

ETAI 2021 TECHNICAL PROGRAMME AGENDA

THURSDAY, 23. IX. 2021

SESSION - 1: CIRCUITS AND SYSTEMS

09:30 – 11:00

Co-Chairs: Katerina Raleva and Tomislav Kartalov

ETAI 1-1	A SONAR-BASED OBSTACLE DETECTION SYSTEM FOR THE BLIND AND VISUALLY DISABLED
	Stefana Hristovska, Kristijan Lazarev and Branislav Gerazov
ETAI 1-2	LIGHTING DESIGN, AUTOMATION, EFFICIENCY AND ADVANTAGES MADE WITH ILLUMINATION LEVEL CONTROL IN INDUSTRIAL FACILITIES
	Mehmet Gürcan Gür and Yilmaz Uyaroğlu
ETAI 1-3	DETECTION OF INDIVIDUAL FINGER FLEXIONS USING TWO-CHANNEL ELECTROMYOGRAPHY
	Blagoj Hristov and Gorjan Nadzinski
ETAI 1-4	THE SELECTION OF BI-FRACTIONAL ORDER REFERENCE MODEL PARAMETERS FOR MINIMUM SETTLE TIME
	Ertuğrul Keçeci, Erhan Yumuk, Müjde Güzelkaya and İbrahim Eksin
ETAI 1-5	INTRA-NODAL CACHING ASSISTED UAV BASED DATA ACQUISITION FROM WIRELESS MOBILE AD-HOC SENSOR NETWORKS
	Umair Chaudhry and Chris Phillips

SESSION - 2: CYBER SECURITY AND MATHEMATICS

09:30 – 11:00

Co-Chairs: Danijela Efnusheva and Sanja Atanasova

ETAI 2-1	ANALYSIS OF SMART HOME SECURITY BY APPLYING MACHINE LEARNING ALGORITHMS
	Irina Senchuk, Ana Cholakovska and Danijela Efnusheva
ETAI 2-2	NETWORK SECURITY ANALYSIS BY APPLYING MACHINE LEARNING ALGORITHMS
	Martina Shushlevska, Ana Cholakovska and Danijela Efnusheva
ETAI 2-3	NUMERICAL SOLUTION OF LAPLACE DIFFERENTIAL EQUATION USING THE FINITE DIFFERENCE METHOD
	Bojana Petrovska, Daniela Janeva, Emilija Tasheva and Andrijana Kuhar
ETAI 2-4	MODELING POPULATION DYNAMICS AND ECONOMIC GROWTH AS COMPETING SPECIES FOR NORTH MACEDONIA
	Stefan Boshkovski and Sanja Atanasova
ETAI 2-5	PERFORMANCE OF GRADIENT ALGORITHMS FOR SOLVING LEAST SQUARES PROBLEM
	Naum Dimitrieski, Katerina Hadzi-Velkova Saneva and Zoran Hadzi-Velkov

SESSION - 3: CONTROL SYSTEMS AND AUTOMATION

13:30 – 15:00

Co-Chairs: Mile Stankovski, Georgi Dimirovski

ETAI 3-1	MULTI-OBJECTIVE OPTIMIZATION BASED FRACTIONAL ORDER PID CONTROLLER DESIGN
	Erhan Yumuk, Eda Budak, Müjde Güzelkaya and İbrahim Eksin
ETAI 3-2	FRACTIONAL INTEGRATING INTEGER ORDER PI CONTROLLER DESIGN FOR THE FIRST INTEGER ORDER PLUS TIME DELAY SYSTEM
	Erhan Yumuk, Müjde Güzelkaya and İbrahim Eksin
ETAI 3-3	FUZZY LOGIC BASED MAXIMUM POWER POINT TRACKING FOR PHOTOVOLTAIC SYSTEMS
	Zeynep Bala Duranay and Hanifi Guldemir
ETAI 3-4	FUZZY-LOGIC OUTPUT-TRACKING CONTROL FOR UNCERTAIN TIME-DELAY DYNAMICAL PROCESSES: EXPLORING TAKAGI-SUGENO FUZZY MODELS
	Yuanwei Jing, Xin-Jiang Wei, Janusz Kacprzyk, Imre J Rudas and Georgi Dimirovski
ETAI 3-5	DISCRETE-TIME UNSCENTED KALMAN FILTERS WITH OPERATING OF UNCERTAINTIES: STOCHASTIC STABILITY ANALYSIS
	Yuanwei Jing, Jiahe Xu, Peng Shi and Georgi Dimirovski
ETAI 3-6	COMPLEX MULTI-NETWORKS WITH FAULTY INTER-NETWORK CONNECTIONS: SYNCHRONIZATION VIA NOVEL PINNING-NODE CONTROL
	Yuanwei Jing, Guanrong Chen, Peng Shi and Georgi Dimirovski

