Odjel elektrotehnike i elektronike

Zagreb, 2. prosinca 2024.

PLAN RADA ODJELA ELEKTROTEHNIKE I ELEKTRONIKE ZA 2025. GODINU

U 2025. godini članovi Odjela planiraju nastaviti rad na znanstvenim projektima:

- "Maximising Impact of Multidisciplinary Research in Early Diagnosis of Neonatal Brain Injury" (projekt: CA20124), European Cooperation in Science and Technology (COST); član MC i suradnik
- "Poboljšanje i rekonstrukcija slike temeljena na uvjetu prorijeđenosti s adaptivnim izračunom praga" (projekt: UNIRI-ISKUSNI-TEHNIC-23-90), Sveučilište u Rijeci; suradnik
- MATCHER - Istraživanje mogućnosti iskorištavanja topline iz obnovljivih izvora primjenom visokobrzinskog mikrogeneratora (MATCHER); NPOO – 2021. - 2026.
- DOLPMG - Koncept niskobrzinskog sinkronog stroja s permanentnim magnetima za direktan priključak na mrežu s visokim faktorom snage; NPOO – 2021. - 2026.
- GoToTwin – Interreg IPA ADRION – 2024. – 2027.
- 'CROatian Competence Centre for Semiconductors (CROCCS)' u okviru poziva DIGITAL-Chips-2024-SG-CCC-1
- Alat za preventivni redispeč elektroenergetskog sustava temeljen na optimalnim izmjeničnim tokovima snaga, NPOO 2021.-2026.,
- Početak rada na EURAMET projektu „A++SmartML: Automated, Adaptive and Uncertainty-aware Smart Measurements using Machine Learning"
- National Competence Centres in the framework of EuroHPC Phase 2 (EuroCC 2)

Planiraju se i sudjelovanja na sljedećim skupovima:

- 9. Konferencija o kibernetičkoj sigurnosti CSC 2025, Osijek, listopad 2025.
- the 7th edition of IEEE Workshop on Electrical Machine Design, Control and Diagnostics – WEMDCD – will be held in Valletta, Malta, on 9th-10th April 2025, - član odjela sudjeluje i u organizaciji
- ICREPQ'25 – Tenerife, June 2025.
- PES – Niš, August 2025., član odjela sudjeluje i u organizaciji
- IEEE PES ISGT EUROPE 2025, October 20th – 23rd, 2024.
- 17. Savjetovanju HRO CIGRE 2024, Cavtat, studeni 2024.

Planira se organizirati, pod pokroviteljstvom HATZ-a, 9. Konferencija o kibernetičkoj sigurnosti CSC 2025, Osijek kao i organizacija međunarodnog znanstvenog simpozija: "The 16th Symposium on Green Networking and Computing (SGNC2025)".

Kao i do sada, članovi Odjela nastavljaju rad kroz razne tehničke odbore kojih su članovi.

Tajnik Odjela elektrotehnike i elektronike

Prof. dr. sc. Mario Vražić

Odjel elektrotehnike i elektronike

Zagreb, 2. prosinca 2024.

IZVJEŠTAJ O RADU ODJELA ELEKTROTEHNIKE I ELEKTRONIKE ZA 2024. GODINU

U 2024. godini članovi Odjela su nastavili rad na znanstvenim projektima:

