Business forum: 27 - 29.01.2016

Program / Programme

27.01.2016	Sreda / Wednesday

10.30 – 11.00
Business Forum

Predstavitev Odbora za znanost in tehnologijo pri Obrtno-podjetniški zbornici Slovenije (OZS) in partnerjev na sejmu IFAM-INTRONIKA 2016

Predavatelj : Janez Škrlec

Odbor za znanost in tehnologijo letos praznuje 10 let delovanja. Odbor za znanost in tehnologijo (OZT) je bil pri Obrtno-podjetniški zbornici Slovenije ustanovljen leta 2006, kot prvi odbor v Sloveniji, ki bo zgradil mostove med gospodarstvom, (še zlasti OZS), fakultetami, univerzami in inštituti. Odbor za znanost in tehnologijo vodi vsa leta delovanja predsednik, **Janez Škrlec**. Vloga odbora OZT je približevanje novih in prihajajočih tehnologij obrtnikom in podjetnikom, še zlasti na propulzivnih področjih, kot je elektronika, IKT, mehatronika, avtomatika, robotika, bionika, področje novih materialov in nanotehnologije. Povezovanje gospodarstva in znanosti je sila zapleten proces in uspešnost v tem procesu je odvisna tudi od širše družbene podpore.

Odbor za znanost in tehnologijo sodeluje z naslednjimi partnerji:

Institutom Jožef Stefan, Kemijskim inštitutom v Ljubljani, FERI-Univerzo v Mariboru, Fakulteto za elektrotehniko, Univerze v Ljubljani, Univerzo v Novi Gorici, Univerzo v Mariboru, Centrom odličnosti Namaste in Centrom odličnosti za nanoznanosti in nanotehnologijo – Nanocentrom. Občasno sodeluje tudi z NIB – Nacionalnim inštitutom za biologijo v Ljubljani, Fakulteto za strojništvo, Univerze v Mariboru in Fakulteto za strojništvo, Univerze v Ljubljani, ter Ministrstvom za izobraževanje, znanost in šport in drugimi.

Na sejmu IFAM-INTRONIKA bo Odbor za znanost in tehnologijo predstavil primere dobre prakse sodelovanja s partnerji v zadnjih letih.

Presentation of the Committee on Science and Technology at the Chamber of Crafts of Slovenia (OZS) and partners at the Fair IFAM-INTRONIKA 2016

Speaker : Janez Škrlec

The Committee of Science and Technology is celebrating 10 years of operation. The Committee on Science and Technology, abbreviated (OZT), was established in 2006 at the Chamber of Craft of Slovenia as the First Committee in Slovenia. It is meant to build bridges of between industry (especially OZS), faculties, universities and institutes. The OZT is being directed all the years of operation by the President, Janez Škrlec.

The role of OZT is to introduce new and emerging technologies to craftsmen and traders, especially in propulsive areas such as electronics, ICT, mechatronics, automation, robotics, bionics, new materials and nanotechnology.

Linking business and science is a complicated process and its success depends also on broad social support.

The OZT cooperates with the following partners:

Jozef Stefan Institute, Institute of Chemistry in Ljubljana, FERI-University of Maribor, Faculty of Electrical Engineering, University of Ljubljana, University of Nova Gorica, University of Maribor, Centre of Excellence Namaste and Centre of Excellence on Nanoscience and Nanotechnology - Nanocentrom. The Committee occasionally cooperates with the National Institute of Biology (NIB) in Ljubljana, the Faculty of Mechanical Engineering, the University of Maribor, the Faculty of Mechanical Engineering, the University of Ljubljana and the Ministry of Education, Science and Sports and others.

At the fair IFAM-INTRONIKA the Committee on Science and Technology will present cases of successful cooperation with partners in the recent years.

