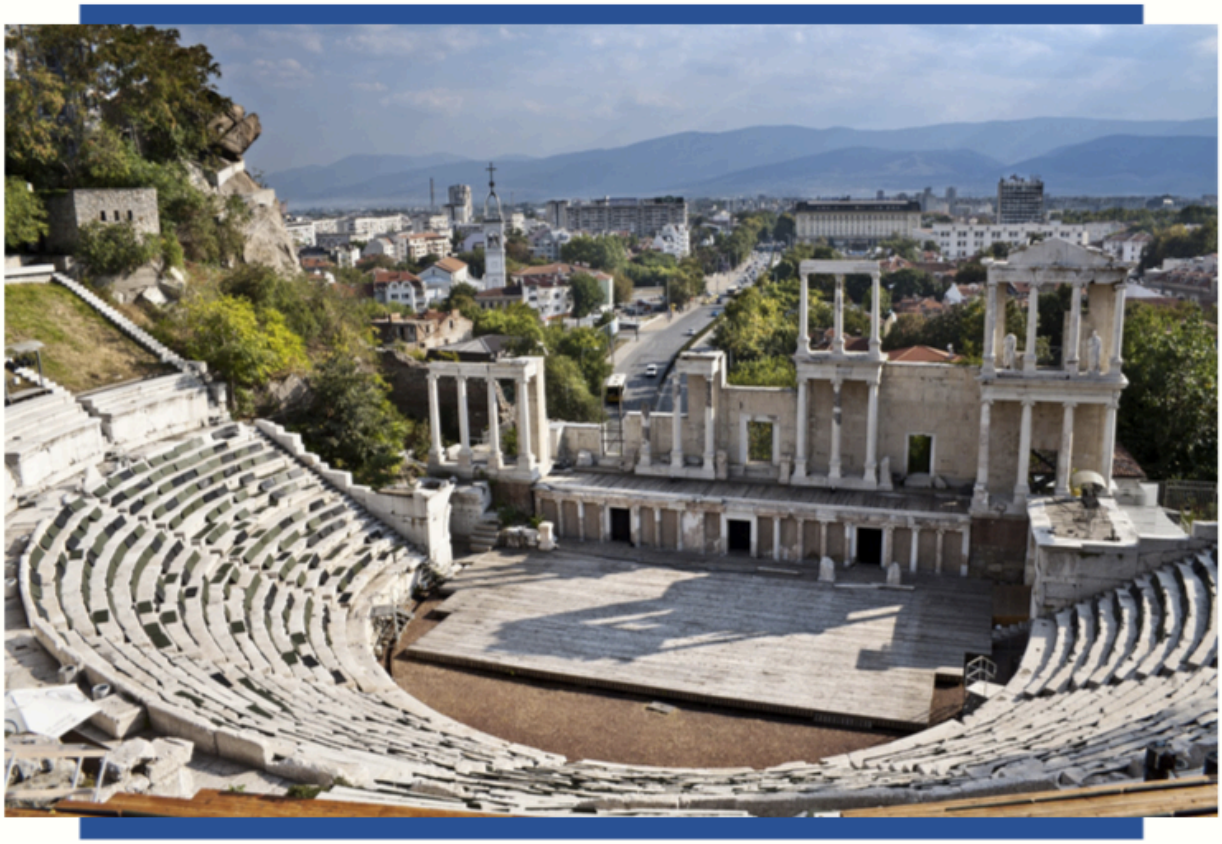
TECHNICAL UNIVERSITY – SOFIA
PLOVDIV BRANCH

13-TH INTERNATIONAL SCIENTIFIC CONFERENCE "ENGINEERING, TECHNOLOGIES AND SYSTEMS"

PROGRAM



TECHSYS 2024

16-18 May, Plovdiv, Bulgaria

TECHNICAL UNIVERSITY - SOFIA, PLOVDIV BRANCH

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TABLE OF CONTENTS

TIME SCHEDULE

<table>
<tr><td>16 MAY 2024</td><td>12:30-13:30 h</td><td colspan="3">Registration