- "Maximising Impact of Multidisciplinary Research in Early Diagnosis of Neonatal Brain Injury" (projekt: CA20124), voditelj dr. sc. J. O'Toole, European Cooperation in Science and Technology (COST), 2021. – 2025.;
- Interreg projekt: "DIGITAL PLAN - Civil Protection Plan Digitalization through Internet of Things Decision Support System based Platform"
- MorphMetro - Secure and privacy-preserving analysis of measured data (morphmetro.eu)
- „Digital Transformation Call" (http://metpart.eu/dit-call-2022; „SRT-d03 Fundamental principles of sensor network metrology") i
- "Normative Call" (http://metpart.eu/nrm-call-2022; "SRT-n05 Support for standardisation of sample-by-sample waveform uncertainty computation")
- National Competence Centres in the framework of EuroHPC Phase 2 (EuroCC 2)
- MATCHER - Istraživanje mogućnosti iskorištavanja topline iz obnovljivih izvora primjenom visokobrzinskog mikrogeneratora (MATCHER); NPOO – 2021. - 2026.
- DOLPMG - Koncept niskobrzinskog sinkronog stroja s permanentnim magnetima za direktan priključak na mrežu s visokim faktorom snage; NPOO – 2021. - 2026.
- GoToTwin – Interreg IPA ADRION – 2024. – 2027.
- Projekt STRESS s tvrtkom ams-OSRAM (Austrija, Njemačka) vezan za analizu mehaničkog stresa u čipovima i utjecaju stresa na CMOS sklopove.
- Projekt CANFD s tvrtkom ams-OSRAM (Austrija, Njemačka) vezan za projektiranje IP blokova kao npr. CAN-FD, SPMI, te Arm, ARC i RISC-V procesira te potrebnih periferija i veznih sklopova.
- Sudjelovanje u pripremi projekta 'CROatian Competence Centre for Semiconductors (CROCCS)' u okviru poziva DIGITAL-Chips-2024-SG-CCC-1 u trajanju od 4 godine, koji je prihvaćen 11.11.2024. i od 2025. kreće njegovo financiranje. FER je koordinator (voditelj projekta na strani FER-a je doc. dr. sc. Tvrtko Mandić), a osim FER u projektu još sudjeluje 7 drugih partnera iz Hrvatske. Ukupno financiranje projekta za 4 godine iznosi 8 M EUR.
- Alat za preventivni redispeč elektroenergetskog sustava temeljen na optimalnim izmjeničnim tokovima snaga, NPOO 2021.-2026.
- Koordinacija i nadzor provede Strategije digitalizacije Grada Osijeka (financirano izravno od strane Grada Osijeka)
- TruPS - Enhancing Trusted Transatlantic Data Processing and Storage with Fully Homomorphic Encryption (trups.eu)
- Istraživanje naprednih algoritama i rješenja inovativne poslovne inteligencije u oblaku - NPOO.C3.2.R3-I1.04.0128

- National Competence Centres in the framework of EuroHPC Phase 2 (EuroCC 2)

Sudjelovalo se:

- Na predavanju i moderiranju panel rasprave na 10. bienalnom savjetovanju Hrvatskog mjeriteljskog društva, pod nazivom "Iskustva u laboratorijima i mjeriteljstvu"
- sa Penn State Universityjem u njihovom Edge programu (Experiential Digital Global Engagement)
- u događanju „W3bsi – Trust reimagined" i predstavljanje aktualnih projekata
- u koordinaciji i nadzoru provedbe Strategije digitalizacije Grada Osijeka (financirano izravno od strane Grada Osijeka)
- u radu odbora IEEE TC-10 "Waveform Generation, Measurement and Analysis Committee"
- u radu odbora IEC TC85 Working Group 22 "Measuring equipment for electrical and electromagnetic quantities"
- u radu odbora IMEKO TC-6 „Digitalization" kao član Upravnog odbora Hrvatskog mjeriteljskog društva
- kao član WG Digitalization Eurolab
- u prijavi novog projekta MZO Podrška transferu tehnologije: "Alat za preventivni redispeč elektroenergetskog sustava temeljen na optimalnim izmjeničnim tokovima snaga"
- Kao voditelj Radne skupina za izradu Samoanalize (Nastavnički kapaciteti i infrastruktura) u postupku reakreditacije Tehničkog fakulteta u Rijeci.
- 'Workshop on Sensors, Electronics and Emerging Applications (SEA) 2024', Cavtat, Croatia, 16 to 18 September 2024.
- '36th AKB Workshop, 2024, ams-OSRAM, Premstaetten, Austria, 21 to 22 November 2024.
- Predstavljanje aktualnih projekata na IMEKO World Congressu (Hamburg)
- Održavanje webinara za OIML na temu primjene specifičnih tipova enkripcije u mjeriteljstvu
- Održavanje webinara za IMEKO TC11 na temu moguće uloge blockchaina i enkripcije u digitalnoj transformaciji mjeriteljstva
- 7. središnja konferencija o održivoj gradnji 2024, Zagreb, 21.11.2024.
- Konferencija potpora za industriju sigurnosti i obrane 2024, Zagreb, 14.10.2024.
- Seminar European Space Agency (ESA) info day 2024, Zagreb, 28.11.2024.

