

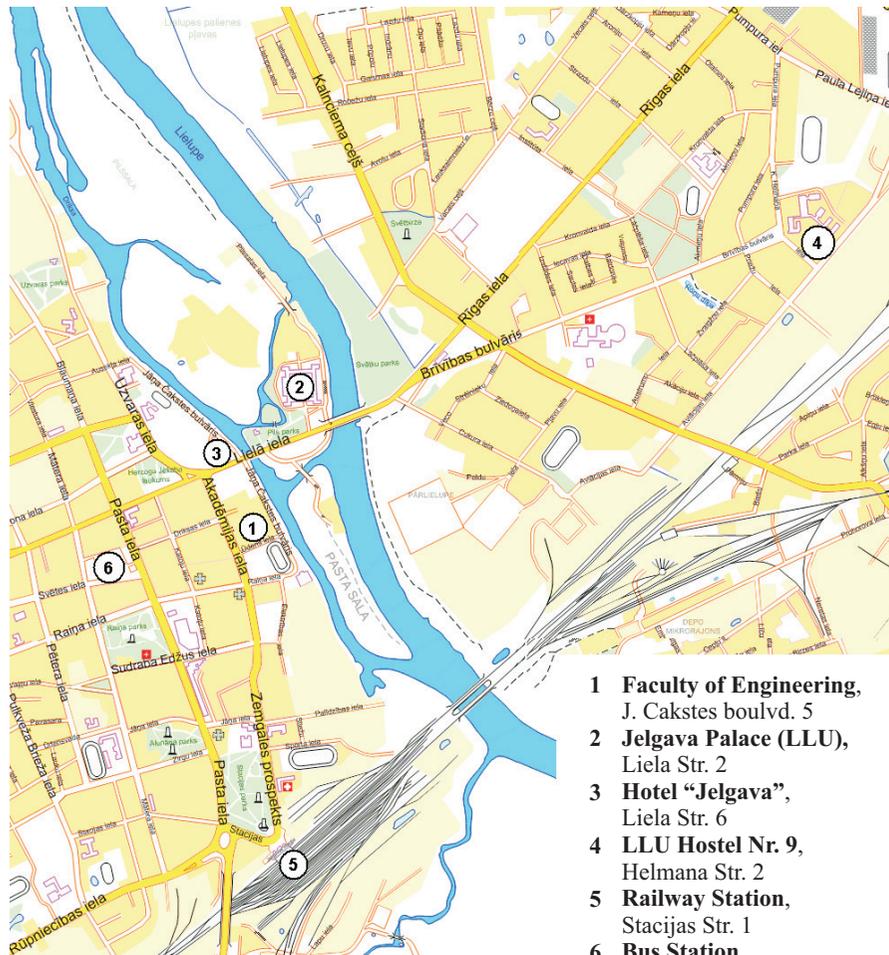
Latvia University of Life Sciences and Technologies  
Faculty of Engineering  
Latvian Academy of Agricultural and Forestry Sciences



21<sup>st</sup> International Scientific Conference

# ENGINEERING FOR RURAL DEVELOPMENT

## PROGRAMME



- 1 Faculty of Engineering,  
J. Cakstes boulvd. 5
- 2 Jelgava Palace (LLU),  
Liela Str. 2
- 3 Hotel "Jelgava",  
Liela Str. 6
- 4 LLU Hostel Nr. 9,  
Helmana Str. 2
- 5 Railway Station,  
Stacijas Str. 1
- 6 Bus Station,  
Pasta Str. 26



Jelgava, Latvia, May 25-27, 2022

**Latvia University of Life Sciences and Technologies  
Faculty of Engineering  
Latvian Academy of Agricultural and Forestry Sciences**

**21<sup>st</sup> International Scientific Conference  
ENGINEERING FOR RURAL  
DEVELOPMENT  
PROGRAMME**

**Jelgava, Latvia, May 25-27, 2022**

## Program Committee, Organising Committee

---

### PROGRAM COMMITTEE

- Chairman:** Aivars Aboltins, Latvia University of Life Sciences and Technologies, Latvia
- Members:** Valeriy Adamchuk, National Academy of Agrarian Science of Ukraine, Ukraine  
Mariusz Adamski, Bialystok University of Technology, Poland  
Zhauyt Algazy, Kazakh National Research Technical University, Kazakhstan  
Andres Annuk, Estonian University of Life Sciences, Estonia  
Atilgan Atilgan, Suleyman Demirel University, Turkey  
Marco Bietresato, Free University of Bozen-Bolzano, Italy  
Milan Brožek, Czech University of Life Sciences Prague, Czech Republic  
Volodymyr Bulgakov, National University of Life and Environmental Sciences of Ukraine, Ukraine  
Lóránt Dénes Dávid, Eszterházy Károly University, Hungary  
Givi Gavardashvili, Georgian Technical University, Georgia  
Marek Gaworski, Warsaw University of Life Science, Poland  
Semjons Ivanovs, Latvia University of Life Sciences and Technologies, Latvia  
Algirdas Jasinskas, Vytautas Magnus University, Lithuania  
Jan Radoslaw Kaminski, Warsaw University of Life Science, Poland  
Jozsef Kapozsta, Szent Istvan University, Hungary  
Pavel Kic, Czech University of Life Sciences Prague, Czech Republic  
Aigars Laizans, Latvia University of Life Sciences and Technologies, Latvia  
Francesco Marinello, University of Padova, Italy  
Agris Nikitenko, Riga Technical University, Latvia  
Juri Olt, Estonian University of Life Sciences, Estonia  
Andrea Pezzuolo, University of Padova, Italy  
Simon Popescu, Transylvania University of Brasov, Romania  
Juris Priekulis, Latvia University of Life Sciences and Technologies, Latvia  
Stasys Slavinskas, Vytautas Magnus University, Lithuania  
George Srzednicki, University of New South Wales, Australia  
Kaspars Vārtukaptēnis, Latvia University of Life Sciences and Technologies, Latvia  
Yang Zhang, The University of Sheffield, United Kingdom