The conference will be held at Technical University of Sofia,
Plovdiv Branch
25, Tsanko Dyustabanov Street
4000 Plovdiv, Bulgaria</td></tr>
<tr><td rowspan="5">16 MAY 2024</td><td>13:30-14:00 h</td><td colspan="3">TECHSYS 2024
Opening Ceremony - AULA</td></tr>
<tr><td>14:00-14:30 h</td><td colspan="3">Plenary Session - AULA</td></tr>
<tr><td>14:30-15:00 h</td><td colspan="3">Coffee Break</td></tr>
<tr><td rowspan="2">15:00-18:00 h</td><td>Sections
1 and 2
Hall 4326</td><td>Section 3
Hall 4328</td><td>Section 4
Hall 4422</td></tr>
<tr><td>Section 5
Hall 4327</td><td>Section 6
Hall 4425</td><td>Section 7
Hall 4323</td></tr>
<tr><td>19:00-22:00 h</td><td colspan="3">Conference Dinner at Imperial Hotel Plovdiv</td></tr>
<tr><td>17 MAY 2024</td><td>09:30-13:00 h</td><td>Section 4
Hall 4422</td><td>Section 6
Hall 4425</td><td>Section 7
Hall 4323</td></tr>
</table>

TECHSYS 2024 Sections

SECTION 1 - Automation, Control Systems and Robotics

SECTION 2 - Electrical Engineering and Electronics

SECTION 3 - Computer Engineering, Informatics and Communications

SECTION 4 - Mechanical Engineering

SECTION 5 - Automotive and Aeronautical Engineering

SECTION 6 - Materials Science

SECTION 7 - Industrial Management and Design

OPENING CEREMONY ACTIVITIES

16 MAY 2024
13:30 - 14:30 h

I. *Opening ceremony of "Science Days of Technical University - Sofia" 2024*

II. *Opening of 13th International Scientific Conference "TechSys 2024" – ENGINEERING, TECHNOLOGIES AND SYSTEMS*

III. *Plenary Session*

Engineering of the AI Trajectory-from Eliza to ChatGPT

Karamjit S Gill, *Professor Emeritus, University of Brighton (UK)*

Given that Open AI (ChatGPT, LLMS) offers the possibility to aggregate human cultural production, and AI provides huge potential of benefits to society, ranging from agriculture, medicine, health care, education and learning, workplace innovation, and poverty elimination.
Then why are we now facing a cultural crisis of embedding AI in societies? In other words, what is it about the engineering of predictive algorithms which drive social platforms that shapes our concerns about conspiracy theories, security, privacy, prejudice, and identity crisis. The talk explores this question and asks: how do we mould socially responsible AI tools for societal benefits whilst mitigating the danger of falling into the trap of Faustian seduction in which we bargain our soul with the machine in exchange for getting what we desire. During the 1980s the challenge and concern was how to mitigate the consequence of turning 'judgment' to 'calculation' and now the 2020s challenge and concern is about the impact and implication of turning the human (outer-inner) into data. Some of the key issues we face are: How do we design AI tools that align with societal goals such as those of trust and trustworthiness? Can the idea of the ethical machine drive towards taming ethical and moral dilemmas of alignment, beyond the Cartesian belief in human-AI co-evolution. Could a human-machine symbiotic framework as in Buber's conception of I-IT and I-Thou symbiosis and Shiva's Dance of harmony provide an alternative to the Faustian bargain? We then ask whether present day followers of the Cartesian faith allow themselves to heed Weizenbaum's warning that humans and computers belong to separate and incommensurable realms.