Odobren je i znanstveni projekt između Fakulteta elektrotehnike, strojarstva i brodogradnje (FESB) Sveučilišta u Splitu i tvrtke Ericsson Nikola Tesla d.d., financiranog od strane tvrtke Ericsson Nikola Tesla d.d. na koje je član Odjela voditelja projekta naziva: „Data-driven artificial intelligence models for energy-efficient 5G radio resource allocation (5gENERGYOPT)".

Odobren je znanstveni projekt Interreg IPA ADRION poziva po imenu GoToTwin – član odjela je voditelj hrvatskog segmenta projekta.

Bili su i:

- gost rednik posebnog izdanja znanstvenog časopisa Sensors na temu „Special issue on Energy-Efficient Communication Networks and Systems: 2nd Edition“ (https://www.mdpi.com/journal/sensors/special_issues/T01878J9S0)

Objavljeni su i radovi:

- I. Volaric and V. Sucic, “A Fast Intersection of Confidence Intervals Method-Based Adaptive Thresholding for Sparse Image Reconstruction Using the Matrix Form of the Wavelet Transform”, Information, vol. 15, no. 2, article 71, 2024.
- L. Kolar and K. Mestrovic, “Gas (Bucholz) relais”, Polytechnic amnd Design, vol.11, no. 4, 2023.
- Lorincz Josip; Klarin Zvonimir, "A Comprehensive Analysis of the Impact of an Increase in User Devices on the Long-Term Energy Efficiency of 5G Networks", Smart Cities, Vol. (issue): 2024, 7(6), p.p.: 3616–3657, DOI: 10.3390/smartcities7060140, https://www.mdpi.com/2624-6511/7/6/140
- Lorincz, Josip; Kukuruzović, Amar; Blažević, Zoran; “A Comprehensive Overview of Network Slicing for Improving the Energy Efficiency of Fifth-Generation Networks”, Sensors, 2024 (2024), 24 (10); 1-34. doi: 10.3390/s24103242
- Šolić, Petar; Colella, Riccardo; Grassi, Giuseppe; Perković, Toni; Leo, Carlo Giacomo; Čulić, Ana; Pleština, Vladimir; Sabina, Saverio; Catarinucci, Luca; “Circuit Design, Realization, and Test of a Bluetooth Low Energy Wireless Sensor With On-Board Computation for Remote Healthcare Monitoring”, IEEE journal of radio frequency identification, 8 (2024), 105-113. doi: 10.1109/JRFID.2024.3363074
- Katulić, Filip; Groš, Stjepan; Sumina, Damir; Erceg, Igor; “Enhancing Industrial Automation and Control Systems Cybersecurity Using Endpoint Detection and Response Tools”, Lecture Notes in Networks and Systems. Cham: Springer International Publishing AG, 2024
- Kovačević, Ivana; Matić, Tomislav; Keser, Tomislav; Miling, Robert; “RS485 Network Design and Maintenance in Food Processing Industry: A Winery Application”, 32nd International Conference on Organization and Technology of Maintenance (OTO 2023), Conference proceedings. Cham: Springer, 2024. str. 134-142 doi: 10.1007/978-3-031-51494-4_12
- Zidar, Josip; Matić, Tomislav; Aleksi, Ivan; Hocenski, Željko; “Dynamic Voltage and Frequency Scaling as a Method for Reducing Energy Consumption in Ultra-Low-Power Embedded Systems”, Electronics (Basel), 13 (2024), 5; 826, 18. doi: 10.3390/electronics13050826
- Rogale, Dubravko; Firšt Rogale, Snježana; Knezić, Željko; Fajt, Siniša; Časar Veličan, Daniel; Jukl, Nikolina; “Process Parameters of High Frequency Welding”, Materials, 17 (2024), 2; 1-18. doi: 10.3390/ma17020517
- T. Špoljarić, A. Šešok, I. Pavić, B. Vuletić Komljen: " Salp Swarm Algorithm Application in Simultaneous Parameter Selection of Generators' Excitation Controllers for Power System Rotor Angle Stability Enhancement – WSCC Case Study", 47. međunarodni skup, Opatija 20. – 24.5.2024.