SESSION - 4: E-HEALTH

13:30 – 15:00

Co-Chairs: Hristijan Gjoreski, Daniel Denkovski

ETAI 4-1	INSIEME: A UNIFYING ELECTRONIC AND MOBILE HEALTH PLATFORM
	Primoz Kocuvan, Erik Dovgan, Tine Kolenik and Matjaž Gams
ETAI 4-2	A SYSTEM FOR AUTOMATIC DETECTION OF MAJOR DEPRESSIVE DISORDER BASEDON BRAIN ACTIVITY
	Daniela Janeva, Silvana Markovska-Simoska and Branislav Gerazov
ETAI 4-3	PREDICTING TRENDS AND ANOMALIES IN DAILY ACTIVITIES
	Vito Janko and Mitja Luštrek
ETAI 4-4	FINDING EFFICIENT INTERVENTION PLANS AGAINST COVID-19
	Nina Reščič, Vito Janko, David Susič, Carlo De Masi, Aljoša Vodopija, Matej Marinko, Tea Tušar, Erik Dovgan, Anton Gradišek, Matej Cigale, Matjaž Gams and Mitja Luštrek
ETAI 4-5	MACHINE LEARNING BASED ANOMALY DETECTION IN AMBIENT ASSISTED LIVING ENVIRONMENTS
	Ana Cholakovska, Valentin Rakovic, Hristijan Gjoreski, Bjarne Pfitzner, Bert Arnrich and Marija Kalendar
ETAI 4-6	INVESTIGATING PRESENCE OF ETHNORACIAL BIAS IN CLINICAL DATA USING MACHINE LEARNING
	Bojana Velichkovska, Hristijan Gjoreski, Daniel Denkovski, Marija Kalendar, Leo Anthony Celi and Venet Osmani

SESSION - 5: COMMUNICATION NETWORKS - 5G

**(SUPPORTED BY THE COMMUNICATIONS AND INFORMATION THEORY CHAPTERS OF IEEE
N. MACEDONIA SECTION)**

13:30 – 15:00

Co-Chairs: Tomislav Shuminoski, Pero Latkoski

ETAI 5-1	EVALUATION OF DISTRIBUTED NFV INFRASTRUCTURES FOR EFFICIENT EDGE COMPUTING IN 5G
	Gjorgji Ilievski and Pero Latkoski
ETAI 5-2	PARTICLE SWARM OPTIMIZATION (PSO) BASED RESOURCE ALLOCATION FOR DEVICE TO DEVICE COMMUNICATION FOR 5G NETWORK
	Wisam Hayder Mahdi and Necmi Taspinar
ETAI 5-3	INVESTIGATION OF EFFECT OF THE PILOT REUSE FACTOR VIA INTELLIGENT OPTIMIZATIONS ON ENERGY AND SPECTRAL EFFICIENCIES TRADE-OFF IN MASSIVE MIMO SYSTEMS
	Burak Kürşat Gül and Necmi Taşpınar
ETAI 5-4	COMPUTING ON THE EDGE: A SYSTEM AND TECHNOLOGY OVERVIEW
	Marija Poposka and Zoran Hadzi-Velkov
ETAI 5-5	MOBILE EDGE COMPUTING SERVICES WITH QOS SUPPORT FOR BEYOND 5G NETWORKS – USE CASES
	David Nunev, Tomislav Shuminoski, Bojana Velichkovska and Toni Janevski

