

<b>11.02.2020 Torek / Tuesday</b>		<b>Predavalnica OJSTRICA</b>
Čas/Time Jezik/Language	Naziv predavanja /Topic Predavatelj / Speaker	
<b>10.30 - 11.00</b>	<b>International Federation of Robotics World Robotics 2019 - Industrial Robots</b> Zlatko Katalenić, u.d.i.s. consultant for robotics	
<b>11.00 - 11.30</b> slovenščina 	<b>DEPRAG E-SFM – električna podajna vijačna enota</b> Andraž Potočnik, MB Naklo d.o.o.  DEPRAG je vodilno podjetje na področju tehnologije vijačenja. Depragova nova funkcijska enota za vijačenje z elektronskim krmiljenjem (E-SFM) je optimalno zasnovana za prilagodljivo izvajanje zapletenih nalog vijačenja in različne zahteve pri sestavljanju. Na voljo so različne izvedbe, s katerimi so izvedljivi procesi vijačenja za še tako zahtevne aplikacije. Enoto je mogoče na sejmu IFAM 2020 tudi preizkusiti.	
<b>11.30 - 12.00</b> slovenščina 	<b>Predstavitev in uporaba Igusovih spletnih orodij</b> Jože Zabret, Hennlich d.o.o. Matic Butja, Hennlich d.o.o.  V podjetju Igu so razvili spletna orodja, ki temeljijo na več desetletnih izkušnjah in testiranjih njihovih izdelkov. Predstavili bomo, kje in kako se lahko uporablja ta Iguova spletna orodja. Na spletni strani igus.si so na voljo različni kalkulatorji s katerimi lahko za celoten Iguov sortiment določimo in izberemo pravilne rešitve za svoje aplikacije. Z Iguovimi spletnimi orodji si pomagamo pri pravilni izbiri:	

<b>11.02.2020 Torek / Tuesday</b>		<b>Predavalnica ŠIPKA</b>
Čas/Time Jezik/Language	Naziv predavanja /Topic Predavatelj / Speaker	
<b>11.00 - 12.30</b>	<b>Okrogla miza</b> <b>Umetna inteligenca – robotika – avtomatizacija, izzivi za naslednje desetletje</b>  <b>Aleksandar Rodić</b> , znanstveni svetovalec, podpredsednik Skupščine inštituta Institut Mihajlo Pupin, Beograd <b>Andrej Rotovnik</b> , direktor podjetja MIEL, Velenje <b>Erih Arko</b> , vodja razvoja YASKAWA, Kočevje <b>Franc Žaberl</b> , tehnični direktor FANUC, Celje <b>Sašo Džeroski</b> , predsednik Društva umetne inteligence Slovenije, Institut Jožef Stefan, Ljubljana  <b>Moderator: Vida Petrovčič</b>	



- energijskih verig,
- fleksibilnih kablov,
- konfekcioniranih energijskih verig,
- polimernih ležajev,
- sferičnih ležajev,
- linearnih vodil in vozičkov,
- polimernih krogličnih ležajev,
- robotinkov – cenovno ugodnih robotov.

V spletno orodje vnesemo robne pogoje in pogoje delovnega okolja. Na osnovi teh podatkov sistem ponudi primerno rešitev skupaj s podatkom o predvideni življenjski dobi. Sistem glede na navedene pogoje (temperatura, obremenitev) npr. za puše in ležaje izbere primeren material. Pri energijskih verigah pa sistem odvisno od teže polnitve verige, hitrosti ali okoljskih pogojev predlaga primerno dimenzijo in tip energijske verige.

**12.00 - 12.30**

English



### **MECHATRONIC AND ROBOTIC SYSTEMS WITH FLUID POWER DRIVES**

**prof. dr. sc. Željko Šitum**

**Sveučilište u Zagrebu, Fakultet strojarstva i brodogradnje**

The presentation shows a number of self-made experimental systems with hydraulic and pneumatic drives that have been designed as test models in the field of fluid power systems, mechatronic and robotic systems and for the educational process of mechanical engineering students within the scope of automatic systems control.