11.00 – 11.30
Business Forum

Radar z umetno odprtino

Predavatelj: dr. Dušan Gleich
UM FERI, Inštitut za avtomatiko

V modernih metodah obdelave signalov srečamo radarsko tehniko zmeraj bolj pogosto. Najdemo jo v navigacijskih in nadzornih sistemih, sistemih za lokalizacijo tarč v zaprtem prostoru, sistemih za zgodnje odkrivanje naravnih nesreč in kot pripomočke v avtomobilski industriji. Radarsko tehniko srečamo tudi v medicini in pri opazovanju sprememb na površju Zemlje.
V tem prispevku bomo opisali ultrazvočni radar bočnega razgleda, ki ga sestavlja ultrazvočni oddajnik in sprejemnik in analogno-digitalna kartica, ki sprejema in generira signale. Prispevek podrobneje opisuje postopek kompresije pulza pravokotno na smer gibanje platforme radarja in kompresijo pulza v smeri gibanja radarja. Postopka uporabimo za t.i. kompresijo oziroma fokusiranje radarskih signalov, ki nam predstavljajo radarsko sliko. Pokazali bomo oceno hitrosti gibanja iz radarskih posnetkov in predstavili model radarja, ki je zmožen zaznati objekte izza sten.

Synthetic Aperture Radar

Speaker: Dr. Dušan Gleich
UM FERI, Institute of Automation

In modern methods of digital signal processing, radar technology always can be found more and more often. It can be found in the navigation and surveillance systems, localization of targets, early detection and warnings for natural disasters and in the automotive industry. Radar technology can also be found in medicine and Earth's observation.
In this paper, we described an ultrasonic radar, which consists of an ultrasonic transmitter and receiver and analog-to-digital converter that receives echoes and generates signals. A pulse compression in range and azimuth direction were presented in detail. Algorithms for focusing radar data are used for presenting radar data, which are 2 dimensional data. The movement measurement of ground moving data will be presented. The presentation will be concluded with the through the wall imaging radar.

11.30 – 12.00
Business Forum

Izboljšave in optimizacija procesnega vodenja industrijskih objektov

Predavatelj: dr. Marjan Golob, dr. Nenad Bolf , dr. Ivan Mohler, dr. Nenad Muškinja
UM FERI, Inštitut za avtomatiko, Univerza v Zagrebu, FKKT

Nadzor, diagnostika in optimizacija procesnih sistemov vodenja je ključnega pomena pri zagotavljanju optimalnega delovanja procesov. Malo industrijskih procesov izkorišča moderno programsko opremo za nadzor kvalitete vodenja in optimizacijo regulatorjev. Razlogi so v pomanjkanju inženirskega znanja in v nedostopnosti zanesljive programske opreme za praktično izvajanje postopkov optimiranja regulacijskih parametrov in nadzora kvalitete posameznih regulacijskih zank. Optimizacija osnovnih in naprednih regulacijskih shem zagotavlja stabilnost procesa in pomembno izboljša ostale regulacijske lastnosti, kar pozitivno vpliva na kvaliteto produkta in energetsko učinkovitost industrijskega objekta.
Predstavljena metoda optimizacije regulacijskih procesov za sprotni nadzor in optimizacijo posameznih regulacijskih zank uporablja razpoložljive zgodovinske procesne podatke in lahko izredno izboljša kakovost vodenja in poslovno učinkovitost industrijskega procesa. Zagotavlja stabilno vodenje procesov, višjo kakovost izdelkov in optimalno delovanje.

Process Control Improvements and Optimization of Industrial Plants

Speaker: dr. Marjan Golob, dr. Nenad Bolf , dr. Ivan Mohler, dr. Nenad Muškinja
UM FERI, Inštitut za avtomatiko, Univerza v Zagrebu, FKKT

Monitoring, diagnosis and optimization of process control systems play a key role in ensuring of the optimal process operation. Very few plants use modern software for control quality monitoring and controller optimization due to absence of engineering knowledge and unavailability of practical and robust process control software for controller performance optimization and control quality monitoring. Optimization of primary and advanced control schemes stabilizes the process and improve the overall control system performance significantly which ultimately has a positive effect on product quality and energy consumption.
Presented process control optimisation method for quick and easy process control performance monitoring optimization using available data from the plant's historian can tremendously improve the control quality and the plant's profit margin. This ensures a more stable process control, higher product quality and optimal operation.

