Start of Registration – Registration desk, The Sava Center, Main Hall

10:30 – 12:00 OPENING CEREMONY - Rooms 1 + 1a + 1b /0

12:00 – 13:00 Welcome Party – Sava Center Restaurant

**26<sup>th</sup> November, Tuesday afternoon**

Room Time	3/1	4/1	5/1	6/1	
14:30-16:45	CS 1 4.1-4.6	Commercial presentations	MM 1 8.1-8.8	SP 1 5.1-5.7	
17:00-19:15	CS 2 4.7-4.13		MM 2 8.9-8.16	SP 2 5.8-5.14	

Room Time	1/0	1a/0	1b/0	Japan salon/1	9a/0
14:30-16:45	SPECIAL SESSIONS FOR COMPANIES	PRS 1 1.1-1.10	STA 1 9.1-9.8	TECHNICAL & INFORMATION PRESENTATIONS	IEEE
17:00-19:15			STA 2 9.9-9.14		

**27<sup>th</sup> November, Wednesday morning**

Room Time	3/1	4/1	5/1	6/1	
8:30-10:45	CS 3 4.14-4.20	Commercial presentations	RC 1 3.1-3.8	SP 3 5.15-5.21	
11:00-13:15	AEL 1 6.1-6.7		RC 2 3.9-3.17	SP 4 5.22-5.29	

Room Time	1/0	1a/0	1b/0	Japan Salon/1	9a/0
8:30-10:45	SPECIAL SESSIONS FOR COMPANIES	TN 1 2.1-2.8	STA 3 9.15-9.21	TECHNICAL & INFORMATION PRESENTATIONS	Workshop „Leadership Skills“ Prof. Kurt Richter
11:00-13:15		TN 2 2.9-2.15	STA 4 9.22-9.29		

## 27<sup>th</sup> November, Wednesday afternoon

Room Time	3/1	4/1	5/1	6/1	
14:30-16:45	AEL 2 6.8-6.15	Commercial presentations	MM 3 8.17-8.25	AEM 1 7.1-7.6	
17:00-19:15	CS 4 4.21-4.27		AEM 2 7.7-7.12		

Room Time	1/0	1a/0	1b/0	Japan salon/1	9a/0
14.30-17.00	SPECIAL SESSIONS FOR COMPANIES	TN 3 2.16-2.22	STA 5 9.30-9.36	TECHNICAL & INFORMATION PRESENTATIONS	S 1 10.1-10.6
17.00-19.15		TN 4 2.23-2.29	STA 6 9.37-9.43		S 2 10.7-10.14

## 28<sup>nd</sup> November, Thursday morning

Room Time	3/1	4/1	5/1	6/1	
8:30-10:45		Commercial presentations	AEL 3 6.16-6.23		
11:00-13:15	CS 5 4.28-4.34		AEL 4 6.24-6.30	AEM 3 7.13-7.17	

Room Time	1/0	1a/0	1b/0	Japan salon/1	9a/0
8:30-10:45		TN 5 2.30-2.36	STA 7 9.44-9.50		
11:00-13.15			STA 8 9.51-9.58		

Section 1	Policy, Regulatory Aspects and Services in Com.	Room 1a/0	PRS 1
Section 2	Telecommunications Networks	Room 1a/0	TN 1-6
Section 3	Radio Communications	Room 5/1	RC 1-2
Section 4	Communications Systems	Room 3/1	CS 1-4
Section 5	Signal Processing	Room 6/1	SP 1-4
Section 6	Applied Electronics	Room 3/1	AEL 1-2
Section 6	Applied Electronics	Room 5/1	AEL 3-4
Section 7	Applied Electromagnetics	Room 6/1	AEM 1-3
Section 8	Multimedia	Room 5/1	MM 1-3
Section 9	Software Tools and Applications	Room 1b/0	STA 1-8
Section 10	Student Papers	Room 9a/0	S 1-2