SECTION 1	AUTOMATION, CONTROL SYSTEMS AND ROBOTICS Hall 4326 Chair: Sevil Ahmed
16 MAY 2024 15:00 - 16:45 **in person and online**	**Robust Control of a Power System** *Andrey Yonchev, Kamen Perev*
	Measuring drone positioning accuracy using GPS and visual odometry method *Stanislav Gyoshev*
	Algorithm for detection of low-flying small objects from background radar *Nikolay Gueorguiev, Konstantin Nikolov, Albena Taneva*
	A Methods of Automated Count of Animals *Miglena Paneva, Peter Panev*
	From MRI to 3D-SNN Brain Models *Petia Koprinkova-Hristova, Simona Nedelcheva*

SECTION 2	ELECTRICAL ENGINEERING AND ELECTRONICS Hall 4326 Chair: Nikola Georgiev
16 MAY 2024 16:45 - 18:00 **in person and online**	**Modeling of the Reflecting Surface for Bistatic Radars of Low-Flying Small Object** *Daniela Pavlova, Nikolay Litchkov, Konstantin Nesterov, Atanas Nachev, Panayot Gindev, Yavor Boychev*
	Method for Evaluating Frequency Stability in Electrical Systems under Random Changes in their Load *Daniela Pavlova, Atanas Nachev, Panayot Gindev, Nikolay Litchkov, Konstantin Nesterov*
	Analysis of a Novel Electromagnetic Harvester *Vasil Spasov, Nikola Georgiev, Nikolai Paunkov*

SECTION 3	COMPUTER ENGINEERING, INFORMATICS AND COMMUNICATIONS Hall 4328 Chair: Dilyana Budakova
16 MAY 2024 15:00 - 18:00 **in person and online**	**Road Network Throughput Evaluation via Network Calculus** *Teodora Mecheva, Nikolay Kakanakov*
	Survey on Hardware Components Providing Information Security *Nikolay Kakanakov, Maria Marinova, Stefan Stoyanov*
	AI Opportunity in class with mobile robot XGO-mini 2 dog *Maya Staikova, Radoslav Vasilev, Nayden Chivarov*
	OPMAX Learning Agent Optimizing Performance Max Campaigns Using Random Forest Algorithm *Veselka Petrova-Dimitrova, Dilyana Budakova*
	Modeling Virtual Agent Behavior Using an Adaptive Multi-Plan Evacuation Strategy *Dilyana Budakova, Velyo Vasilev, Lyudmil Dakovski*
	DNA Segment Search Program *Emilia Pardo, Maria Marinova*
	Overview of the Modern Approach of Sequence Alignment Algorithms *Emilia Pardo*

SECTION 4	MECHANICAL ENGINEERING Hall 4422 Chair: Iliya Chetrokov and Raycho Raychev
16 MAY 2024 15:00 - 18:00 **in person and online**	**Failure mechanisms of stay vanes in a PHES Francis turbine unit** *Georgi Todorov, Ivan Kralov, Konstantin Kamberov, Yavor Sofronov, Blagovest Zlatev*
	Influence of fiber orientation on fluid flow in the filling process in T-RTM technology *Todor Todorov, Georgi Todorov, Blagovest Bankov*
	A multi-step approach for constructing a virtual analysis investigating fluid flow behavior in T-RTM technology and accounting for fiber orientation after molding of the reinforcing preform *Todor Todorov, Tzvetozar Ivanov, Blagovest Bankov*
	Reverse Engineering for Determining Residual Workpiece Geometry in Milling Process *Todor Gavrilov, Georgi Todorov, Ivan Ivanov, Mihail Zagorski*
	Delamination of a multilayered shaft at hard braking: an analytical model *Victor Rizov*
	Lengthwise fracture behavior of a functionally graded bar at sudden stopping *Victor Rizov*
	FEA Simulation Results to Determine the Required Insertion Force When Creating a Shaft-to-Hub Interference Fit *Dimitar Petrov*
	A Construction of a stands for a robotic palletizer *Miglena Paneva, Peter Panev, Nayden Chivarov*
	Approaches to virtual prototype validation of drop tests *Georgi Todorov, Konstantin Kamberov, Konstantin Dimitrov*
17 MAY 2024 10:00 - 12:00	**Prediction of the Creep Limit of 1.4852 M Steel at a Temperature of 900 °C** *Veselin Tzonev*