12.00 – 12.30
Business Forum

Predstavitev Odbora za znanost in tehnologijo pri Obrtno-podjetniški zbornici Slovenije (OZS) in partnerjev na sejmu IFAM-INTRONIKA 2016
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14.00 – 14.30
Business Forum

Superračunalnik v mojem žepu
Predavatelj: dr. Domen Verber
UM FERI, Inštitut za informatiko

Visokozmogljivo računalništvo uporabljamo za reševanje kompleksnih problemov. Običajno ga povezujemo s superračunalniki z več milijoni procesnih jeder, ki porabijo megavate električne energije in zasedajo cela nadstropja. Delček teh zmogljivosti je danes mogoče poustvariti tudi na zmogljivejših delovnih postajah in strežnikih. A še vedno so to sistemi z veliko porabo električne energije in veliko potrebnega prostora.
Z razvojem tehnologije in miniaturizacijo računalniških komponent se je visokozmogljivo računalništvo približalo tudi vgrajenim sistemom in mobilnim napravam. Vgrajeni sistemi so vgrajeni v druge naprave in zato ne smejo zasedati veliko prostora. Podobno velja za mobilne naprave, ki jih nosimo s seboj. Prav tako želimo, da je poraba energije pri njih čim manjša.
V prispevku bomo pokazali nekaj primerov uporabe visokozmogljivega računalništva, ki so se pojavili na tržišču v zadnjem času. Podjetje Google je predstavil avtonomno vozilo, ki ga upravlja računalnik z razpoznavo okolice. Na mobilnih napravah so se pojavile aplikacije, ki nudijo uporabniku informacije in druge storitve preko govornega vmesnika. Prav tako se pripravlja velika množica novih aplikacij s področja interneta stvari, ki jim bo visokozmogljivo računalništvo v veliko pomoč.

Supercomputer in my pocket
Speaker: dr. Domen Verber
UM FERI, Institute for Informatics

High-performance computing (HPC) is used to solve complex problems. Normally we associate HPC with supercomputers that consist of millions of processing cores, consume megawatts of electric energy and occupy entire building floors. It is now possible to recreate a small part these computing capabilities also on desktop computers and servers, yet these are still systems with high electric energy consumption and in need of a lot of space.
With the advances of computer technology and with the miniaturization of computer components it has become feasible to perform HPC on embedded systems as well as mobile devices. Embedded systems are devices with incorporated computers. Such computers are usually small and with low power consumption. The same applies also to mobile devices that we carry with us.
In the presentation we are going to show examples of uses of high performance computing, that have recently appeared on the market. Companies, like Google, have introduced autonomous vehicles operated by a computer. New applications have emerged on mobile devices that provide user information and other services via speech interface, etc. In the near future we also expect a great number of new applications in the field of the Internet of Things. For those as well HPC will play a very important role.

14.30 – 15.00
Mini Business Forum

Robot za reševanje Rubikove kocke
Študent: Rok Rabuza
UM FERI, Inštitut za avtomatiko

Robot za reševanje Rubikove kocke je rezultat projekta, ki sem ga razvil in izpopolnjeval v okviru diplomskega in kasneje magistrskega dela. Robot je voden s pomočjo mikroračunalnika Raspberry Pi, na katerem je v Python programskem jeziku narejen program za reševanje Rubikove kocke, ki uporablja prirejeno Fridrichevo metodo za iskanje rešitve. Robot Rubikovo kocko rešuje s pomočjo štirih prijemal, ki jih upravlja z osmimi servomotorji, za komunikacijo med njimi in mikrokrmilnikom pa skrbi gonilnik servomotorjev. Za slikanje kocke je uporabljena PiCamera, priključena na Raspberry Pi, za kakovostno osvetlitev pa poskrbijo bele bleščeče diode. Povprečen čas reševanja Rubikove kocke je 43 sekund, čas posameznih reševanj pa se sproti prikazuje na nadzorni plošči na vrhu robota.

Robot for solving the Rubik's cube
Student: Rok Rabuza

UM FERI, Inštitut za avtomatiko

This robot for solving the Rubik's cube is the result of a project which was developed and perfected during my diploma and later master's degree. The robot is controlled by using a microcomputer Raspberry Pi on which a programme for solving the Rubik's cube is implemented in Python programming language. The programme uses a modified Fridrich method to find the solution. The cube is solved by using four robotic arms driven by eight servo motors connected to a servo driver controlled by the microcomputer. A PiCamera is used for capturing the cube and white LEDs are used for quality lighting. The average solving time is 43 seconds, individual solving times are displayed on a control panel on top of the robot.