FRIDAY, 24. IX. 2021

SESSION - 6: INSTRUMENTATION AND MEASUREMENTS

12:00 – 13:30

Co-Chairs: Mare Srbinovska, Kiril Demerdziev

ETAI 6-1	POSITIONAL VALUE MEASUREMENT FOR A ROOK AND KING VS ROOK CHESS ENDGAME ALGORITHM
	Adrijan Bozinovski and Filemon Jankuloski
ETAI 6-2	OVERVIEW OF SECURITY AND SAFETY SYSTEMS IN THE AUTOMOTIVE INDUSTRY
	Aleksandra Gjorgjievska, Mare Srbinovska and Martin Gjorgjievski
ETAI 6-3	DESIGN AND EVALUATION OF COLLABORATIVE LEARNING PLATFORM WITH INTEGRATED REMOTE LABORATORY ENVIRONMENT
	Zivko Kokolanski, Bodan Velkovski, Tomislav Shuminoski, Dušan Gleich, Andrej Sarjaš, Ana B. Kokolanska, Anita K. Mijovska, Matjaž Šegula, Matic Podobnik, Zlatko Ruščić and Tibor Kratofil
ETAI 6-4	ERROR EVALUATION IN REACTIVE POWER AND ENERGY MEASUREMENTS ADOPTING DIFFERENT POWER THEORIES
	Kiril Demerdziev and Vladimir Dimchev
ETAI 6-5	VIRTUAL REAL TIME POWER QUALITY DISTURBANCE CLASSIFIER BASED ON DISCRETE WAVELET TRANSFORM AND MACHINE LEARNING
	Petar Vidoevski, Dimitar Taskovski and Zivko Kokolanski
ETAI 6-6	IMPROVING THE EFFICIENCY OF GROUNDING SYSTEM ANALYSIS USING GPU PARALLELIZATION
	Bodan Velkovski, Blagoja Markovski, Vladimir Gjorgjievski, Marija Markovska, Leonid Grcev, Stefan Kalabakov and Elena Merdjanovska

SESSION - 7: CLOUD AND IOT TECHNOLOGIES

**(SUPPORTED BY THE COMMUNICATIONS AND INFORMATION THEORY CHAPTERS OF IEEE
N. MACEDONIA SECTION)**

12:00 – 13:30

Co-Chairs: Toni Janevski, Simon Bojadzievski

ETAI 7-1	TECHNOLOGICAL, REGULATORY AND BUSINESS ASPECTS OF LPWAN IMPLEMENTATION IN IOT
	Atanas Godzoski, Toni Janevski and Aleksandar Risteski
ETAI 7-2	EXTENDED PERFORMANCE EVALUATION OF THE TENDERMINT PROTOCOL
	Jovan Karamachoski and Liljana Gavrilovska
ETAI 7-3	ANALYSIS OF SECURITY MECHANISMS OF CONTAINERS IN CLOUD
	Martina Janakieska and Aleksandar Risteski
ETAI 7-4	THE APPLICATION OF THE INTERNET OF THINGS IN EVERYDAY EQUIPMENT AFFECTS TO HAVE A MORE EFFICIENT AND QUALITY LIFE
	Aleksandar Risteski and Avni Rustemi
ETAI 7-5	USER-TO-CLOUD LATENCY PERFORMANCE CHARACTERISTICS IN AN EUROPEAN CLOUD INFRASTRUCTURE
	Teodora Kochovska, Marija Kalendar and Simon Bojadzievski