SECTION 4	MECHANICAL ENGINEERING Hall 4422 Chair: Iliya Chetrokov and Raycho Raychev
in person and online	**DEVELOPMENT OF a FEEDING SYSTEM FOR METAL SLEEVES WITH AXIAL FEATURES** *Penko Mitev*
	Optimization Dimensional Synthesis of an Excavator Front Digging Manipulator with R ‖ R ‖ R Kinematic Structure *Rosen Mitrev*
	Reverse Engineering and Optimization of Small-scale objects for Humanoid Robotic Systems *Mihail Zagorski, Radoslav Miltchev, Nikolay Nikolov, Tsvetozar Ivanov*
	Technology assessment for production of axial induction motor *Konstantin Kamberov, Georgi Todorov, Todor Gavrilov, Blagovest Zlatev*
	Physicochemical, thermodynamic and kinetic properties of sunflower oil for application of biodiesel fuel *Vanya Gandova and Ivalina Petrova*
	Effects of Micro Arc Oxidation on Metal Materials and Application Potential *Cem Misirli, Cenk Mısırlı*
	General Characterization of 5083 Aluminum Alloys and Examination of the Joining Method Using Friction Stir Welding *Cem Misirli, Cenk Mısırlı*

SECTION 5	AUTOMOTIVE AND AERONAUTICAL ENGINEERING Hall 4327 Chair: Atanas Nachev
16 MAY 2024 15:00 - 18:00 **in person and online**	**Simulation study of tiltwing-propeller VTOL aircraft in hover and cruise configurations.** *Hristian Panayotov, Martin Zikyamov*
	Algorithm for Expert Analysis of the Mechanism of the Occurrence of a Traffic Accident Involving a Car and a Pedestrian *Milena Mratsenkova, Danail Hlebarski*
	Investigation of LPG Influence on Cylinder Pressure of VW 1.9D Diesel Engine Operating in Dual-Fuel Mode *Atanasi Tashev, Evgeni Dimitrov*
	Traffic Flows Movement Optimization at a Traffic Light Junction in the Town of Razlog *Durhan Saliev, Georgi Mladenov, Vasil Asenov*
	Traffic Research on a Light Regulated Junction in the City of Sofia *Durhan Saliev, Iliyan Damyanov, Veronika Veselinova*
	Application Of The Momentum 360 Method for Side Collision Between Vehicles Through Computer Simulation *Yordan Stoyanov*
	Research analysis of coordinated traffic lights *Iliyan Andreev*
	Study of the Vibrations of Macpherson Suspension Components *Stiliyana Taneva, Krasimir Ambarev*

SECTION 6	MATERIALS SCIENCE Hall 4425 Chair: Boyan Dochev
16 MAY 2024 15:00 - 18:00 **in person and online**	**X-ray Diffraction Analysis of Thin Films Prepared by a Unique Deposition Cluster** *Jiří Čapek, Jakub Skočdopole, Karel Trojan, Nikolaj Ganev, Ladislav Kalvoda*
	Effect of Heat Treatment on Phase Composition and Mechanical Properties of AlSi18Cu5Mg Alloy *Boyan Dochev, Karel Trojan, Jiří Čapek, Nikolaj Ganev, Desislava Dimova*
	Structure and Mechanical Properties of an Alloy AlSi9Cu3 Modified with Sr and Subjected to Heat Treatment *Boyan Dochev*
	Investigation of the Effects of Artificial Ageing Parameters subsequent to Tempering of AlSi18Cu3CrMn Alloy on Corrosion Resistance *Kalina Kamarska, Desislava Dimova, Nadezhda Geshanova*
	Simulation Modeling of the Multistage Differential Bending Process of Photovoltaic Module Composite Materials *Valentin Kamburov*
	Boron Effect on Phase Composition and Mechanical Properties of High Chromium White Cast Irons *Julieta Kaleicheva, Rumyana Lasarova, Georgi Avdeev, Valentin Mishev, Zdravka Karaguiozova, Krassimir Kirov*
17 MAY 2024 10:00 - 11:30 **online**	**Production of lightweight material based on aluminum alloy foam** *Krassimir Marchev, Krum Petrov, Yavor Sofronov, Rayna Dimitrova, Antonio Nikolov, Georgi Lyutov, Milko Angelov, Konstantin Dimitrov*
	Prediction of Defects in Gravity Casting by Simulation Modeling *Krassimir Marchev, Krum Petrov, Yavor Sofronov, Rayna Dimitrova, Antonio Nikolov, Georgi Lyutov, Milko Angelov, Radoslav Milchev*