15.30 – 16.30
Business Forum

Okrogla miza : Slovenija relativno veliko vlaga v RRD, vendar posledično ni ekvivalentnih rezultatov v gospodarstvu– zakaj?

Moderator : Vida Petrovčič

Round table : Slovenia is investing relatively a lot in R & D, but the consequent economic results are not meeting the expectation of business – why?

17.00 – 20.00
Mini Business Forum

Sprejem za razstavljalcev (samo na povabilo organizatorja ICM d.o.o.)
Reception for Exhibitors (only with invitation from the organizer ICM d.o.o)

28.01.2016 Četrtek / Thursday

10.30 – 11.00
Business Forum

Predstavitev Odbora za znanost in tehnologijo pri Obrtno-podjetniški zbornici Slovenije (OZS) in partnerjev na sejmu IFAM-INTRONIKA 2016
Predavatelj : Janez Škrlec

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Speaker : Janez Škrlec

11.00 – 11.30
Business Forum

Iskanje skritih poškodb v prevodnem materialu in ocena njihove globine
Predavatelj: dr. Marko Jesenik
UM FERI, Laboratorij za Aplikativno elektromagnetiko, Inštitut za Močnostno elektrotehniko

Brez poškodbeno testiranje materialov se vse bolj razvija. Ena izmed mnogih metod je tudi brez poškodbeno testiranje z vrtinčnimi tokovi, ki se lahko uporablja kadar testiramo prevodne materiale. Ob material postavimo tuljavo napajano z izmeničnim tokom, zaradi česar se v materialu inducirajo vrtinčni tokovi in vplivajo na gostoto magnetnega pretoka ob materialu, ki jo lahko merimo. V področju poškodbe je gostota magnetnega pretoka spremenjena zaradi prisotnosti poškodbe, kjer vrtinčni tokovi ne morejo teči. Dobljena merjena gostota magnetnega pretoka nam razen informacije o prisotnosti poškodbe omogoča tudi oceno velikosti poškodbe.

Search for hidden crack and estimation of their depths
Speaker: dr. Marko Jesenik
UM FERI, Applied Electromagnetics Laboratory, Institute of Power Engineering

Non-destructive testing of the materials is more and more developed. One of many methods is also eddy current non-destructive testing, which can be used for testing of conductive materials. Excitation coil is placed near the surface of the material and it is supplied with alternating current, because of that eddy currents are induced in the material and they influence magnetic flux density near the material, which can be measured. In the surroundings of the material's damage magnetic flux density is changed due to damage, because eddy currents can't flow in the damaged area. Obtained measured magnetic flux density gives us information about damage presence and also estimation of damage's dimensions can be done.

11.30 – 12.00
Business Forum

Tiskanje v tretjo dimenzijo : Izdelava tiskalnika 3D

Predavatelj: Lovro Brdnik
UM FERI, Inštitut za močnostno elektrotehniko

Industrija že dolgo narekuje smer razvoja in potrebe, ki temu razvoju sledijo. Zaradi vse bolj zahtevnih rokov in potrebe po hitro izdelanih prototipih se je v poznih 1980-ih pričel razvoj aditivne tehnologije. Aditivna tehnologija je omogočila hitri obrat CAD modelov v prototipe, ki jih lahko skupina inženirjev prime v roko, preuči in odloči, kje oziroma če so potrebni popravki pred proizvodnjo.
Aditivno tehnologijo velikokrat zmotno enačijo s CNC tehnologijo. Razlika je, da CNC proces odstranjuje material od modela, medtem ko aditivna tehnologija dodaja material.
Tehnologija se je razvila iz brizgalnih tiskalnikov z razliko, da tiskajo še v višino. Tehnologija se konstanto razvija in teži k temu, da postopek ne bo več uporabljen samo za hitro izdelavo prototipov, ampak tudi za proizvodnjo