SESSION - 8: ARTIFICIAL INTELLIGENCE IN AUTOMATION

12:00 – 13:30

Co-Chairs: Gorjan Nadzinski, Vesna Ojleska Latkoska

ETAI 8-1	FORECASTING DYNAMIC TOURISM DEMAND BY ARTIFICIAL NEURAL NETWORKS
	Cvetko Andreeski and Biljana Petrevska
ETAI 8-2	FORECASTING POWER CONSUMPTION FOR RESIDENTIAL SECTOR
	Aleksandra Zlatkova, Aneta Buckovska and Dimitar Taskovski
ETAI 8-3	MODULATION CLASSIFICATION WITH DEEP LEARNING: COMPARISON OF DEEP LEARNING MODELS
	Selçuk Balsüzen and Mesut Kartal
ETAI 8-4	MACHINE LEARNING APPROACH FOR AUTONOMOUS CONTROL OF VERTICAL CEMENT ROLLER MILLS
	Othon Manis, Gorjan Nadzinski and Mile Stankovski
ETAI 8-5	SELECTING AN OPTIMISATION ALGORITHM FOR OPTIMAL ENERGY MANAGEMENT IN GRID-CONNECTED HYBRID MICROGRID WITH STOCHASTIC LOAD
	Natasha Dimishkovska, Atanas Iliev and Borce Postolov
ETAI 8-6	COMPARATIVE ANALYSIS OF DIFFERENT HELIOSTAT FIELD CONTROL ALGORITHMS
	Ivan Andonov, Vesna Ojleska Latkoska and Mile Stankovski

SESSION - 9: COMMUNICATION TECHNOLOGIES

(SUPPORTED BY THE COMMUNICATIONS AND INFORMATION THEORY CHAPTERS OF IEEE N. MACEDONIA SECTION)

14:00 – 15:30

Co-Chairs: Zoran Hadzi-Velkov, Slavce Pejovski

ETAI 9-1	UNCERTAIN AQM/TCP COMPUTER AND COMMUNICATION NETWORKS: FIXED-TIME CONGESTION TRACKING CONTROL USING GAUSSIAN FUZZY-LOGIC EMULATOR
	Jindong Shen, Yuanwei Jing, Janusz Kacprzyk, Georgi M. Dimirovski
ETAI 9-2	WIRELESS POWERED ALOHA NETWORKS WITH FIXED USER RATES AND UAV-MOUNTED BASE STATIONS
	Slavche Pejovski and Zoran Hadzi-Velkov
ETAI 9-3	PERFORMANCE INVESTIGATION OF BIDIRECTIONAL OPTICAL IM/DD OFDM WDM-PON USING RSOA AS A COLORLESS TRANSMITTER
	Mahmoud Alhalabi, Necmi Taşpınar and Fady El-Nahal
ETAI 9-4	DEVELOPMENT AND DEPLOYMENT OF A LORAWAN PERFORMANCE TEST SETUP FOR IOT APPLICATIONS
	Simeon Trendov, Marija Kalendar and Eduard Siemens

SESSION ETAI – 10: ARTIFICIAL INTELLIGENCE IN BIOMEDICINE

(SUPPORTED BY THE COMPUTATIONAL INTELLIGENCE CHAPTER OF IEEE N. MACEDONIA SECTION)

14:00 – 15:30

Co-Chairs: Branislav Gerazov, Andrijana Kuhar

ETAI 10-1	THE REPRESENTATION OF SPOKEN VOWELS IN HIGH GAMMA RANGE OF CORTICAL ACTIVITY
	Daniela Janeva, Andrijana Kuhar, Lidija Ololoska-Gagoska and Branislav Gerazov
ETAI 10-2	SCORPIANO - A SYSTEM FOR AUTOMATIC MUSIC TRANSCRIPTION FOR MONOPHONIC PIANO MUSIC
	Bojan Sofronievski and Branislav Gerazov
ETAI 10-3	FACIAL EMOTION RECOGNITION USING DEEP LEARNING
	Gjorgji Smilevski and Tomislav Kartalov
ETAI 10-4	AUTOMATIC COMPOSITION OF TEXT AND MUSIC FOR A SONG IN MACEDONIAN USING DEEP LEARNING
	Angela Najdoska, Emilija Kotevska, Tamara Markachevikj and Hristijan Gjoreski
ETAI 10-5	MACHINE LEARNING AND DATA SCIENCE AWARENESS AND EXPERIENCE IN VOCATIONAL EDUCATION AND TRAINING FOR HIGH-SCHOOL STUDENTS
	Stefan Zlatinov, Branislav Gerazov, Gorjan Nadzinski and Tomislav Kartalov
ETAI 10-6	TOWARDS A SYSTEM FOR CONVERTING TEXT TO SIGN LANGUAGE IN MACEDONIAN
	Stefan Spasovski, Branislav Gerazov, Risto Chavdarov, Viktorija Smilevska, Aneta Crvenkovska, Tomislav Kartalov, Zoran Ivanovski and Toni Bachvarovski