### ORGANISING COMMITTEE

- Chairman:** Janis Palabinskis, Latvia University of Life Sciences and Technologies, Latvia
- Members:** Aivars Aboltins, Latvia University of Life Sciences and Technologies, Latvia  
Aivars Birkavs, Latvia University of Life Sciences and Technologies, Latvia  
Baiba Briede, Latvia University of Life Sciences and Technologies, Latvia  
Natalija Vronska, Latvia University of Life Sciences and Technologies, Latvia  
Ilmars Dukulis, Latvia University of Life Sciences and Technologies, Latvia  
Liene Kancevica, Latvia University of Life Sciences and Technologies, Latvia  
Ainars Galins, Latvia University of Life Sciences and Technologies, Latvia  
Vitalijs Osadcuks, Latvia University of Life Sciences and Technologies, Latvia  
Aldis Pecka, Latvia University of Life Sciences and Technologies, Latvia  
Mareks Smits, Latvia University of Life Sciences and Technologies, Latvia  
Dainis Viesturs, Latvia University of Life Sciences and Technologies, Latvia  
Olafs Vronskis, Latvia University of Life Sciences and Technologies, Latvia

## Timetable

---

### Wednesday, May 25

- 16<sup>00</sup> – 17<sup>00</sup> Registration of participants,  
Faculty of Engineering, LUA, 5 J. Cakstes blvd., 2<sup>nd</sup> floor, Room 211

### Thursday, May 26

- 9<sup>00</sup> – 10<sup>00</sup> Registration of participants,  
Faculty of Engineering, LUA, 5 J. Cakstes blvd., 2<sup>nd</sup> floor, Room 254
- 10<sup>00</sup> – 13<sup>00</sup> Work in sections  
presentation – **15 min**  
discussion – **5 min**
- 13<sup>00</sup> – 14<sup>00</sup> Photo, Lunch
- 14<sup>00</sup> – 16<sup>00</sup> Work in sections
- 16<sup>00</sup> – 16<sup>30</sup> Coffee break
- 16<sup>30</sup> – 18<sup>30</sup> Work in sections
- 19<sup>00</sup> Conference dinner  
Faculty of Engineering, LUA, 5 J. Cakstes blvd., 2<sup>nd</sup> floor, Room 254

### Friday, May 27

- 8<sup>15</sup> – 16<sup>30</sup> Social tour. Start from Faculty of Engineering, LLU, 5 J. Cakstes blvd.  
Places to visit: Medieval Castle Jaunpils, Durbe Castle, Abavas Winery

After social tour feel free to visit the events of Jelgava City Festival May 27-28.  
More info: <https://visit.jelgava.lv/en>

---



WiFi internet access during the conference (5 J. Cakstes blvd.)  
Network access using vouchers, ask at the registration table.

## Abstracted and indexed

---

Elsevier SCOPUS, Clarivate Analytics Web of Science, AGRIS, CAB Abstracts, CABI full text, EBSCO Academic Search Complete, EBSCO Central & Eastern European Academic Source, Agricola.

Scopus<sup>®</sup>

Clarivate  
Analytics  
WEB OF SCIENCE<sup>™</sup>

CABI

EBSCOhost

CrossRef Database: DOI for each paper

Crossref  
Content  
Registration

Cross-checked by: CrossRef.org Similarity Check.

Crossref  
Similarity Check  
Powered by iThenticate

**Online:** Proceedings ENGINEERING FOR RURAL DEVELOPMENT will be available online at <http://tf.llu.lv/conference/proceedings2022/>

## Partners and sponsors of the conference

---



Latvian Academy of Agricultural and Forestry  
Sciences, Unit of Engineering Sciences  
<http://llmza.lv/index.php/en/units/unit-of-engineering-sciences>

International Symposium on  
Hydrogen Energy, Renewable  
Energy and Materials  
<http://www.herem.org/>



**WEEDBOT**



Weedbot - High precision laser weeding  
technology  
<https://weedbot.eu/>

## Notes

---

## Section 1: Agricultural machinery

On-line section

Chairman:

Dr.sc.ing. **Semjons Ivanovs**,

*Latvia University of Life Sciences and Technologies, Latvia*

Vice-chairman:

Dr.sc.ing. **Adolfs Rucins**,

*Latvia University of Life Sciences and Technologies, Latvia*



<https://us06web.zoom.us/j/6423594492?pwd=cXB2N1Y0V2ZaaytHb05BOHARVnZkZ0z09>

- 10:00 STUDIES OF CUBICLE BED DESIGN IN LATVIAN DAIRY FARMS  
**Maris Mangalis, Juris Priekulis, Mara Mangale**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 10:20 PREDICTING CHANGES IN TRACTOR TRAVEL SPEED AT DIFFERENT INFLATION PRESSURES ON DRIVE TIRES  
**Algirdas Janulevicius, Vidas Damanauskas**  
*Vytautas Magnus University, Lithuania; Lithuanian Research Centre for Agriculture and Forestry, Lithuania*
- 10:40 ESTIMATION OF ELECTROSTATIC FIELD INFLUENCE ON QUALITY INDICATORS OF GRAIN MOTH EGGS FOR PRODUCTION *TRICHOGRAMMA*  
**Oleh Marus, Gennadii Golub, Yaroslav Yarosh, Natalja Karpiuk**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Polissia National University, Ukraine*
- 11:00 EVALUATION OF THE TRANSVERSE STRENGTH OF REED STALKS  
**Olafs Vronskis, Aivars Kakitis, Imants Nulle, Mareks Smits**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 11:20 RESEARCH OF VIBRATION LEVELS IN SPECIFIC PARTS OF VEHICLE TRAVELING AT VARYING SPEED ON ROAD WITH DIFFERENT TYPES OF SURFACE  
**Deniss Brodnevs, Maris Hauka, Muharbi Banovs, Guntis Strautmanis, Leonids Vinogradovs, Igors Scukins**  
*Riga Technical University, Latvia*
- 11:40 EXPERIMENTAL STUDIES OF FLEXIBLE SECTIONAL SCREW CONVEYOR TORQUE VALUE  
**Volodymyr Bulgakov, Oleksandra Trokhaniak, Valerii Adamchuk, Juri Olt, Semjons Ivanovs**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; National Scientific Centre Institute for Agricultural Engineering and Electrification of Ukraine, Ukraine; Estonian University of Life Sciences, Estonia; Latvia University of Life Sciences and Technologies, Latvia*

## Section 1: Agricultural machinery and husbandry

- 12:00 EXPERIMENTAL RESEARCH OF QUALITY INDICATORS OF OPERATION OF NEW POTATO HARVESTER  
**Volodymyr Bulgakov, Semjons Ivanovs, Simone Pascuzzi, Valerii Adamchuk, Zinovi Ruzhlyo, Yevhen Ihnatiev, Valentyna Kaminska**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Latvia University of Life Sciences and Technologies, Latvia; University of Bari Aldo Moro, Italy; National Scientific Centre Institute for Agricultural Engineering and Electrification of Ukraine, Ukraine; Dmytro Motornyi Tavria State Agrotechnological University, Ukraine; National Academy of Agrarian Sciences of Ukraine, Ukraine*
- 12:20 EXPERIMENTAL STUDIES OF IMPROVED POTATO DIGGER KRK-2 WITH V-SHAPED HEAP DISTRIBUTOR  
**Volodymyr Bulgakov, Semjons Ivanovs, Francesco Santoro, Valerii Adamchuk, Zinovi Ruzhlyo, Yevhen Ihnatiev, Valentyna Kaminska**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Latvia University of Life Sciences and Technologies, Latvia; University of Bari Aldo Moro, Italy; National Scientific Centre Institute for Agricultural Engineering and Electrification of Ukraine, Ukraine; Dmytro Motornyi Tavria State Agrotechnological University, Ukraine; National Academy of Agrarian Sciences of Ukraine, Ukraine*
- 12:40 INVESTIGATION OF ENERGY AND PERFORMANCE INDICATORS OF POTATO DIGGER WORK WITH EXPERIMENTAL DIGGING-SEPARATING OPERATING PART  
**Volodymyr Bulgakov, Semjons Ivanovs, Viktor Kornuchin, Zinovi Ruzhlyo, Yevhen Ihnatiev, Mykhailo Chernovol, Valentyna Kaminska**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Latvia University of Life Sciences and Technologies, Latvia; Dmytro Motornyi Tavria State Agrotechnological University, Ukraine; Central Ukrainian National Technical University, Ukraine; National Academy of Agrarian Sciences of Ukraine, Ukraine*
- 13:00 LUNCH
- 14:00 TESTING OF FUNICULAR TROLLEY FOR AGRICULTURAL OPERATIONS  
**Kaihua Liu, Fabio Pasquazi, Massimo Dore, Michele Graiff**  
*University of Padova, Italy; Nergal Consulting, Italy; Agrivolt SRL, Italy*
- 14:20 RESEARCH OF CONDITIONS OF RATIONAL CORRELATION OF DESIGN PARAMETERS OF TRACTOR AND PLOUGH AGGREGATE  
**Volodymyr Bulgakov, Semjons Ivanovs, Aivars Aboltins, Volodymyr Nadykto, Valerii Adamchuk, Viktor Kaminskiy, Ivan Holovach**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Latvia University of Life Sciences and Technologies, Latvia; Dmytro Motornyi Tavria State Agrotechnological University, Ukraine; National Scientific Centre Institute for Agricultural Engineering and Electrification of Ukraine, Ukraine; National Academy of Agrarian Sciences of Ukraine, Ukraine*
- 14:40 TECHNOLOGICAL EFFECTIVENESS OF TILLAGE UNIT WITH WORKING BODIES OF PARQUET TYPE IN TECHNOLOGIES OF CULTIVATION OF GRAIN CROPS  
**Ivan Rogovskii, Liudmyla Titova, Igor Sivak, Liudmyla Berezova, Andrii Vyhovskiy**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine*