Printing into the third dimension: Construction of a 3D printer

Speaker: Lovro Brdnik
UM FERI, Inštitut za močnostno elektrotehniko

The Industry dictates the direction and development of technology. Due to the increasingly demanding deadlines and the need to rapidly prototype in the late 1980s started the development of additive technology. Additive technology has enabled the rapid establishment of CAD models into prototypes that can be examined by a group of engineers with their hands, consider and decide whether it is necessary to fix a part prior to production.
Additive technology is often mistakenly equated with CNC technology. The difference is that the CNC process removes material from the model, while the additive technology adds material. Technology has evolved from inkjet printers with the difference that 3D printing is stacking layers. Technology is evolving and is developing constantly to the fact that the procedure will no longer only used for rapid prototyping, but also for production.

12.00 – 12.30
Business Forum

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Speaker : Janez Škrlec

14.00 – 14.30
Business Forum

Razporejanje proizvodnje v energetiki z diferencialno evolucijo in omejitvami

Predavatelj: doc. dr. Aleš Zamuda
UM FERI, Inštitut za računalništvo

V sklopu predavanja bo predstavljen nov pristop za optimizacijo razporejanja proizvodnje električne energije med hidroelektrarnami in termoelektrarnami. Pristop omogoča hitrejši izračun kot je to bilo možno do sedaj. To je mogoče, saj pristop predstavi pred-izračunan nadomestni model, ki se med optimizacijo celotnega optimiziranega modela hidro in termo enot ne spreminja in hrani dobljene vrednosti parametrov nadomestnega modela v praktično uporabni natačnosti. Rezultati tega problema razporejanja na uveljavljenih testih iz literature kažejo večjo izboljšavo na vseh scenarijih in vseh kriterijih v primerjavi z do sedaj znanimi pristopi. Dva algoritma sta izdelana v tem pristopu: prvi algoritem (NPdynεjDE) naslavlja posebno obravnavo omejitev in optimizira razporejanje za termoelektrarne; drugi algoritem (PSADEs) uporabi rezultate prvega algoritma, da optimizira skupno proizvodnjo s hidro elektrarnami, pri tem pa oba uporabita praktično natančnost parametrov za urnik obremenitev termoelektrarn. Novost prispeva k razvoju algoritmov z namenom, izboljšati učinkovitost produkcije električne energije in zmanjšanja izpustov ter ogljičnega odtisa, s hkratno zadovoljitvijo 24-urnih sistemskih zahtev v razporejanju povpraševane energije ter vseh operativnih zahtev. Nov pristop je bil predstavljen tudi v mednarodnem revijalnem znanstvenem prispevku: A. Glotić, A. Zamuda. Short-term combined economic and emission hydrothermal optimization by surrogate differential evolution. Applied Energy, 1 March 2015, letn. 141, str. 42-56. DOI 10.1016/j.apenergy.2014.12.020.

Production scheduling in energetics using differential evolution and constraints

Speaker: asst. prof. dr. Aleš Zamuda

UM FERI, Institute for computer science

A new approach for electrical energy production optimization by scheduling production among hydro and thermal power plants will be presented in the lecture. The approach enables a faster computation than available before due to the pre-computed off-line surrogate model, which stores practical precision parameter results for on-line optimization. The results of the scheduling on the model tested show improvements in all scenarios and all criteria, compared to the existing approaches. These findings are published in the prestigious journal Applied Energy. Two algorithms are designed for this: the first algorithm (NPdynɛjDE) addresses the special constraint handling for thermal hourly production, then the second algorithm (PSADEs) uses its results to optimize combined production with hydro units using practical precision parameters for the thermal units hourly schedules. Both algorithms are based on differential evolution, which has most prominent applications in the electrical and power systems when applied to engineering optimization problems. This contributes to the algorithm development with aim to improve production efficiency and reduce the carbon footprint of its emission while satisfying 24-hour system demand and all operation requirements. The paper was published in the highly ranked scientific journal: A. Glotić, A. Zamuda. Short-term combined economic and emission hydrothermal optimization by surrogate differential evolution. Applied Energy, 1 March 2015, vol. 141, pp. 42-56. DOI 10.1016/j.apenergy.2014.12.020.

