

Latvia University of Agriculture  
Faculty of Engineering  
Latvian Academy of Agricultural and Forestry Sciences



15<sup>th</sup> International Scientific Conference

# ENGINEERING FOR RURAL DEVELOPMENT

PROGRAMME



Jelgava, Latvia, May 25 – 27, 2016

## ***PROGRAM COMMITTEE***

***Chairman:*** Aivars Aboltins, Latvia University of Agriculture, Latvia

***Members:*** Valeriy Adamchuk, National Academy of Agrarian Science of Ukraine (NAASU), Ukraine  
Andres Annuk, Estonian University of Life Sciences, Estonia  
Milan Brozek, Czech University of Life Sciences Prague, Czech Republic  
Marek Gaworski, Warsaw University of Life Science, Poland  
Semjons Ivanovs, Latvia University of Agriculture, Latvia  
Algirdas Jasinskas, Aleksandras Stulginskis University, Lithuania  
Pavel Kic, Czech University of Life Sciences Prague, Czech Republic  
Nikolai Morozov, All-Russia Scientific-Research Institute of Life-stock Farming  
Mechanization, Russia  
Juri Olt, Estonian University of Life Sciences, Estonia  
Vladimir Peredna, Scientific and Practical Centre of the National Academy of Sciences of  
Belarus for Agriculture Mechanization, Belarus  
Simon Popescu, Transylvania University of Brasov, Romania  
Juris Priekulis, Latvia University of Agriculture, Latvia  
Vaclav Romaniuk, Institute of Technology and Life Sciences, Poland  
Stasys Slavinskas, Stulginskis University, Lithuania  
Kaspars Vartukapteinis Latvia University of Agriculture, Latvia  
Yang Zhang, University of Sheffield, United Kingdom

## ***ORGANISING COMMITTEE***

***Chairman:*** Janis Palabinskis, Latvia University of Agriculture, Latvia

***Members:*** Aivars Aboltins, Latvia University of Agriculture, Latvia  
Dainis Berjoza, Latvia University of Agriculture, Latvia  
Baiba Briede, Latvia University of Agriculture, Latvia  
Ilmars Dukulis, Latvia University of Agriculture, Latvia  
Ainars Galins, Latvia University of Agriculture, Latvia  
Imants Nulle, Latvia University of Agriculture, Latvia  
Vitalijs Osadcuks, Latvia University of Agriculture, Latvia  
Semjons Ivanovs, Latvia University of Agriculture, Latvia

***ABSTRACTED AND INDEXED:*** Elsevier SCOPUS, Thomson Reuters Web of Science, AGRIS, CAB Abstracts, CABI full text, EBSCO Academic Search Complete, EBSCO Central & Eastern European Academic Source, Agricola.

***ONLINE:*** Proceedings *ENGINEERING FOR RURAL DEVELOPMENT* will be available online at <http://tf.llu.lv/conference/proceedings2016/>

## Wednesday, 25 May

**16<sup>00</sup> – 18<sup>00</sup>** Registration, welcome party, coffee and snacks,  
Faculty of Engineering, LUA, 5 J. Cakstes blvd., 2<sup>nd</sup> floor, Room 254  
**20<sup>00</sup>** “Carnival Youth” free entrance summer concert at Jelgava palace park

## Thursday, 26 May

**9<sup>00</sup> – 10<sup>00</sup>** Registration of participants,  
Jelgava palace, LUA, Liela street 2, vestibule of Aula,  
**10<sup>00</sup> – 12<sup>10</sup>** Opening of the conference and plenary session  
Jelgava palace, LUA, Liela street 2, Aula  
**Chairman:** Dr.sc.ing. Aivars Aboltins, Latvia University of Agriculture  
**Vice-chairman:** Dr.sc.ing. Janis Palabinskis, Latvia University of Agriculture

<b>10<sup>00</sup> – 10<sup>05</sup></b>	WELCOME SPEECH <b>Irina Pilvere</b> <i>Rector, Latvia University of Agriculture</i>
<b>10<sup>05</sup> – 10<sup>10</sup></b>	OPENING WELCOME <b>Ilmars Dukulis</b> <i>Dean of the Faculty of Engineering, Latvia University of Agriculture</i>
<b>10<sup>10</sup> – 10<sup>40</sup></b>	ECOLOGICAL EFFECT OF ELECTRIC VEHICLES ON CO <sub>2</sub> EMISSIONS IN LATVIA <b>Dainis Berjoza, Inara Jurgena</b> <i>Latvia University of Agriculture, Latvia</i>
<b>10<sup>40</sup> – 11<sup>10</sup></b>	PROPERTIES OF LONG FLAX FIBER REINFORCED NONWOVEN AND COMPOSITE MATERIALS <b>Arta Seile, Dana Belakova</b> <i>Riga Technical University, Latvia</i>
<b>11<sup>10</sup> – 11<sup>40</sup></b>	ASSESSMENT OF KEY ASPECTS OF TECHNOLOGIES AND COW FARMING FOR MILK PRODUCTION IN LATVIA <b>Aleksejs Nipers, Irina Pilvere, Anda Valdovska, Liga Proskina</b> <i>Latvia University of Agriculture, Latvia</i>
<b>11<sup>40</sup> – 12<sup>10</sup></b>	INSTRUMENTATION OF CETANE NUMBER RESEARCH ENGINE <b>Maris Gailis, Marcis Jansons, Janis Rudzitis, Juris Kreicbergs</b> <i>Latvia University of Agriculture, Latvia; Riga Technical University, Latvia</i>