## Section 1: Agricultural machinery

---

- 15:00 INVESTIGATION OF QUALITY INDICATORS OF OPERATION OF EXPERIMENTAL ROOT HEAD CLEANER FROM HOLM RESIDUES  
**Volodymyr Bulgakov, Ivan Holovach, Aivars Aboltins, Semjons Ivanovs**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Latvia University of Life Sciences and Technologies, Latvia*
- 15:20 THEORETICAL RESEARCH AND DEVELOPMENT OF INDICATOR OF PERMISSIBLE SOIL COMPACTION BY RUNNING SYSTEMS OF MACHINE-TRACTOR AGGREGATES  
**Volodymyr Bulgakov, Semjons Ivanovs, Aivars Aboltins, Ivan Holovach, Volodymyr Nadykto**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Latvia University of Life Sciences and Technologies, Latvia; Dmytro Motornyi Tavria State Agrotechnological University, Ukraine*
- 15:40 MATHEMATICAL MODEL FOR RELIABILITY ASSESSMENT OF DEVICE FOR PREPARATION AND DISTRIBUTION OF ANIMAL FEED AS “MAN-MACHINE”  
**Zinovy Ruzhlyo, Andriy Novitskii, Dmytro Milko, Volodymyr Bulgakov, Ivan Beloev, Adolfs Rucins**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Dmytro Motornyi Tavria State Agrotechnological University, Ukraine; Angel Kanchev University of Ruse, Bulgaria; Latvia University of Life Sciences and Technologies, Latvia*
- 16:00 COFFEE BREAK
- 16:30 TECHNOLOGICAL EFFECTIVENESS OF MACHINE FOR DIGGING SEEDLINGS IN NURSERY GROWN ON VEGETATIVE ROOTSTOCKS  
**Ivan Rogovskii, Liudmyla Titova, Ruslan Shatrov, Oleksandr Bannyi, Oleksandr Nadtochiy**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine*
- 16:50 INFLUENCE OF TRACTOR BALANCE AT FERTILIZER SPREADING ON WINTER WHEAT YIELD  
**Vidas Damanauskas, Algirdas Janulevicius**  
*Lithuanian Research Centre for Agriculture and Forestry, Lithuania; Vytautas Magnus University, Lithuania*

## Section 2: Material science , renewable energy and GHG emissions

---

Venue: 5 J.Cakstes blvd., Room 312

Chairman:

Dr.sc.ing. **Aivars Kakitis**,

*Latvia University of Life Sciences and Technologies, Latvia*

Vice-chairman:

Dr.sc.ing. **Egle Jotautiene**,

*Vytautas Magnus University, Lithuania*



<https://us06web.zoom.us/j/8171687053?pwd=ZGZZUm5XYk0xMjVMWHd5akxPOG1CUT09>

---

- 10:00 INFLUENCE OF MODIFICATION OF ALUMINUM ALLOYS ON THEIR THERMAL EXPANSION  
**Jan Novotny, Stefan Michna, Martin Jaskevic, Stanislaw Legutko, Iryna Hren**  
*J. E. Purkyne University in Usti nad Labem, Czech Republic; Poznan University of Technology, Poland*
- 10:20 OPTIMIZATION OF PRODUCTION PROCESS OF STRUCTURAL STEEL MODIFIED WITH NITROGEN AND VANADIUM  
**Yevhenii Aftandiliants, Svyatoslav Gnyloskurenko, Helena Meniailo, Valerii Khrychikov**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Ukrainian State University of Science and Technologies, Ukraine*
- 10:40 INFLUENCE OF ANIMAL SLURRY ON CARBON C35 STEEL WITH DIFFERENT MICROSTRUCTURE AT ROOM TEMPERATURE  
**Tomasz Lipinski, Jacek Pietraszek**  
*University of Warmia and Mazury in Olsztyn, Poland; Cracow University of Technology, Poland*
- 11:00 INFLUENCE OF OXYGEN CONTENT IN MEDIUM CARBON STEEL ON BENDING FATIGUE STRENGTH  
**Tomasz Lipinski, Jacek Pietraszek, Anna Wach**  
*University of Warmia and Mazury in Olsztyn, Poland; Cracow University of Technology, Poland*
- 11:20 VARIATION OF VITAMINS AND MINERALS IN FOUR TYPES OF PACKAGING DURING SHELF LIFE OF PASTEURISED EGGS  
**Vjaceslavs Kocetkovs, Sandra Muizniece-Brasava**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 11:40 SOME ASPECTS OF EXTRACTION AND APPLICATION OF SEAWEED *FURCELLARIA LUMBRICALIS* CARRAGEENAN IN PRODUCTION OF RECYCLED PAPER  
**Sintija Ozolina, Uldis Zaimis**  
*Liepaja University, Latvia*
- 12:00 ASSESSMENT OF ECONOMIC INDICATORS, ENERGY INPUTS AND GREENHOUSE GAS EMISSIONS APPLYING DIFFERENT WEED CONTROL TECHNOLOGIES FOR FIELD BEAN (*VICIA FABIA*) GROWING (A CASE STUDY)  
**Adolfs Rucins, Dainis Viesturs, Jevgenija Necajeva, Guna Bundzena, Viktorija Zagorska**  
*Latvia University of Life Sciences and Technologies, Latvia*