14.30 – 15.00
Mini Business Forum

Grafični vmesnik Matlab-a kot pomoč pri preučevanju električnega polja

Predavatelj: Tadej Kesak, mag. inž. el.

UM FERI, Inštitut za močnostno elektrotehniko

Cilj raziskovalnega dela je bil modelirati različne modele elektrod s pomočjo programskega orodja Matlab. Z ustvarjenimi modeli so bili v programskem orodju EleFAnT izvedeni izračuni električne poljske jakost, kar omogoča preučitev vpliva elektrod na homogeno in nehomogeno električno polje. Za potrditev dobljenih rezultatov s programskim orodjem so bili izvedeli eksperimentalni preskusi in meritve preskočnih napetosti v visokonapetostnem laboratoriju ICEM (Infrastrukturni center za energetske meritve).
Za lažje spreminjanje vseh parametrov pri izračunu, ter lažji pregled rezultatov je bil izdelan Matlab GUI (ang. graphical user interface) model oz. Matlab grafični vmesnik. Ta vmesnik uporabniku omogoča prijazno in enostavno orodje, za preučitev električnega polja.

Matlab graphical user interface as an aid in the study of electric field

Speaker: Tadej Kesak, mag. inž. el.

UM FERI, Inštitut za močnostno elektrotehniko

The aim of the research work was modelling different designs of electrodes using MATLAB. With the created models, calculations of electric field strength were made with the programming tool EleFAnT, which allows examination of the impact of the electrodes to a homogenous and inhomogeneous electric field. To confirm the results obtained with the software, experimental tests and measurements of interlaced voltage were made in high-voltage laboratory ICEM.
For easier change of all the parameters for the calculations and easy overview of the results, a graphical user interface was made with the help of Matlab GUI. This interface allows a user-friendly and easy to use tool to study electric fields.

15.30 – 16.00
Business Forum

Predstavitev Odbora za znanost in tehnologijo pri Obrtno-podjetniški zbornici Slovenije (OZS) in partnerjev na sejmu IFAM-INTRONIKA 2016

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Presentation of the Committee on Science and Technology at the Chamber of Crafts of Slovenia (OZS) and partners at the Fair IFAM-INTRONIKA 2016

Speaker : Janez Škrlec

29.01.2016 Petek / Friday

10.30 – 11.00
Business Forum

Predstavitev Odbora za znanost in tehnologijo pri Obrtno-podjetniški zbornici Slovenije (OZS) in partnerjev na sejmu IFAM-INTRONIKA 2016

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11.00 – 11.30

Business Forum

Možnosti, ki jih ponuja 3-dimenzionalni zajem Slovenije za njen razvoj

Predavatelj: mag. Robi Cvirn UM FERI, Inštitut za računalništvo

Širši pogled na možnosti razvoja s pomočjo visoko-ločljivostnega 3D zemljevida Slovenije, kateri je bil posnel med letoma 2011 in 2015. Snemanje je bilo opravljeno iz manjšega letala s tehnologijo LiDAR, ki omogoča natančen 3D točkovni zajem površja zemlje. Posneti 3D zemljevid oziroma podatki so prosto dostopni širši javnosti od 26.11.2015 dalje. Posnetke si je možno ogledati in prenesti na spletnem naslovu http://gis.arso.gov.si/evode/ v kategoriji LiDAR.

Possibilities offered by 3-dimensional capture of Slovenia for its development

Speaker: mag. Robi Cvirn

UM FERI, Institute for computer science

A wider look at the development possibilities with the help of high resolution 3D map of Slovenia, which was recorded between the years 2011 and 2015. The recording was made from a small airplane with LiDAR technology, which enables an accurate 3D point capture of the Earth's surface.

The recorded data is freely available to the wider public from 26.11.2015 onward. The data can be view and downloaded from http://gis.arso.gov.si/evode/ in the category LiDAR.