- Room 1/0 – Special Sessions for Companies, international and domestic companies and institutions presentations
- Japan Salon/1 - Technical and Information Presentations (see the detailed program)
- Rooms 4/1 - Commercial Presentations (see the detailed program)
- Sava Center Main Hall – Registration desk, Exhibitions (see the detailed program)
- Room 9/0 – Public Relation Room, Meetings, Workshop

**САТНИЦА**  
**Телекомуникациони форум ТЕЛФОР 2013**

**26. новембар, уторак пре подне**

9:00 Почетак регистрације учесника, Регистрациони пулт, хол Сава центра  
10:30 – 12:00 **СВЕЧАНО ОТВАРАЊЕ** - Сале 1 + 1а + 1b /0  
12:00 – 13:00 Коктел добродошлице, Ресторан Сава центра

**26. новембар, уторак после подне**

Сала Време	3/1	4/1	5/1	6/1	
14:30-16:45	СПС 1 4.1-4.6	Комерцијалне презентације	ММ 1 8.1-8.8	ОС 1 5.1-5.7	
17:00-19:15	СПС 2 4.7-4.13		ММ 2 8.9-8.16	ОС 2 5.8-5.14	

Сала Време	1/0	1а/0	1б/0	Јапански салон/1	9а/0
14:30-16:45	ПОСЕБНЕ СЕКЦИЈЕ КОМПАНИЈА	ПРУ 1 1.1-1.10	САА 1 9.1-9.8	ТЕХНИЧКЕ И ИНФОРМАЦИОНЕ ПРЕЗЕНТАЦИЈЕ	IEEE
17:00-19:15			САА 2 9.9-9.14		

**27. новембар, среда пре подне**

Сала Време	3/1	4/1	5/1	6/1	
8:30-10:45	СПС 3 4.14-4.20	Комерцијалне Презентације	РК 1 3.1-3.8	ОС 3 5.15-5.21	
11:00-13:15	ПЕЛ 1 6.1-6.7		РК 2 3.9-3.17	ОС 4 5.22-5.29	

Сала Време	1/0	1а/0	1б/0	Јапански салон/1	9а/0
8:30-10:45	ПОСЕБНЕ СЕКЦИЈЕ КОМПАНИЈА	ТМ 1 2.1-2.8	САА 3 9.15-9.21	ТЕХНИЧКЕ И ИНФОРМАЦИОНЕ ПРЕЗЕНТАЦИЈЕ	Радионица „Leadership Skills“ Prof. Kurt Richter
11:00-13:15		ТМ 2 2.9-2.15	САА 4 9.22-9.29		

## 27. новембар, среда после подне

Сала Време	3/1	4/1	5/1	6/1	
14:30-16:45	ПЕЛ 2 6.8-6.15	Комерцијалне Презентације	ММ 3 8.17-8.25	ПЕМ 1 7.1-7.6	
17:00-19:15	СПС 4 4.21-4.27			ПЕМ 2 7.7-7.12	

Сала Време	1/0	1a/0	1b/0	Јапански салон/1	9a/0
14.30-17.00	ПОСЕБНЕ СЕКЦИЈЕ КОМПАНИЈА	ТМ 3 2.16-2.22	САА 5 9.30-9.36	ТЕХНИЧКЕ И ИНФОРМАЦИОНЕ ПРЕЗЕНТАЦИЈЕ	С 1 10.1-10.6
17.00-19.15		ТМ 4 2.23-2.29	САА 6 9.37-9.43		С 2 10.7-10.14

## 28. новембар, четвртак пре подне

Сала Време	3/1	4/1	5/1	6/1	
8:30-10:45		Комерцијалне презентације	ПЕЛ 3 6.16-6.23		
11:00-13:15	СПС 5 4.28-4.34			ПЕЛ 4 6.24-6.30	ПЕМ 3 7.13-7.17

Сала Време	1/0	1a/0	1b/0	Јапански салон/1	9a/0
8:30-10:45		ТМ 5 2.30-2.36	САА 7 9.44-9.50		
11:00-13.15			САА 8 9.51-9.58		