## Section 2: Material science , renewable energy and GHG emissions

---

- 12:20 INVESTIGATION INTO REGENERATION REGIMES FOR CONVERTED ELECTRIC VEHICLE IN ROAD TESTS  
**Dainis Berjoza, Inara Jurgena**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 12:40 RECYCLED ALGAE PAPER DENSITY CONTROL SYSTEM FOR QUALITY SCREENING WITH ADJUSTABLE LIGHT SOURCE WAVELENGTH  
**Uldis Zaimis, Sintija Ozolina, Andrejs Kukuskins**  
*Liepaja University, Latvia*
- 13:00 LUNCH
- 14:00 ASSESSMENT OF ENERGY PROPERTIES OF MAIZE AND MULTI-CROP PELLETS AND ENVIRONMENTAL IMPACT OF THEIR COMBUSTION  
**Algirdas Jasinskas, Rita Petlickaite, Egle Jotautiene, Egidijus Lemanas, Jiri Soucek**  
*Vytautas Magnus University, Lithuania; Lithuanian Energy Institute, Lithuania; Research Institute of Agricultural Engineering, p.r.i., Czech Republic*
- 14:20 EXPERIMENTAL AND NUMERICAL RESEARCH OF GRANULAR MANURE FERTILIZER APPLICATION BY CENTRIFUGAL FERTILIZER SPREADING  
**Egle Jotautiene, Vaidas Bivainis, Ramunas Mieldazys, Aloyzas Gaudutis, Algirdas Jasinskas**  
*Vytautas Magnus University, Lithuania*
- 14:40 USE OF HEATING PUMP TO REDUCE CARBON FOOTPRINT OF GREENHOUSE HEATING  
**Agris Auce, Adolfs Rucins, Aivars Jermuss, Indulis Arnis Horns, Ugis Grinbergs**  
*University of Latvia, Latvia; Latvia University of Life Sciences and Technologies, Latvia; Institute of Mathematics and Computer Science, University of Latvia, Latvia*
- 15:00 PRODUCTIVITY AND GHG BALANCE OF HARVESTING AND FORWARDING IN THINNING OF ASPEN HYBRID PLANTATIONS  
**Agris Zimelis, Gints Spalva**  
*Latvian State Forest Research Institute Silava, Latvia*
- 15:20 CARBON DIOXIDE (CO<sub>2</sub>) EMISSIONS FROM NATURALLY WET AND DRAINED NUTRIENT-RICH ORGANIC FORESTS SOILS  
**Aldis Butlers, Gints Spalva, Ieva Licite, Dana Purvina**  
*Latvian State Forest Research Institute Silava, Latvia*
- 15:40 NITROUS OXIDE (N<sub>2</sub>O) AND METHANE (CH<sub>4</sub>) FLUXES FROM TREE STEMS IN BIRCH AND BLACK ALDER STANDS - A CASE STUDY IN FORESTS WITH DEEP PEAT SOILS  
**Andis Lazdins, Aldis Butlers, Ritvars Ancans**  
*Latvian State Forest Research Institute Silava, Latvia*
- 16:00 COFEE BREAK

## Section 2: Material science , renewable energy and GHG emissions

---

- 16:30 SHORT TERM IMPACT OF APPLICATION OF DIFFERENT DOSES OF WOOD ASH ON GREENHOUSE GAS (GHG) EMISSIONS FROM PEAT  
**Jordane Champion, Andis Lazdins, Gints Spalva**  
*Latvian State Forest Research Institute Silava, Latvia*
- 16:50 ANAEROBIC FERMENTATION OF KITCHEN WASTE  
**Vilis Dubrovskis, Imants Plume**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 17:10 IMPROVEMENT OF ANAEROBIC FERMENTATION OF MECHANICALLY PRETREATED LIGNOCELLULOSIC BIOMASS  
**Imants Plume, Vilis Dubrovskis, Matiss Klavins**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 17:30 STUDIES OF GRANULES OF VARIOUS DIGESTATE AND WOOD ASH MIXTURES  
**Vilis Dubrovskis, Aleksandrs Adamovics, Imants Plume, Aivars Kakitis**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 17:50 POSSIBILITIES FOR IMPROVEMENT OF PLANT NUTRIENT MANAGEMENT IN BIOGAS PLANTS IN LATVIA  
**Imants Plume**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 18:10 METHOD FOR CALCULATION OF STRENGTH OF SIDE FRAMES OF FREIGHT WAGON BOGIES  
**Ramis Zaripov, Pavels Gavrilovs, Zhanar Karimova, Nurbolat Sembaev, Dinara Imangazinova**  
*Toraighyrov University, Kazakhstan; Riga Technical University, Latvia*

### Section 3: Modelling and simulation

---

Venue: 5 J.Cakstes blvd., Room 215

Chairman:

Dr.sc.ing. **Aivars Aboltins**,

*Latvia University of Life Sciences and Technologies, Latvia*

Vice-chairman:

Dr.sc.ing. **Atilgan Atilgan**,

*Alanya Alaaddin Keykubat University, Turkey*



<https://us06web.zoom.us/j/7270687094?pwd=UDRONVZaNGQ2RENCQnlkWWZjRXVhZz09>

---

- 10:00 MECHANICAL BEHAVIOUR NUMERICAL INVESTIGATION OF COMPOSITE STRUCTURE, CONSISTING OF POLYMERIC NANOCOMPOSITE MAT AND TEXTILE  
**Jaymin-Vrajlal Sanchaniya, Sai-Pavan Kanukuntla, Premjil Modappathi, Arturs Macanovskis**  
*Riga Technical University, Latvia*
- 10:20 MODELLING AND ANALYSIS OF COMPOSITE POLYACRYLONITRILE NANOFIBER MATS UTILIZED TO STRENGTHEN MOTORBIKE SIDE PANEL  
**Jaymin-Vrajlal Sanchaniya, Sai-Pavan Kanukuntla, Apsal Shereef, Janis Kaneps**  
*Riga Technical University, Latvia*
- 10:40 ANALYSIS OF MECHANICAL PROPERTIES OF COMPOSITE NANOFIBERS CONSTRUCTED ON ROTATING DRUM AND COLLECTOR PLATE  
**Jaymin-Vrajlal Sanchaniya, Sai-Pavan Kanukuntla, Shino Simon, Anita Gerina-Ancane**  
*Riga Technical University, Latvia*
- 11:00 ANALYSIS OF HONEYCOMB STRUCTURE EVALUATED IN STATIC AND IMPACT LOADING  
**Jaymin-Vrajlal Sanchaniya, Sai-Pavan Kanukuntla, Avirup Dutta, Vladislav Jevstignejevs**  
*Riga Technical University, Latvia; Czech University of Life Sciences Prague, Czech Republic*
- 11:20 FINITE ELEMENT MODEL OF CLOSED COMPOSITE CYLINDER AND ITS EXPERIMENTAL VERIFICATION  
**Aleksejs Safonovs, Andrejs Kovalovs, Aleksej Mironovs, Andris Chate**  
*D un D Centrs, Latvia; Riga Technical University, Latvia*
- 11:40 SENSITIVITY OF NON-DESTRUCTIVE TECHNIQUE FOR DETERMINATION OF MATERIAL PROPERTIES IN REINFORCED LAMINATED COMPOSITE PLATE BASED ON VIBRATION RESPONSE  
**Andrejs Kovalovs, Sandris Rucevskis, Karlis Dzelzitis, Andris Chate**  
*Riga Technical University, Latvia*
- 12:00 APPROACHES TO DESIGNING A MOBILE VACUUM SYSTEM “METAMORPHOSIS” FOR SPACE SIMULATION  
**Natalija Mozga, Juris Gutans, Raivis Kubulins**  
*Riga Technical University, Latvia*

### Section 3: Modelling and simulation

---

- 12:20 STRUCTURAL VIBRATION ANALYSIS OF INTERMODALLY TRANSPORTABLE SPACE SIMULATION CHAMBER  
**Nikolajs Glizde, Ilmars Blumbergs, Pauls Irbins**  
*Riga Technical University, Latvia*
- 12:40 MATHEMATICAL MODELLING OF NONLINEAR DYNAMIC SYSTEMS  
**Inna Samuilik, Felix Sadyrbaev, Svetlana Atslega**  
*Daugavpils University, Latvia; Institute of Mathematics and Computer Science, University of Latvia, Latvia; Latvia University of Life Sciences and Technologies, Latvia*
- 13:00 LUNCH
- 14:00 COMPARATIVE ANALYSIS OF DIFFERENT SHAPE VENTILATION ELEMENTS FOR PROTECTIVE CLOTHING  
**Alexander Janushevskis, Sanjay-Rajni Vejanand, Agris Gulevskis**  
*Riga Technical University, Latvia; Ekasol, Latvia*
- 14:20 OPTIMIZATION OF PRISM SURFACE SHAPE IN INTERACTION WITH FLUID FLOW  
**Kristaps Spade, Janis Viba, Martins Irbe, Shraavan Koundinya Vutukuru**  
*Riga Technical University, Latvia*
- 14:40 MODELLING OF HEAT TRANSFER PROBLEM IN LAYERED GYPSUM WALL WITH DIFFERENT GYPSUM DENSITIES IN CASE OF FIRE  
**Aivars Aboltins, Ilmars Kangro, Harijs Kalis**  
*Latvia University of Life Sciences and Technologies, Latvia; Rezekne Academy of Technologies, Latvia; Institute of Mathematics and Computer Science, University of Latvia, Latvia*
- 15:00 NON-STANDARD METHOD OF SOLVING DIRECT AND INVERSE PROBLEMS FOR HYPERBOLIC EQUATIONS  
**Tabita Treilande, Ilmars Iltins**  
*Riga Technical University, Latvia*
- 15:20 STATIC ANALYSIS OF TIPPING SUPERSTRUCTURE OF SINGLE-AXLE TRACTOR TRIALER  
**Jan Dizo, Miroslav Blatnický, Rafal Melnik, Stanislav Semenov, Evgeny Mikhailov, Jakub Kurtulik**  
*University of Zilina, Slovakia; Lomza State University of Applied Sciences, Poland; Volodymyr Dahl East Ukrainian National University, Ukraine*
- 15:40 UNORDINARY SITUATION ASSESSMENT OF HUMAN FATIGUE AND DROWSINESS IN EXPERT DECISION-MAKING SYSTEMS  
**Matiss Erins, Zigurds Markovics**  
*Riga Technical University, Latvia*
- 16:00 COFFEE BREAK

### Section 3: Modelling and simulation

---

- 16:30 STATISTICAL ANALYSES AND HYDROMETEOROLOGICAL PARAMETERS OF LONG-YEAR WATER LEVELS AND VOLUMES: EXAMPLE OF LAKE EGIRDIR  
**Atilgan Atilgan, Ali Yucel, Monika Markovic**  
*Alanya Alaaddin Keykubat University, Turkey; Osmaniye Korkut Ata University, Turkey; Josip Juraj Strossmayer University of Osijek, Croatia*
- 16:50 DATA FUSION OF VIDEO AND LIDAR TRAFFIC SURVEILLANCE DATA: PRACTICAL ASSESSMENT OF IMPLEMENTED SOLUTION IN JELGAVA CITY  
**Nikolajs Bumanis, Gatis Vitols, Inga Meirane**  
*Latvia University of Life Sciences and Technologies, Latvia; WeAreDots Ltd, Latvia*
- 17:10 EVALUATION OF COMBINE HARVESTER PERFORMANCE TELEMETRY DATA  
**Antanas Juostas, Egle Jotautiene, Grazvydas Juodisius**  
*Vytautas Magnus University, Lithuania; Marijampole Vocational Education Training Center, Lithuania*
- 17:30 DEVELOPMENT OF THE DIBICOO BIOGAS AND GASIFICATION MATCHMAKING PLATFORM  
**Vitalijs Komasilovs, Aleksejs Zacepins**  
*Latvia University of Life Sciences and Technologies, Latvia*