Some of the experimental systems that will be introduced in the presentation are:

- Hydraulic systems: the system for translational motion control, the system for rotational motion control, the system for control of force,
- Pneumatic systems: position control of pneumatic cylinder using proportional control valve, proportional

	<p>pressure valves, on/off solenoid valves and matrix valves, pneumatic crankshaft mechanism, pneumatic press,</p> <ul style="list-style-type: none"> <li>▪ Mechatronic balancing mechanisms: inverted pendulum system, inverted wedge system, ball on beam system, ball on plate system, ball on wheel system,</li> <li>▪ Robotic systems: electro-hydraulic robotic manipulator, electro-pneumatic robotic manipulator, manipulator driven by pneumatic artificial muscles, autonomous vehicle driven by PAMs,</li> <li>▪ Bionic systems: four-legged walking robot actuated by PAMs, ankle-foot orthosis actuated by PAM, exoskeleton hand.</li> </ul>
<p><b>12.30 – 14.00</b> slovenščina</p>	<p><b>Okrogla miza - Razvojne perspektive elektroindustrije v Sloveniji in regiji</b></p> <p>Dvig dodane vrednosti proizvodom elektroindustrije (nove tehnologije, novi poslovni modeli, novi trg) Položaj slovenske elektroindustrije na slovenskem trgu oziroma v regiji (uvoz poceni proizvodov, prestrukturiranje družinskih podjetij, prevzemi tujih lastnikov) Vključenost slovenske elektroindustrije v evropske trende poslovnega vzpona industrije (vizija EU industrije 2030)</p> <p style="text-align: center;"><b>Boštjan Gorjup</b>, predsednik GZS <b>Branko Meh</b>, predsednik OZS <b>mag. Matjaž Čemažar</b>, predsednik uprave Domel Holding d.d. <b>Janez Novak</b>, direktor RLS d.o.o. <b>Luka Mustafa</b>, direktor Fabrikor d.o.o. <b>mag. Aleš Cantarutti</b>, državni sekretar, MGRT <b>prof.dr. Gregor Dolinar</b>, dekan, Fakulteta za elektrotehniko UL <b>Moderator: dr. Marjan Rihar</b> direktor Zbornice elektronske in elektroindustrije GZS</p>

<b>12.02.2020 Sreda / Wednesday</b> Predavalnica OJSTRICA	
Čas/Time Jezik/Language	Naziv predavanja /Topic Predavatelj / Speaker
<b>9.30 – 10.15</b> English	<b>High power on PCB: HE-Y, HE-S relays</b> Walter Kloss ,Panasonic electric works EU AG v sodelovanju z IC elektroniko d.o.o.
<b>10.15 – 11.00</b> English	<b>UV LED</b> Lorenz Bauer , LITE-ON OPTO ELECTRONICS LTD AG v sodelovanju z IC elektroniko d.o.o.

<b>12.02.2020 Sreda / Wednesday</b> Predavalnica Šipka	
Čas/Time Jezik/Language	Naziv predavanja /Topic Predavatelj / Speaker
<b>Seminar: AI for Industry and Society</b>	
<b>10.00 – 10.30</b> English	<b>Artificial Intelligence: Techniques, Trends and Applications</b> dr. Marko Robnik Šikonja Institut Jožef Stefan
	The area of artificial intelligence is rapidly progressing, and deep neural networks are superseding many of the traditional approaches. We have seen impressive advances and super-human performance in image and video processing, natural language understanding, semantic search, speech processing, and game playing. While current state-of-the-art is far from artificial general intelligence, new capabilities are already changing both industry and public sector. We will glimpse into recent trends in artificial intelligence and its inspiring applications.
<b>10.30 - 11.00</b> English	<b>Data Science, Machine Learning and Big Data: Current trends</b> dr. Nada Lavrač Institut Jožef Stefan
	Machine Learning is one of the most flourishing areas of computer science. Traditionally, machine learning was concerned with the discovery of models, patterns, and other regularities in data stored in single data tables.