PROGRAM

Day	Time	Virtual room 1	Virtual room 2	Virtual room 3
THURSDAY, 23. IX 2021	09:30-11:00	Session 1 (Circuits and systems) Zoom Link ID: 943 9993 9052 Pass:ETAI_1	Session 2 (Cyber security and Mathematics) Zoom Link ID: 962 3612 0428 Pass:ETAI_2	
	11:00-11:30	Conference Opening Zoom Link ID: 935 5274 2669 Pass:ETAI_OPEN		
	11:30-12:15	Plenary lecture 1 Prof. Peng Shi (Formation Control Design for Multi-agent Systems) Zoom Link ID: 935 5274 2669 Pass:ETAI_OPEN		
	12:15-13:00	Plenary lecture 2 Prof. Matjaz Gams (Is Web Transforming Our Minds and Where is Our Civilisation Going to?) Zoom Link ID: 935 5274 2669 Pass:ETAI_OPEN		
	13:00-13:30	Lunch Break		
	13:30-15:00	Session 3 (Control systems and automation) Zoom Link ID: 990 6823 4264 Pass:ETAI_3	Session 4 (eHealth) Zoom Link ID: 955 0609 0111 Pass:ETAI_4	Session 5 (Communication networks - 5G) Zoom Link ID: 921 5973 7239 Pass:ETAI_5
	15:00-16:30	Round Table 1: e-Heath and Pervasive Technologies: Challenges and Opportunities (moderator Dr. Hristijan Gjoreski) Zoom Link ID: 875 7839 0402		
FRIDAY, 24. IX 2021	10:00-10:45	Plenary lecture 3 Prof. Janusz Kacprzyk (Human-in-the-loop AI in decision and control systems: the role of linguistic data summaries) Zoom Link ID: 982 1242 8400 Pass:ETAI_PLEN		
	10:45-11:30	Plenary lecture 4 Dr. Tome Eftimov (Modern approaches for Benchmarking in Evolutionary Computation) Zoom Link ID: 982 1242 8400 Pass:ETAI_PLEN		
	11:30-12:00	Coffee Break		
	12:00-13:30	Session 6 (Instrumentation & Measurements) Zoom Link ID: 959 4581 0574 Pass:ETAI_6	Session 7 (Cloud and IoT technologies) Zoom Link ID: 985 2669 6825 Pass:ETAI_7	Session 8 (Artificial intelligence in Automation) Zoom Link ID: 941 5568 8584 Pass:ETAI_8
	13:30-14:00	Lunch Break		
	14:00-15:30	Session 9 Zoom Link (Communication technologies) ID: 979 4445 2721 Pass:ETAI_9	Session 10 (Artificial intelligence in Biomedicine) Zoom Link ID: 963 3489 3306 Pass:ETAI_10	
	15:30-17:00	Round Table 2: Next generation wireless communications - Opportunities and challenges for IoT (moderator Dr. Ljupco Jorguseski) Zoom Link ID: 910 8233 3630 Pass:ETAI_ROUND		
17:00-17:30	Closing ceremony ETAI 40th anniversary celebration Best paper awards Zoom Link ID: 934 1811 1014 Pass:ETAI_CLOSE			