11.30 – 12.00

Business Forum

Vakuumski reaktor za sušenje komunalnega mulja

Predavatelj: dr. Božidar Bratina, dr. Riko Šafarič

UM FERI, Laboratorij za kognitivne sisteme v mehatroniki, Inštitut za robotiko

V skladu z veljavno zakonodajo RS po 15. juliju 2009 ni več dovoljeno odlagati neobdelanih muljev iz komunalnih čistilnih naprav na odlagališča nenevarnih odpadkov. Številne čistilne naprave, ki so v zadnjem desetletju zrasle po Sloveniji v obliki EU sofinanciranja, so izpostavile problematiko povečevanja količine mulja. Trenutne rešitve mešanja muljev s pepelom (prekrivni material), zakopavanje, sežig , izvoz v tujino itd, so z novimi smernicami EU krožnega gospodarstva oz. snovnega toka nezaželene zato se vzpodbuja razvoj tehnologij za ponovno izrabo mulja v industriji, energetiki ali kmetijstvu. Komunalni mulj je tako energetsko kot snovno zanimiv, ima kurilno vrednost lignita in je bogat s fosforjem (poceni fosfornih mineralov za potrebe gnojil bo v svetovnem merilu zmanjkalo v 20-30 letih), dušikom, kalijem, ki so osnovna sestavina današnjih umetnih gnojil. Oviro predstavlja delež vode (75-90%) v mulju na izhodu čistilnih naprav, kar zahteva sušenje mulja, ter morebitna onesnaženost s težkimi kovinami. V tem trenutku se v Sloveniji že vpeljujejo rešitve sušenja mulja v okviru čistilnih naprav, a z drago in uvoženo tehnologijo ob visokih temperaturah sušilnega medija. V skupnem projektu Univerze v Mariboru in podjetja Surovina d.o.o. iz Maribora je bil razvit vakuumski reaktor za sušenje muljev. Le-ta deluje v grobem vakuumu in v nizko temperaturnem režimu (40°C) omogoča sušenje nestabiliziranih komunalnih (ali industrijskih) muljev z različnimi stopnjami vlage, do želenega produkta s 40% vlage, ki je primeren za gnojilo oziroma z 10% vlage, ki je primeren kot alternativno gorivo. Med postopkom sušenja zaradi uporabljene tehnologije vakuumskega sušenja ni emisij smradu v okolico.

Vacuum reactor for municipal sludge drying

Speaker: dr. Božidar Bratina, dr. Riko Šafarič

UM FERI, Laboratory for cognitive systems in mechatronics, Institute of Robotics

In accordance with the legislation of RS, after 15 July 2009 municipal sludge from sewage treatment plants can no longer be freely disposed as non-hazardous waste. Many wastewater treatment plants, which were built in the last decade in Slovenia with the support of EU co-financing, raised the issue of increasing amounts of municipal sludge. Current technologies for sludge removal are mixing sludge with ash (cover material), burying, incineration, export etc, whereas new guidelines of the EU are towards circular economy or in other words the re-use of sludge in the industry, for energy or agriculture use. Municipal sludge has calorific value such as lignite and is rich with phosphorous (world supplies of phosphorous mineral are supposed to run out in 20-30 years),

nitrogen, potassium, which are the core components of today's artificial fertilizers. The main problem of municipal sludge presents the amount of water (75-90%) hence sludge requires drying, and possible contamination with heavy metals. At the moment technologies for sludge drying in Slovenia are mostly expensive imported technologies working with high temperature drying medium. In the scope of the joint project of the University of Maribor and company Surovina d.o.o. a vacuum reactor for sludge drying was developed. The reactor works under vacuum and with low temperature heating medium (40°C) which allows drying of un-stabilized municipal (or industrial) sludge with different levels of humidity; 40% of water is suitable for fertilizer, or 10% of water suitable as an alternative fuel. During the drying process there are no emissions into the environment, due to the vacuum technology used.