### Section 4: Engineering economics and engineering education

---

Venue: 5 J.Cakstes blvd., Room 336

Chairman:

Dr.sc.ing. **Natalija Vronska,**

*Latvia University of Life Sciences and Technologies, Latvia*

Vice-chairman:

Dr.sc.ing. **Baiba Briede,**

*Latvia University of Life Sciences and Technologies, Latvia*



<https://us06web.zoom.us/j/9063981927?pwd=RGZwNVQ3bWptWkpoUi9jZFIFdVR2Zz09>

---

- 10:00 GAINS FROM INTRODUCING E-CMR BY INTERNATIONAL MANUFACTURING COMPANY  
**Lasma Licite-Kurbe, Zane Ozolina**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 10:20 OPTIMAL SOLUTIONS FOR SPECIAL MACHINERY AND EQUIPMENT NORMS REQUIRED BY THE LATVIAN STATE FIRE AND RESCUE SERVICE  
**Viktorija Politika, Maris Ziemelis, Jelena Pundure**  
*State Fire and Rescue Service, Latvia; Riga Technical University, Latvia*
- 10:40 INNOVATIONS FOR SATISFIED PASSENGERS AT RIGA INTERNATIONAL AIRPORT  
**Inese Abolina**  
*University of Latvia, Latvia*
- 11:00 SUSTAINABLE DEVELOPMENT STRATEGY OPTIONS IN URBAN ENVIRONMENT  
**Rainers Blums, Janis Zvirgzdins, Ineta Geipele**  
*Riga Technical University, Latvia*
- 11:20 DEVELOPMENT STRATEGY OF SUSTAINABLE URBAN ENVIRONMENT IN JELGAVA  
**Rainers Blums, Janis Zvirgzdins, Ineta Geipele**  
*Riga Technical University, Latvia*
- 11:40 SECTOR ANALYSIS OF DAIRY SECTOR IN THE BALSTIC STATES USING AGMEMOD MODEL BASELINE VALIDATION  
**Aleksandra Rizojeva-Silava, Sandija Zeverte-Rivza**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 12:00 CLIMATE RISKS AND THEIR IMPACT ON DEVELOPMENT OF RES IN RURAL REGIONS OF KAZAKHSTAN  
**Vladislav Zavadskiy, Gita Revalde**  
*Almaty University of Power Engineering and Telecommunication, Kazakhstan; Riga Technical University, Latvia*
- 12:20 USE OF CTL HARVESTER .HPR AND .MOM FILES TO ANALYZE IMPACT OF OPERATOR TRAINING ON PRODUCTIVITY  
**Aigars Strubergs, Andis Lazdins, Linards Sisenis**  
*Latvia University of Life Sciences and Technologies, Latvia; Latvian State Forest Research Institute Silava, Latvia*

#### Section 4: Engineering economics and engineering education

---

- 12:40 COMPARATIVE DYNAMIC ANALYSIS OF VALUE ADDED CREATED BY INDUSTRY “MANUFACTURE OF WOOD AND OF PRODUCTS OF WOOD AND CORK, EXCEPT FURNITURE; MANUFACTURE OF ARTICLES OF STRAW AND PLAINTING MATERIALS” IN BALTIC STATES AND FINLAND  
**Andrejs Jaunzems, Ilze Balode**  
*Ventspils University of Applied Sciences, Latvia*
- 13:00 LUNCH
- 14:00 TERTIARY STEM FIELDS EDUCATION IN THE CONTEXT OF THE BALTIC STATES  
**Gunita Mazure**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 14:20 TEACHING DESIGN AND CONSTRUCTION SUBJECTS FOR SUSTAINABLE EDUCATION AND DEVELOPMENT OF CONSTRUCTION INDUSTRY  
**Linda Kauskale, Adil Afsar, Janis Zvirgzdins**  
*Riga Technical University, Latvia*
- 14:40 POSTGRADUATE ENGINEERING STUDENTS' REFLECTIONS ON BLENDED LEARNING IN ACADEMIC ENGLISH COURSE  
**Tatjana Sinkus, Inese Ozola**  
*Latvia University of Life Sciences and Technologies, Latvia*
- 15:00 DISTANCE TEACHING EXPERIENCES OF ENGINEERING LECTURERS AT LATVIAN AND LITHUANIAN UNIVERSITIES DURING COVID-19 LOCKDOWN  
**Natalija Sergejeva, Judita Kasperuniene**  
*Latvia University of Life Sciences and Technologies, Latvia; Vytautas Magnus University, Lithuania*
- 15:20 USE OF ICT IN MATHEMATICS STUDIES TO DEVELOP DIGITAL SKILLS OF UNDERGRADUATE ENGINEERING STUDENTS  
**Eve Aruvee, Anna Vintere**  
*Estonian University of Life Sciences, Estonia; Latvia University of Life Sciences and Technologies, Latvia*
- 15:40 RELATIONS BETWEEN TEACHERS OF AGRICULTURAL AND OTHER UNIVERSITIES, AND AUTHORITIES OF UKRAINE DURING THE SECOND HALF OF THE 1950S - THE MIDDLE OF THE 1960S  
**Oksana Bulgakova**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine*
- 16:00 COFFEE BREAK