			<p>Machine learning research gained additional momentum with the advent of big data, resulting in the need of analyzing huge amounts of data gathered in structured relational databases, unstructured texts and images, heterogeneous data formats as well as data streams. This lecture outlines some of the current trends in this research area, recently named data science.</p>
<p><b>11.00 - 11.30</b> slovenščina</p>	<p><b>Manipuliranje z mehкими obdelovanci v proizvodnji – primer manipuliranja z gospodinjskimi spužvami</b> <b>Tim Vrbančič, INEA RBT</b></p> <p>Prezentacija opisuje avtomatizacijo procesa manipulacije gospodinjskih spužev za pripravo na pakiranje. Za razliko od stabilnih obdelovancev se gospodinjska spužva zaradi svojih lastnosti (majhna teža, hrapavost in prožnost materiala) v procesih manipulacije izkaže za »zahteven« obdelovalni kos. Spužva se poleg majhnega trenja v nekaterih situacijah obnaša kot vzmet, kar od celotnega procesa zahteva mehansko izpopolnjenost stroja in »uglašenos« s pogoni. Manipulacija obdelovancev obsega združevanje večjega števila razrezanih gobic, sortiranje in ponovno združevanje v zelene kombinacije. Vse to omogoča kompleksna linija, sestavljena iz transportnih trakov, usmerjevalnih vodil, senzorjev, pnevmatskih cilindrov, sinhrono gnanih pogonov ter drugih komponent. Praktično bosta predstavljeni dve sortirni liniji, kateri je izdelalo podjetje INEA RBT d.o.o.</p>	<p><b>11.00 - 11.30</b> English</p> 	<p><b>Data Science with the OrangeToolbox</b> <b>dr. Blaž Zupan</b> <b>Institut Jožef Stefan</b></p> <p>With data everywhere around us, the data science is too instrumental and with far-reaching consequences to be reserved for only a few enlightened ones. I will present Orange Data Mining, a toolbox where anybody can do data science after a bit of training. While Orange found many uses in academia and industry, I will expose its role in the democratization of data science and as a training tool.</p>

11.30 - 12.00  
slovenščina



**Povečanje zanesljivosti napajalnih sistemov z daljinskim spremljanjem napajalnih naprav**

**Ladislav Kolednik**  
**vodja programa Sistemi za energetiko**  
**Kolektor Sisteh d.o.o.**

Sistemi za neprekinjeno napajanje kritične infrastrukture so bistvenega pomena v številnih podjetjih in organizacijah. Na tržišču ima vsak dobavitelj UPS naprav svojo aplikacijo, ki lahko povezujejo UPS naprave v omrežje za nadzor in obveščanje. Vendar te aplikacije so »zaprte« in večinoma ne sprejemajo naprav drugih proizvajalcev, kot tudi ne podpirajo najbolj pogostih industrijskih komunikacijskih protokolov, s tem pa ne podpirajo v isti sistem integracije DEA agregatov in drugih pomembnih spremljevalnih naprav. V podjetju Kolektor Sisteh d.o.o. smo zasnovali nadzorno aplikacijo, ki odpravlja omenjene pomanjkljivosti in naj bi v prvi vrsti olajšala upravljalcem naprav biti v realnem času obveščen o vseh dogodkih in stanju različnih naprav ter s tem bistveno zvišala pričakovano razpoložljivost. Aplikacija je zasnovana kot »pametna aplikacija« in je sposobna prepoznavati trenutno stanje naprave in vgrajenih komponent. Tako lahko uporabnik v vsakem trenutku ve trenutno zdravje naprave in pravočasno planira določene stroške povezane z napravo. S tem se bo bistveno povečala razpoložljivost napajanja. Članek govori o celoviti rešitvi, ki smo jo zasnovali na podlagi naših izkušenj in realnih potreb, ki prihajajo iz »terena« in ki je dobra osnova, za boljše in celovitejše obvladovanje naprav in opreme v strukturi elektroenergetskega napajanja objektov, sistemov, proizvodnih procesov ali infrastrukture.