- I Sirotić, S Stipetić, M Kovačić, Determination of Current Transducer Phase Delay and its Effect on PWM-Induced Losses Calculation in Laminated Ferromagnetic Materials, 2024 International Conference on Electrical Machines (ICEM), 1-8, 2024
- B Ban, A Kersten, S Skoog, L Sjöberg, S Stipetić, T Batra, Comparative Analysis of Electric Motor Designs: Traditional Steel Laminations vs. Soft Magnetic Composite Materials, 2024 International Conference on Electrical Machines (ICEM), 1-8, 2024
- F Jukić, L Pravica, M Kovačić, S Stipetić, Voltage Sensorless Synchronization of a Grid-Side Converter Based on a Discontinuous Operating Mode and a Sliding Mode Observer, IEEE transactions on industry applications
- Andro Žamboki; Leo Gočan; Josip Mikulić; Gregor Schatzberger; Johannes Fellner; Tomislav Marković; Adrijan Barić, "Automated Optimal Resistance Measurement Method for Precision Resistor Stress Response Analysis," 2024 47th MIPRO ICT and Electronics Convention (MIPRO), Opatija, Croatia, 2024, pp. 1631-1636, doi: 10.1109/MIPRO60963.2024.10569194.
- Mislav Križan; Ivo Budanović; Marin Čoti; Jurica Kundrata; Vladimir Čeperić; Tvrtko Mandić; Tomislav Marković; Adrijan Barić, "Design and Verification Challenges in SoC Integration of PicoRV32 RISC-V with Sigma-Delta ADC," 2024 47th MIPRO ICT and Electronics Convention (MIPRO), Opatija, Croatia, 2024, pp. 1683-1687, doi: 10.1109/MIPRO60963.2024.10569876.
- Leo Gočan; Andro Žamboki; Josip Mikulić; Gregor Schatzberger; Johannes Fellner; Tomislav Marković; Adrijan Barić, "Analysis of Wheatstone Bridge Sensitivity for Applications in Integrated Piezoresistive Stress Sensors," 2024 47th MIPRO ICT and Electronics Convention (MIPRO), Opatija, Croatia, 2024, pp. 1637-1642, doi: 10.1109/MIPRO60963.2024.10569457.
- Andro Žamboki; Leo Gočan; Josip Mikulić; Gregor Schatzberger; Johannes Fellner; Tomislav Marković; Adrijan Barić, "Automated Optimal Resistance Measurement Method for Precision Resistor Stress Response Analysis," 2024 47th MIPRO ICT and Electronics Convention (MIPRO), Opatija, Croatia, 2024, pp. 1631-1636, doi: 10.1109/MIPRO60963.2024.10569194.
- Mislav Križan; Ivo Budanović; Marin Čoti; Jurica Kundrata; Vladimir Čeperić; Tvrtko Mandić; Tomislav Marković; Adrijan Barić, "Design and Verification Challenges in SoC Integration of PicoRV32 RISC-V with Sigma-Delta ADC," 2024 47th MIPRO ICT and Electronics Convention (MIPRO), Opatija, Croatia, 2024, pp. 1683-1687, doi: 10.1109/MIPRO60963.2024.10569876.
- Leo Gočan; Andro Žamboki; Josip Mikulić; Gregor Schatzberger; Johannes Fellner; Tomislav Marković; Adrijan Barić, "Analysis of Wheatstone Bridge Sensitivity for Applications in Integrated Piezoresistive Stress Sensors," 2024 47th MIPRO ICT and Electronics Convention (MIPRO), Opatija, Croatia, 2024, pp. 1637-1642, doi: 10.1109/MIPRO60963.2024.10569457.
- I. Hrgović, I. Pavić: Reward Design for Intelligent Deep Reinforcement Learning Based Power Flow Control using Topology Optimization, Sustainable Energy, Grids and Networks, https://doi.org/10.1016/j.segan.2024.101580