#### Section 4: Engineering economics and engineering education

---

- 16:30 PROGRAMMING OF PEDAGOGICAL TECHNOLOGY FOR FORMATION OF PROFESSIONAL COMPETENCE WHEN STUDYING NATURAL AND GENERAL TECHNICAL DISCIPLINES  
**Stanislav Nikolaenko, Vladymyr Ivanyshyn, Oksana Bulgakova, Lesya Zbaravska, Valentina Vasileva, Mykhailo Torchuk, Ilmars Dukulis**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Podillia State University, Ukraine; University of Ruse Angel Kanchev, Bulgaria; Latvia University of Life Sciences and Technologies, Latvia*
- 16:50 INTER-SUBJECT RELATIONS RESEARCH IN PROFESSIONAL STUDIES OF FUTURE AGRICULTURAL ENGINEERS  
**Stanislav Nikolaenko, Vladymyr Ivanyshyn, Oksana Bulgakova, Lesya Zbaravska, Mykhailo Torchuk, Kaspars Vartukapteinis, Ilmars Dukulis**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Podillia State University, Ukraine; Latvia University of Life Sciences and Technologies, Latvia*
- 17:10 INTEGRATION-LIFELONG EDUCATIONAL SPACE IN FORMATION OF COMPETENT AGRICULTURAL ENGINEER  
**Stanislav Nikolaenko, Vladymyr Ivanyshyn, Vasyl Shynkaruk, Oksana Bulgakova, Lesya Zbaravska, Valentina Vasileva, Ilmars Dukulis**  
*National University of Life and Environmental Sciences of Ukraine, Ukraine; Podillia State University, Ukraine; University of Ruse Angel Kanchev, Bulgaria; Latvia University of Life Sciences and Technologies, Latvia*

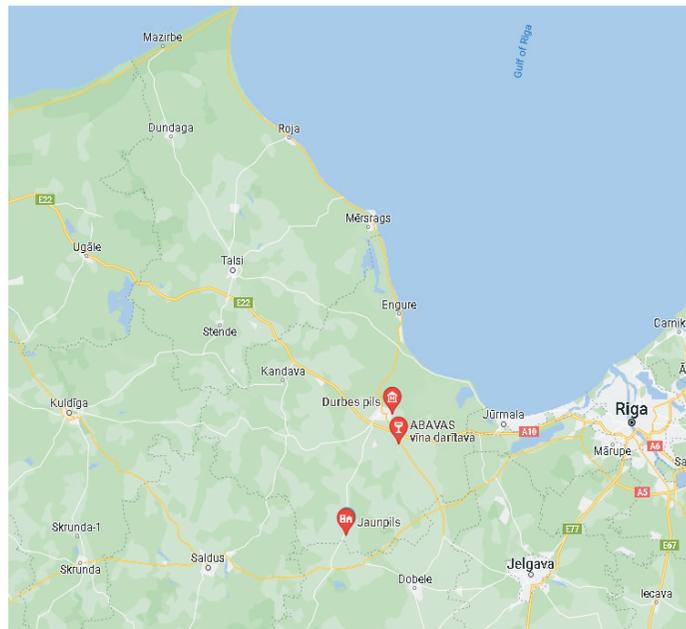
## Social tour

### Friday, May 24

8<sup>15</sup> – 16<sup>30</sup>

**Social tour.** Departure from 5 J. Cakstes blvd., main entrance.

**Kurzeme** is great! It owns the longest sea shore in Latvia and the most beautiful swamps, the greenest forests and the most flowering meadows. Kurzeme is rich because it was once a duchy. Its in the landscape stands out peculiar country manors and manor houses, from white churches are already visible from afar, with stories standing out urban and rural museums. Kurzeme is delicious! Here you will enjoy both the benefits of the countryside, both coastal delicacies, dishes based on tradition and created with a modern taste. Kurzeme makes it great and delicious those people who know how to take what it offers from nature, and turned into a very special, unique product masterpiece. The greatness of Kurzeme can be felt everywhere! It remains to be seen feel, touch and taste.



## Social tour

**Medieval Castle Jaunpils.** It includes the medieval Jaunpils Castle and the surrounding complex a church, a watermill and the Swedish Wall, behind which operates the Medieval Courtyard "Niedru Iija", which offers various medieval entertainment opportunities



**Durbe Castle.** Durbe Castle is one of the most interesting classicism style castles in Kurzeme. **Abavas Winery.** Latvia's largest winery offering wine tasting tours, guests

**Abavas Winery.** Latvia's largest winery offering wine tasting tours, guests also have the option to stop by and purchase wine



**Address**

---

**Address of the Conference Committee**

Faculty of Engineering  
Latvia University of Life Sciences and Technologies  
5 J. Cakstes blvd., Jelgava, LV-3001, Latvia  
Aivars Aboltins  
Phone: + 371 29134846  
E-mail: aivars.aboltins@llu.lv, janis.palabinskis@llu.lv  
<http://www.tf.llu.lv/conference/>