11.30 - 12.00  
English




**Decision Support: The DEXi Toolbox and its Applications**

**Dr. Marko Bohanec**  
**Institut Jožef Stefan**

Decision Support is a discipline concerned with human decision making: it aims to provide methods and tools that support, rather than replace, people in making difficult decisions. One of the widely used decision-support approaches relies on decision models, which are developed in the decision process and used to evaluate and analyse decision alternatives. In this lecture, we shall present the method DEX (Decision EXpert), which was heavily influenced by ideas from Artificial Intelligence. DEX is a hierarchical, qualitative, rule-based, multi-criteria modelling method, suitable particularly for solving classification decision problems. DEX combines traditional approaches with those from expert systems and machine learning. DEX is supported by the software called DEXi and has been used in hundreds of real-world decision-making studies. The presentation will be illustrated by recent applications in the areas of electric energy production, food safety and health care.

<p><b>12.00 - 12.30</b> slovenščina English</p> 	<p><b>Manipulator 3arm® M5 - učinkovita ročna naprava za varno manipulacijo bremen</b> Andraž Potočnik, MB-NAKLO Jordi Lopez, TecnoSpiro</p> <p>Ergonomske roke 3arm® M5 so najmočnejše in najbolj zanesljive ročno upravljane roke na svetovnem trgu za manipulacijo bremen do 50 kg. Možna je uporaba čeljusti, vakuuma, magneta ali po meri. M5 predstavlja pravo rešitev pri zagotavljanju varnosti in zdravja zaposlenih pri delu ter pri doseganju visoke produktivnosti in učinkovitosti. Napravo je mogoče na sejmu IFAM 2020 tudi v živo preizkusiti.</p>	<p><b>12.15 – 12.45</b> English</p> 	<p><b>Text Mining Applications for Industry</b> dr. Dunja Mladenić Institut Jožef Stefan</p> <p>Artificial Intelligence, machine learning and text mining technologies are gradually changing our working environments. <i>Science</i> recently published a paper “<i>What can machine learning do? Workforce implications</i>” with insights of an extensive study discussing how machines can automate some tasks and augment human capabilities to make possible entirely new products and services. Moreover, a related study published in <i>Nature</i> a couple of year ago points out the need for monitoring how technology is transforming work, showing a growth of productivity in USA industry over 30 years and reduction of a need for routine clerical work. Text mining and data analysis offer very practical support for a number of applications including media industry, marketing and communication analysis.</p>
<p><b>12.30 - 13.00</b> Slovenščina</p> 	<p><b>Aplikacije industrijskih robotov FANUC za manipulacijo in obločno varjenje</b> Franc Žaberl tehnični direktor podjetja FANUC</p>	<p><b>12.45 - 13.15</b> English</p> 	<p><b>AI Applications in Agriculture</b> dr. Aneta Trajanov Institut Jožef Stefan</p> <p>Agriculture is facing many challenges in order to fulfil the sustainable development goals to provide healthy food, clean environment and protect the biodiversity. This requires solving complex decision-making problems in agriculture. With the introduction of IT technologies and digitalization of the agriculture, there are massive amounts of agricultural data produced daily. Therefore, AI is becoming more and more needed for analysis of</p>