SECTION 6	MATERIALS SCIENCE Hall 4425 Chair: Boyan Dochev
	Electron Microscopy Study of Extruded Mixtures of Micro-scale Al Powder and Nano-scale TiN, SiC and Al2O3 Powders *Veselin Petkov, Yana Mourdjeva, Bojko Krastev, Vitaliy Bliznuk, Roumen Petrov, Valentin Manolov*
	Centrifugal casting of a two-layer billet for a mill shaft with application in the ceramic industry *Angel Velikov, Ivan Georgiev, Yavor Boychev, Boyko Krastev, Krum Petrov*
	Investigation on the structure of centrifugally cast bimetallic castings for a mill shaft *Angel Velikov, Ivan Georgiev, Yavor Boychev, Boyko Krastev, Krum Petrov*
	Investigation of the Possibilities of Deposition of Ceramic Coatings on 3D Printed Polymer Samples *Mihail Zagorski, Nikolay Stoimenov, Boyan Dochev*

SECTION 7	INDUSTRIAL MANAGEMENT AND DESIGN Hall 4323 Chair: Toni Mihova and Tanya Gigova
16 MAY 2024 15:00 - 18:00 **in person and online**	**Developing a Successful Brand Identity: Existing Systems and Approaches** *Kristin Ozanian*
	Implementation of the Graphic Standard of the Technical University - Sofia, Plovdiv Branch *Aleksandar Georgiev, Silvina Ilieva, Kristin Ozanian*
	Technological Transfer in Support of Industry: the Case of the University of Plovdiv Paisii Hilendarski *Daniela Pastarmadzhieva, Mina Angelova*
	Survey on Entrepreneurial Culture and Attitudes Across Students: A Pilot Study *Mina Angelova, Daniela Pastarmadzhieva*
	EU Competition Rules on Digital Markets *Mariyana Kovacheva*
	Fintech Lending – Beyond the Bricks and Mortal Banks Lending Model *Mariyana Kovacheva*
	Eco-Innovation Activity of Industrial Enterprises in Bulgaria *Tanya Gigova, Valentina Nikolova-Alexieva, Katina Valeva*
	State of the Digital Economy and the Place of Bulgaria *Tanya Gigova, Valentina Nikolova-Alexieva, Katina Valeva*
	Conditions and prospects for the modernization of cooperation between universities and business organizations *Aygyun Ertyurk-Mincheva, Megi Dakova, Margarita Ruseva*

SECTION 7	INDUSTRIAL MANAGEMENT AND DESIGN Hall 4323 Chair: Silvina Ilieva and Tanya Gigova
17 MAY 2024 10:00 - 13:00 **in person and online**	**Talent management models and systems** *Snezhinka Konstantinova, Nicolay Katrandzhiev*
	Corporate tax level and collection *Snezhinka Konstantinova, Nicolay Katrandzhiev, Asen Konarev*
	Adaptive data analytics in support of AgileHR *Stanimir Kabaivanov, Veneta Markovska*
	Changes in volatility of European financial markets - post-COVID effects *Stanimir Kabaivanov, Veneta Markovska*
	Technological Basis And Technological Cycle Of Competitive Engineering *Desislava Petrova*
	An Algorithm for Studying and Comparing Time Series Data on the Expenditures for Environmental Protection and Restoration *Delyana Dimova*
	Typographic scale for text readability and experimental verification of its effectiveness in education *Nadezhda Angelova*
	Integration of artificial intelligence into traditional graphic designer software products – a relief and a challenge *Nadezhda Angelova*
	The capabilities of the art-oriented artificial intelligence Adobe Firefly and its visual advantages and disadvantages *Nadezhda Angelova*