Секција 1	Политика, регулатива и услуге у телеком	Сала 1a/0	ПРУ 1
Секција 2	Телекомуникационе мреже	Сала 1a/0	ТМ 1-6
Секција 3	Радио-комуникације	Сала 5/1	РК 1-2
Секција 4	Системи преноса сигнала	Сала 3/1	СПС 1-4
Секција 5	Обрада сигнала	Сала 6/1	ОС 1-4
Секција 6	Примењена електроника	Сала 3/1	ПЕЛ 1,2
Секција 6	Примењена електроника	Сала 5/1	ПЕЛ 3,4
Секција 7	Примењена електромагнетика	Сала 6/1	ПЕМ 1-3
Секција 8	Мултимедија	Сала 5/1	ММ 1-3
Секција 9	Софтверски алати и апликације	Сала 1b/0	САА 1-8
Секција 10	Студентска секција	Сала 9a/0	С 1-2

- Сала 1/0 – Посебне секције водећих домаћих и интернационалних компанија и институција (видети детаљан програм у наставку)
- Јапански салон/1, – Техничке и информационе презентације (видети детаљан програм у наставку)
- Сале 4/1 - Комерцијалне презентације (видети детаљан програм у наставку)
- Централни хол Сава центра – Регистрациони пулт, изложбе (видети детаљан програм у наставку)
- Сала 9/0 – Контакт сала, састанци, радионица

# TELFOR 2013

## **СВЕЧАНО ОТВАРАЊЕ** - *Opening Ceremony*

Уторак 26.11.2013. године, 10:30 часова

*Tuesday 26<sup>th</sup> November, 2012, 10:30 a.m.*

Сава Центар, Сале 1+1a+1b / *The Sava Center, Rooms 1+1a+1b*

## **ПЛЕНАРНА СЕДНИЦА** - *Plenary Session*

**Увод** - *Introduction*

**Поздравне речи** - *Welcome Messages*

**Признања** - *Recognitions*

**Излагање по позиву** - *Invited Presentation*

*Hans Ovesen*

*VP Industry Relations Business Unit Networks*

*ERICSSON*

**„MOBILE BROADBAND A TECHNOLOGY DRIVING  
GROWTH AND BUILDING ECONOMIES “**

**Завршне речи** - *Conclusions*

Председник Управног одбора - *Chairman of the Steering Committee*

Проф. др Ђорђе Пауновић - *Prof. Dr George Paunović*

**Коктел добродошлице** - *Welcome Reception*

Домаћин - *Host*

Друштво за телекомуникације - *Telecommunications Society*



## **COMPANIES EXHIBITORS AT THE EXHIBITION**

### **ФИРМЕ ИЗЛАГАЧИ НА ИЗЛОЖБИ**

	<b>Firma/Organization</b>	<b>Lokacija/Locatio n</b>
	<b>IEEE SERBIA &amp; MONTENEGRO</b>	<b>Registracioni pult <i>Registration Desk</i></b>
	<b>AKADEMSKA MISAO</b>	<b>Registracioni pult <i>Registration Desk</i></b>
<b>1</b>	<b>IRITEL AD</b>	<b>A2</b>
<b>2</b>	<b>ENEL PS</b>	<b>A3</b>
<b>3</b>	<b>TELEKOM SRBIJA AD</b>	<b>P5</b>
<b>4</b>	<b>ROHDE &amp; SCHWARZ</b>	<b>D1</b>
<b>5</b>	<b>GMB Automatik</b>	<b>E1</b>
<b>6</b>	<b>KOVING</b>	<b>P1</b>
<b>7</b>	<b>CIP-NETWORKS d.o.o.</b>	<b>P3</b>
<b>8</b>	<b>ALGOTECH d.o.o.</b>	<b>P4</b>
<b>9</b>	<b>VLATACOM</b>	<b>F</b>
<b>10</b>	<b>London School of Commerce</b>	<b>A4</b>
<b>11</b>	<b>First Telecom ltd</b>	<b>A5</b>
<b>12</b>	<b>Phoneco</b>	<b>A6</b>
<b>13</b>	<b>Impuls telekomunikacije d.o.o.</b>	<b>A7</b>
<b>14</b>	<b>MAKSNET d.o.o.</b>	<b>A8</b>
<b>15</b>	<b>SAT TRAKT</b>	<b>C1</b>