			<p>agricultural data and providing solutions for the challenges it is facing. In this talk, we will present some practical AI applications and solutions in different areas of agriculture.</p>
<p><b>13.00 - 14.30</b> English</p>	<p><b>Plantfloor Communication Trends for The Industry 4.0 (Komunikacijski trendi v proizvodnjah za Industrijo 4.0)</b> <b>Hector Garcia</b> <b>Kepware, PTC</b></p> <p>V času pospešene digitalizacije se z IT nivojem proizvodnih podjetij ne povezujejo le industrijski krmilniki, temveč tudi CNC stroji, stroji za brizganje plastike in tudi starejše »brownfield« naprave. Pojavljajo se hibridne komunikacijske strukture, ki poleg nujne povezave med OT in IT nivojem vključujejo prenos in obdelavo podatkov v oblaku ter potrebo po EDGE Computing-u. IT oddelki zahtevajo podatke iz PLK krmilnikov, senzorjev, pogonov, robotov in podobnih naprav (OT nivo). Predstavljen bo nabor gonilnikov platforme KEPServerEX za najrazličnejše stroje (CNC, brizgalne stroje in »brownfield« aplikacije), praktično bo predstavljen API konfiguracijski vmesnik za enostavno povezljivost OT in IT nivoja. Govora bo tudi o varnostnih vprašanjih, saj z novimi komunikacijskimi potmi nastajajo nova tveganja.</p> <p>Za konec bo predstavljen praktičen primer pridobivanja podatkov iz industrijske naprave v oblak Azure preko MQTT protokola ter uporaba API konfiguracijskega vmesnika za enostavno konfiguriranje komunikacije med OT in IT nivojem.</p>	<p><b>13.15 - 13.45</b> English</p> 	<p><b>AI Applications in Medicine and Pharma</b> <b>dr. Sašo Džeroski</b> <b>Institut Jožef Stefan</b></p> <p>One of the first and most significant early uses of artificial intelligence was in the area of medicine, involving the diagnosis of and recommending treatment for severe bacterial infections. Today, the applications of AI in medicine and healthcare are many and varied. AI, and in particular machine learning, is being used to provide help in diagnosis, personalized medicine, and drug development. This talk will give some examples of AI applications in medicine and pharma and outline some recent trends in this area.</p>





		<p><b>13.45 - 14.15</b> English</p> 	<p><b>AI Applications in Manufacturing</b> <b>dr. Bogdan Filipič</b> <b>Institut Jožef Stefan</b></p> <p>Artificial Intelligence (AI) is a key component of Industry 4.0 needed for dealing with excessive amounts of data and enabling autonomy and flexibility in emerging smart production environments. A particular challenge for AI systems in this context is to utilize the closely related tasks of optimization and decision-making. Their importance arises from the fact that many real-world optimization problems include multiple, often conflicting objectives. We will present examples of industrial applications of AI in engineering design, optimization of a manufacturing process and product quality control.</p>
<p><b>14.30 – 15.00</b> English</p> 	<p><b>Red Pitaya – a powerful and versatile development board</b> <b>Nicu Irimia</b> <b>Red Pitaya</b></p> <p>Red Pitaya is an open-source-software measurement and control tool that consists of easy-to-use visual programming software and free of charge, ready-to-use open-source, web-based test, and measurement instruments running on a powerful, credit card-sized board. With a single click, the board can transform into a web-based oscilloscope, spectrum analyzer, signal generator, LCR meter, Bode analyzer, or one of many other applications. Red Pitaya can be controlled by using Matlab, LabView, Python &amp; Scilab.</p>	<p><b>14.30 – 16.30</b></p>	<p><b>10 minute presentations of companies</b></p> <p><b>Bias Variance Labs (BVLabs), Dragi Kocev</b> BVLabs facilitates the data-to-discovery process by focusing on cutting-edge approaches from artificial intelligence and data science. More specifically, BVLabs provides state-of-the-art solutions that address all aspects of the data life cycle, which include data storage, data stewardship, data and knowledge representation, machine learning and visualization. The application domains include healthcare, medicine, ecology and engineering, with special focus on space operations.</p> <p><b>Solvesall d.o.o., Luka Bradeško (CEO)</b> Hardware and Software solutions with integrated AI capabilities with focus on Mobility and IoT. Currently our products are: integrated software and hardware platform with mobile applications for</p>