12.00 – 12.30
Business Forum

Predstavitev Odbora za znanost in tehnologijo pri Obrtno-podjetniški zbornici Slovenije (OZS) in partnerjev na sejmu IFAM-INTRONIKA 2016
Predavatelj : Janez Škrlec

Presentation of the Committee on Science and Technology at the Chamber of Crafts of Slovenia (OZS) and partners at the Fair IFAM-INTRONIKA 2016
Speaker : Janez Škrlec

14.00 – 14.30
Business Forum

Dostopnost produktov in storitev za osebe s posebnimi potrebami
Predavatelj: dr. Matjaž Debevc
UM FERI, Inštitut za medijske komunikacije

Hiter razvoj informacijske in komunikacije tehnologije je prinesel s seboj tudi možnosti za enostavnejše in uspešnejše vključevanje oseb s posebnimi potrebami v izobraževalno, družbeno in delovno okolje. S pomočjo tehnologij invalidnost ni in tudi ne sme biti več ovira, temveč tehnologije postanejo pripomoček za polno vključitev oseb s posebnimi potrebami v družbo. Tega se zaveda tudi Evropska komisija, ki je v ta namen podala predlog Evropskega zakona o dostopnosti. Tako smo sedaj prišli v obdobje, ko bo potrebno urediti dostopnost produktov in storitev za vse udeležence.
Zaradi lažjega uvajanja dostopnosti za produkte in storitve, še posebej storitev javnega značaja, je tako nujno potrebno dobro poznavanje zahtev in potreb oseb s posebnimi potrebami ter poznavanje ustrezne uporabe informacijske in komunikacijske tehnologije zanje. Na voljo so tudi različni evropski standardi, določila in zakoni, ki nudijo smernice in direktive za razvoj dostopnih produktov in storitev. Vse to skupaj dajejo tudi nove poslovne priložnosti za podjetja, ki bodo lahko s tem našle tudi možnosti za ponudbo dostopnih produktov in možnosti za učinkovitejše vključevanje oseb s posebnimi potrebami v delovno okolje.

Accessibility of products and services to the disabled persons
Speaker: dr. Matjaž Debevc
UM FERI, Institute of media communications

The rapid development of information and communication technology has brought a potential for easier and more effective integration of disabled persons in educational, social and working environment. With the help of technology disability is no longer a barrier, but technologies become a tool for the full integration of disabled persons in society. With this in mind the European Commission proposed European Accessibility Act. We are now in the phase where it is necessary to regulate the accessibility of products and services for all participants.
In order to facilitate the availability of accessible products and services, especially services of public character, it is necessary to have a good knowledge of the requirements and needs of disabled persons and knowledge of the appropriate use of information and communication technologies to them. There are also different standards, provisions and laws that provide guidelines and directives for the development of accessible products and services. All this together provide new business opportunities for companies to find the possibilities for offering affordable products and opportunities which will enable more effective integration of disabled people into the workplace

14.30 – 15.00
Mini Business Forum

Umetni športni trener
Predavatelj: Iztok Fister Jr., mag. inž. rač. in inf. tehnol.
UM FERI, Inštitut za računalništvo

Namen umetnega športnega trenerja je posnemanje človeškega osebnega trenerja. Umetni športni trener deluje na osnovi algoritmov računske inteligence (računska inteligenca je podveja umetne inteligence) in je sposoben avtomatskega generiranja športnih treningov, detekcije pretreniranosti tekmovalca, izogibanja poškodb, generiranja trening poti, predikcije hrane in še veliko več. Umetni športni trener lahko odkrije različne navade športnikov, ki jih npr. človek ne odkrije ter jih prikaže v enostavni obliki, ki je razumljiva komerkoli. Umetni športni trener je primeren tako amaterjem kot tudi profesionalcem. Primeren je tudi športnim trenerjem katerim lahko z nasveti pomaga k še boljši pripravi tekmovalca.

Artificial sport trainer

Speaker: Iztok Fister Jr., mag. inž. rač. in inf. tehnol.
UM FERI, Institute for computer science

The aim of artificial sport trainer is to mimic human personal trainer. Artificial sport trainer (AST) bases on computational intelligence (sub-branch of artificial intelligence) algorithms and is capable to automatically generate training sessions, detect overtraining, prevent injuries, generate courses (maps), predict food for eating, show hidden athlete's habits which are not visible to trainers and to show the results in nice form which is easy for interpretation. Artificial sport trainer is proper for amateur and professional athletes. It is also very useful for human sport trainers who may be helped by the suggestions from artificial sport trainer.

15.30 – 16.00
Business Forum

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