## **COMMERCIAL PRESENTATIONS**

### **КОМЕРЦИЈАЛНЕ ПРЕЗЕНТАЦИЈЕ**

<b>Компанија <i>Company</i></b>	<b>Дан <i>Day of the week</i></b>	<b>Датум <i>Date</i></b>	<b>Време <i>Time</i></b>	<b>Сала <i>Room</i></b>
ENELPS	Уторак/Tuesday	26.11.	13:00-13:45	4/1
IRITEL	Уторак/Tuesday	26.11.	14:00-14:45	4/1
NAJNOVIJA TEHNIČKO-TEHNOLOŠKA REŠENJA - OTP10G OTN/DWDM optička transportna platforma + Sistem za efikasno korišćenje alternativnih izvora energije				
Algotech	Уторак/Tuesday	26.11.	15:00-15:45	4/1
First Telecom ltd	Среда/Wednesday	27.11.	09:00-10:45	4/1
Rohde-Schwarz	Среда/Wednesday	27.11.	11:00-11:45	4/1
Mr. Damir Zibrat , Analiza principa rada digitalnih storage osciloskopa nove generacije i njihova primena u telekomunikacijama"				
SAT TRAKT	Среда/Wednesday	27.11.	12:00-13:45	4/1
SIAE Microelettronica, Milano & IRITEL a.d. Beograd	Среда/Wednesday	27.11.	14:00-14:45	4/1
Microwave/Millimeter-wave Radio for Point-to-Point applications				
First Telecom ltd & HUGES	Четвртак/Thursday	28.11.	11:00-11:45	4/1

SPECIAL EVENTS PROGRAM  
**ПРОГРАМ ПОСЕБНИХ ДОГАЂАЈА**

**MAIN HALL 1/0 / САЛА 1/0**

**SPECIAL SESSIONS FOR COMPANIES**  
**ПОСЕБНЕ СЕКЦИЈЕ КОМПАНИЈА**

*November 26, Tuesday afternoon / 26. Новембар, уторак после подне*

**14:00-14:55** VLATACOM d.o.o.

- *Topic/Тема:* **Razvoj i trendovi u oblastima elektronske uprave i bezbednosti**  
*Presenter/Предавач:* **Dr Miloš Borenović, dipl. ing., VLATACOM**

**15:00-15:55** NOKIA SOLUTIONS AND NETWORKS Serbia

- *Topic/Тема:* **Technology Vision 2020**  
*Presenter/Предавач:* **Francesca Sartori, NSN (in English)**
- *Topic/Тема:* **Liquid Application**  
*Presenter/Предавач:* **Alessandro di Salvo, NSN (in English)**

**16:00-16:55** VIP MOBILE

- *Topic/Тема:* **Uvođenje 100G koherentne tehnologije u DWDM transportnoj mreži  
Vip mobile i Telekom Austrija Grupe**  
*Presenter/Predavač:* **Ranko Drobnyak, VIP mobile**

*November 27, Wednesday morning / 27. Новембар, среда пре подне*

**10:00-10:55** IBIS INSTRUMENTS

*Topic/Тема:* **Big data – big challenge and big opportunity for Telco operators in the new  
age of our Industry**  
*Presenter/Predavač:* **Novica Ninić, Ibis Instruments (in English or Serbian)**

**11:00-11:55** TELEKOM SRBIJA

- *Topic/Тема:* **Na korak od all IP mreže**  
*Presenters/Предавачи:* **Nemanja Ognjanović, TELEKOM Srbija**

**12:00-12:55** IBM

- *Topic/Тема:*  
*Presenter/Предавач:*

*November 27, Wednesday afternoon / 27. Новембар, среда после подне*

**15:00-15:55 TELEKOM SRBIJA**

- *Topic/Тема: Automatizacija procesa u Cloud-u*  
*Presenters/Предавачи: Borko Drašković, Vladan Nešić, Jasmina Arsić,*  
**TELEKOM Srbija**