			<p>recreational vehicle control and monitoring, data management API for public bus operators, and services for personal mobility patterns analytics.</p> <p><b>Event Registry d.o.o., Gregor Leban (CEO)</b> Event Registry collects and analyzes news content published globally in 40 different languages. It uses AI to detect world events and extract from the news content information about what happened, where, who was involved in the event and other relevant event information. The information is used by banks, hedge funds and geopolitical organizations to monitor current and past events.</p> <p><b>Qlector Ltd. Blaž Fortuna (CEO), Tomaž Šuklje (Head of Business Development)</b> QLECTOR is utilizing artificial intelligence to help manufacturing companies walk the line between inventory and delays. Our product QLECTOR LEAP acts as 'google maps' for manufacturing companies - forecasting realization and suggesting alternatives during unplanned events.</p> <p><b>ZEMANTA</b> <b>Boštjan Špetič (co-founder, CEO), Davorin Kopic (head of data science)</b> Zemanta provides a real-time bidding platform for global online advertising</p> <p><b>Better d.o.o. (izhaja iz firme MARAND), Emil Plesnik, Data Scientist</b> Better is at the forefront of healthcare digitalization. We are engaged in this complex challenge by developing solutions based on diverse technologies including AI. One of the developed AI solutions is Precision Dosing, which offers individualized simulation and optimization of medicine dosing strategies in less time, with improved</p>
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<p><b>15.00 – 15.30</b> slovenščina</p> 	<p><b>Reševanje težav elektromagnetne združljivosti (EMC)</b> <b>Dr. Jurij Tratnik</b> <b>Instrumentation Technologies d.o.o.</b></p> <p>Nadzor nad elektromagnetnimi motnjami z razmahom sodobnih tehnologij vedno bolj pridobiva na pomenu. Pri načrtovanju in razvoju elektronskih naprav je ključnega pomena tudi skladnost z EMC standardi. Če se v samem začetku temu področju ne nameni dovolj pozornosti, se lahko s težavami soočimo v času certifikacije. V podjetju Instrumentation Technologies d.o.o., strankam pomagamo pri srečevanju z EMC izzivi tako v razvojni fazi kot takrat, ko je izdelek tik pred vstopom na trg.</p>

	<p>accuracy and lower demand for patient's samples.</p> <p><b>Comtrade Digital services, Boris Cergol (Head of AI)</b> Comtrade is able to implement complex AI projects and Comtrade Digital Services developed an AI model for Stem (the largest Storage as a Service provider in the world) that forecasts the electricity demand for the next 39h. This allows Stem to significantly improve their battery charge and discharge cycles to optimize their usage, prolong their lifetime and maximize savings.</p> <p><b>Revelo, d.o.o., dr. Lan Žagar (CTO)</b> Revelo provides services in data engineering and machine learning, develops turnkey solutions, and provides hands-on training. We cooperate with a range of industries, including pharma, banks, telecom, and retailers.</p>
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<b>13.02.2020 Četrtek / Thursday</b>		<b>Predavalnica OJSTRICA</b>
<b>Čas/Time</b> Jezik/Language	<b>Naziv predavanja /Topic</b> <b>Predavatelj / Speaker</b>	
<b>9.30 – 11.00</b> slovenščina	<p><b>RFID in RTLS za avtomatsko zaznavanje objektov v interni logistiki</b></p> <p>Andrej Planina, Špica International d.o.o. Urban Brodnik, Špica International d.o.o.</p>	
<b>11.00 - 11.30</b> slovenščina	<p><b>Kolaborativna vakuumska penasta prijemala SCHMALZ</b></p> <p>Andraž Zupan, MB-NAKLO</p>	
	<p>SCHMALZ je vrhunski specialist za vakuumsko tehniko. FXCB predstavlja prijemalni sistem z nizko maso in vgrajenim pnevmatskim generatorjem podtlaka za manipulacijo obdelovancev na področju interne logistike. Je odlična rešitev za stacionarno manipulacijo s kolaborativnim robotom uporablja pa se tudi za paletizacijo in depaletizacijo kartonskih škatel. Ima inovativno zasnovo s povečano stično površino in zadošča standardom ISO TS 15066. Primerno je za manipulacijo obdelovancev do 35 kg, z različnimi površinami, geometrijami, porozne in neporozne obdelovance. Prijemalo je mogoče integrirati v okolja Industry 4.0. Na sejmu IFAM 2020 si je vakuumsko prijemalo mogoče ogledati na robotu.</p>	
<b>11.30 - 12.00</b> English	<p><b>Smart and Sensitive Gripping</b></p> <p>Daniel Kloimstein Project manager Automation Solutions, SCHUNK Austria</p>	
	<p>Intelligent Gripping Technology for each level of collaboration. Different types of Gripping Systems will be discussed on the basis of application examples from industrial environment.</p>	