- A.Šešok, I.Pavić: SVC Control Strategy for Transient Stability Improvement of a Multimachine Power System, Energies 2024, Vol. 17, https://doi.org/10.3390/en17174224
- I. Hrgović, I. Pavić: Power Flow Control using multiple Phase-Shifting Transformers, IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT-Europe), October 14th – 17th 2024.
- N. Vukadinović, I. Pavić, N. Holjevac: Power transmission network planning under uncertainties, IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT-Europe), October 14th – 17th 2024.
- Jelena Šuljug, Josip Spišić, Krešimir Grgić and Drago Žagar, A Comparative Study of Machine Learning Models for Predicting Meteorological Data in Agricultural Applications, Electronics 2024, 13(16), 3284; https://doi.org/10.3390/electronics13163284 - 19 Aug 2024
- Igor Fosić, Drago Žagar; Classification of Network Traffic and Anomaly Detection Using Entropy in NetFlow Records. ELMAR, September 2024, DOI: 10.1109/ELMAR62909.2024.10694414

Članovi Odjela su sudjelovali i u organizacijama međunarodnih konferencija i recenziranju radova:

- The 5th International Conference on Broadband Communications for Next Generation Networks and Multimedia Applications (CoBCom), Graz, Austria, July 2024, Osijek
- Splitech 2024, Bol
- SST 2024
- The 5th International Conference on Broadband Communications for Next Generation Networks and Multimedia Applications (CoBCom 2024), Graz, Austrija;
- Sudjelovanje u recenziranju radova na The 31st International Conference on Systems, Signals and Image Processing (IWSSIP 2024), Graz, Austrija;
- ELECTRONICS'24, september 2024., Palanga, Litva;
- CARnet Users Conference
- CARNet The CUC
- CARNet Prva nacionalna NKS konferencija, rujan 2024.
- ELMAR 2024
- 8. Konferencija o kibernetičkoj sigurnosti CSC 2024, Osijek, 09. i 10. listopada 2024.
- "The 15th Symposium on Green Networking and Computing (SGNC2024)" održanog u okviru međunarodne konfernecije SoftCOM 2024.
- International Conference on Software, Telecommunications and Computer Networks (SoftCOM2024), Bol (Brač), 26-28.09.2024.
- Gost urednik posebnog izdanja na temu „Energy-Efficient Communication Networks and Systems: 2nd Edition" međunarodnog znanstvenog časopisa Sensors: https://www.mdpi.com/journal/sensors/special_issues/T01878J9S0

Članovi su sudjelovali i na skupu u HAZU: **Tehnologije potopljenih hidro agregata i njihov doprinos zaštiti okoliša**.

Članovi Odjela su, kao i do sada, radili kroz razne tehničke odbore i stručne udruge kojih su članovi.

Tajnik Odjela elektrotehnike i elektronike

Prof. dr. sc. Mario Vražić