## **JAPAN SALON/1 / ЈАПАНСКИ САЛОН/1**

### **TECHNICAL AND INFORMATION PRESENTATIONS** **ТЕХНИЧКЕ И ИНФОРМАЦИОНЕ ПРЕЗЕНТАЦИЈЕ**

*November 27, Wednesday morning / 27. Новембар, среда пре подне*

**10:00-10:55 APEX SOLUTION TECHNOLOGY**

- *Topic/Тема: BusPlus – Integrisani informacioni sistem za naplatu karata i upravljanje javnim prevozom u Beogradu*  
*Presenters/Предавачи: Rade Vujović, Dragan Travica, Apex Solution Technology*

**11:00-11:55 FAKULTET TEHNIČKIH NAUKA**  
**UNIVERZITETA U NOVOM SADU**

- *Topic/Тема: Presentacija govornih tehnologija razvijenih za srpski i demonstracija prvih primena*  
*Presenters/Предавачи: Vlado Delić i Darko Pekar*

Razvoj govornih tehnologija na FTN podržava MPNTR, kao i FID preko AlfaNuma. Uz prezentaciju dostignuća u razvoju govornih tehnologija za srpski i srodne južno-slovenske jezike, biće demonstrirane njihove prve aplikacije kao što su preslušavanje teksta (npr. vesti na internetu) ili govorne komande za mobilne telefone (poruke i pozivi), kućne centrale (pozivi po imenu) i pametne kuće (komande uređajima).

**12:00-12:55 TELEKOM SRBIJA - ELEKTROTEHNIČKI FAKULTET BGD**

- *Topic/Тема: Low EMF Exposure Futures Networks - LEXNET projekat*  
*Presenters/Предавачи: Mladen Korpivica, Milica Popovic, Jelena Milinković,*  
**Stevan Nikšić, Aleksandar Nešković**

**13:00-13 :55 Tehnička prezentacija po pozivu**

- *Topic/Тема: Praksa projektovanja telekomunikacionih mreža i sistema u objektima (3)*  
*Presenter/Предавач: Mirjana Jarić-Ćirić,*

**16:00-18 :00 OKRUGLI STO RATEL-a**

**SISTEM ZA KONTINUALNI AUTOMATSKI MORITORING RADIO-FREKVENCIJSKOG SPEKTRA NA TERITORIJI REPUBLIKE SRBIJE**

Organizator: **Republička agencija za elektronske komunikacije - RATEL**  
Predsedavajući: **Dr Milan Janković, direktor RATEL-a.**  
Uvodničari: **Dr Vladica Tintor, pomoćnik direktora RATEL-a,**  
**Mr Dejan Vujić, Elektrotehnički fakutet Beograd.**

U skladu sa regulatornim obavezama da obezbediti optimalne i realne uslove za razvoj elektronskih komunikacija, kao i uslove za ravnopravno poslovanje svih učesnika na tržištu, kako u tehnološkom tako i u ekonomskom smislu, Republička agencija za elektronske komunikacije (RATEL) preduzima neophodne aktivnosti za optimalno i racionalno korišćenje ograničenih resursa, frekvencija i numeracije, kao i sveobuhvatnu zaštitu interesa svih učesnika na tržištu, u cilju pružanja novih kvalitetnijih ali i jeftinijih usluga.

Kako se procesom prelaska sa analognog na digitalno emitovanje oslobađa deo spektra za nove širokopolasne sevice, to je Republička agencija za elektronske komunikacije započela izgradnju nacionalnog sistema za kontrolu i nadgledanje frekvrncijskog spektra. Navedene aktivnosti imaju za cilj da omoguće izgradnju informaciono-komunikacionog sistema RATEL-a koji treba da unapredi postupak kontrole radio-frekvencijskog spektra, automatizuje i optimizuje postojeće procese planiranja i rada u ovoj delatnosti RATEL-a.

U okviru prezentacije biće predstavljene dosadašnje aktivnosti RATEL-a na izgradnji kontrolno-mernog sistema, organizaciji merne kampanje i razvoju softverskih rešenja kao i planovi za predstojeći period.

***EXHIBITION/ИЗЛОЖБА***

***PTT „Serbia“, PTT Museum /ПТТ „Србија“, Музеј ПТТ***

***Author/Аутор***

***Željko Sarić, custodian, PTT Museum***

***Жељко Сарић, кустос, Музеј ПТТ***

***Beginnings of Serbian Telephony, Period 1883-1912***

***Почеси српске телефоније, период 1883-1912.***

***THE SAVA CENTER MAIN HALL/Главни хол САВА ЦЕНТРА***

## **Workshop**

### *Development of Leadership Skills*

**Trainer Dr. Kurt Richter**

*Emeritus Professor of Electrical Engineering  
University of Technology Graz, Austria*

TELFOR 2013

Wednesday, 27.11.2013.

8:30-14:00h

Room 9a/0

(free participation – registration required)

**Language:** *English*  
**Time:** *approx. 5-6 hours*  
**Target Group:** *Engineering students and young engineers*  
**Participants:** *Optimum are 30 participants*

**Objectives:** *The workshop is an introduction into the principles of Leadership skills and comprises topics as leading of groups and teams. A considerable part of the workshop deals with meeting management, conflict styles, conflict management and dealing with difficult people and integration a group.*

**Content:** *The structure of the workshop is interactive where tests and group work combined with discussion and presentation of results have high priority to frontal lecturing. The workshop is modular structured in comprising 8 topics:*

1. Introduction into Leadership
2. Leadership Skills and Attributes of a Leader
3. Leader versus Manager – A Comparison
4. Body Language
5. Engineering Ethics
6. Personal Interactive Skills
7. Meeting Management
8. Conflict Management

**Facilities:** *Flipchart, (White- or Blackboard, (computer-) projektor, Internet access (when available)*

## INVITED PAPERS

- 4.1. Stošović N. Slavimir, Dimitrijević R. Bojan, Milošević D. Nenad, Nikolić Zorica: **Reduction of the Effect of Carrier Frequency Offset at Orthogonal Frequency Division Multiplexing Systems** (*invited paper*)
- 4.7. Nikolić Z. Bojana, Đorđević T. Goran: **On the Effect of Imperfect Reference Signal Recovery on BER Performance of PSK Receiver in Composite Fading Channel** (*invited paper*)
- 4.14. Cvetković Aleksandra, Đorđević T. Goran: **Outage Performance of Cooperative Relaying Systems in Interference-limited Environment** (*invited paper*)
- 4.21. Jan Mikkelsen, Felice Tafuri, Troels Nielsen, Ming Shen, Wei Wei, Ole Jensen: **The Development of Microwave Power Amplifiers and Nonlinear Measurement Systems – is the Measurement Systems Manufacturer still Lead by the PA Designer?** (*invited paper*)
- 5.1. Kojić S. Nenad: **Implementations of Hopfield neural network in communication networks** (*invited paper*)
- 5.8. Velimirović Lazar, Perić Zoran, Stanković Miomir, Nikolić Jelena: **Design of compandor quantizer using spline approximations** (*invited paper*)
- 5.15. Bojanić Milana, Delić Vlado: **Automatic emotional speech recognition in Serbian language** (*invited paper*)
- 5.22. Despotović Vladimir, Perić Zoran: **Design of Nonlinear Predictors for Adaptive Predictive Coding of Speech Signals** (*invited paper*)
- 7.1. Rančić P. Milica, Aleksić R. Slavoljub: **Analysis of Wire Antenna Structures above Lossy Homogeneous Soil** (*invited paper*)
- 9.37. Đurđević M. Đorđe, Tartalja I. Igor: **Fast CUDA-based Codec for Height Fields** (*invited paper*)

**2013 21st Telecommunications Forum (TELFOR)**  
**XXI ТЕЛЕКОМУНИКАЦИОНИ ФОРУМ ТЕЛФОР 2013**

# **Proceedings of Papers**

**Зборник радова**

Belgrade, Serbia, November, 26-28, 2013

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