**12<sup>15</sup> – 13<sup>00</sup>** Photo, Lunch  
**13<sup>00</sup> – 15<sup>00</sup>** Work in sections, 5 J. Cakstes blvd.  
**15<sup>30</sup> – 16<sup>00</sup>** Coffee break, 5 J. Cakstes blvd., Room 254  
**16<sup>00</sup> – 18<sup>30</sup>** Work in sections, 5 J. Cakstes blvd.  
**Regulations:** *Presentations – 10 minutes*  
*Discussions – 5 minutes*  
**19<sup>00</sup>** Conference dinner. Live music by ensemble Medem –popular compositions from  
a variety of styles.  
5 J. Cakstes blvd., Room 254

Conference languages – **English, Russian, Latvian**

## Section 1: HUSBANDRY, CONSTRUCTIONS AND MODELING

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5 J.Cakstes blvd., Room 212

Chairman: Dr.hab.sc.ing. **Marek Gaworski**, *Warsaw University of Life Science, Poland*

Vice-chairman: Dr.sc.ing. **Aivars Aboltins**, *Latvia University of Agriculture, Latvia*

- 1 TECHNOLOGICAL AND ECONOMIC ASPECTS OF MEAT CATTLE FARMING IN LATVIA  
**Irina Pilvere, Liga Proskina, Aleksejs Nipers**  
*Latvia University of Agriculture, Latvia*
- 2 EFFECT OF MANAGEMENT PRACTICES ON TIME SPENT BY COWS IN WAITING AREA BEFORE MILKING  
**Marek Gaworski, Aguida Garreth Ferraz Rocha**  
*University Federal of Uberlandia, Brazil; Warsaw University of Life Sciences, Poland*
- 3 RESEARCH IN FARM ANIMAL BREEDING TECHNOLOGICAL PARAMETERS  
**Armins Laurs, Juris Priekulis, Zigurds Markovics, Aivars Aboltins**  
*Latvia University of Agriculture, Latvia; Riga Technical University, Latvia*
- 4 ANALYSIS OF HEATING AND COOLING DAYS FOR BROILER HOUSING IN GAP REGION: EUPHRATES BASIN CASE  
**Atilgan Atilgan, Ali Yucel, Hasan Oz, Yusuf Aydin**  
*Osmaniye Korkut Ata University, Turkey; Siirt University, Turkey; Suleyman Demirel University, Turkey*
- 5 DUST POLLUTION IN BUILDINGS FOR HOUSING OF MEAT CHICKENS  
**Pavel Kic**  
*Czech University of Life Sciences Prague, Czech Republic*
- 6 QUALITY EVALUATION OF FATTENING LAMBS USING ULTRASONIC SCANNER  
*MINDRAY DP-50 VET*  
**Daina Kairisa, Dace Barzdina**  
*Latvia University of Agriculture, Latvia*
- 7 AMOUNT OF NITROGEN IN CATTLE MANURE  
**Elita Aplocina, Aivars Aboltins, Juris Priekulis**  
*Latvia University of Agriculture, Latvia*
- 8 MODEL OF PRICE VOLATILITY RISK MANAGEMENT FOR FIRM WITH PERFECTLY STRUCTURED TECHNOLOGY  
**Andrejs Jaunzems, Ilze Balode**  
*Ventspils University College, Latvia*
- 9 MODELLING OF SAPROPEL FLOW USING SOLIDWORKS SIMULATION TOOLS  
**Roberts Vanags, Daina Kanaska**  
*Latvia University of Agriculture, Latvia*
- 10 MILKING MACHINE WITH ELECTROPULSATOR  
**Vitaly Grinchenko, Gennady Nikitenko, Alexander Lysakov, Evgeny Konoplev**  
*Stavropol State Agrarian University, Russia*
- 11 COLLINEAR FORCE AND FREQUENCY ANALYSIS OF A VIADUCT PILE FOUNDATION CONSTRUCTION PROJECT: A CASE STUDY ON THE APPLICATION OF BIM TECHNOLOGY  
**Lancine Doumbouya, Changsheng Guanb, Sixiang Dengc, Guoping Gaod**  
*Wuhan University of Technology, P.R. China*

- 12 SUSTAINABLE CONSTRUCTION IN LATVIA - OPPORTUNITIES AND CHALLENGES**  
**Sandra Gusta**  
*Latvia University of Agriculture, Latvia*
- 13 SOCIAL ASPECTS OF MULTI-FAMILY APARTMENT BUILDING RENOVATION**  
**Mara Laizane, Ilze Vardanjana, Ilona Laizane**  
*NGO Building and Energy Conservation Bureau, Latvia; Riga Teacher Training and Education Management Academy, Latvia*
- 14 FEM NUMERICAL ANALYSIS OF TOOL HOLDER OF TURNING LATHE**  
**Andrius Senkus, Egle Jotautiene**  
*Aleksandras Stulginskis University, Lit*
- 15 BARK EFFECT ON WOOD DRYING DYNAMICS**  
**Aivars Aboltins, Pavel Kic**  
*Czech University of Life Sciences Prague, Czech Republic; Latvia University of Agriculture, Latvia*
- 16 ON MATHEMATICAL MODELLING OF HEAT AND MOISTURE DISTRIBUTION IN POROUS MULTILAYER MEDIA**  
**Aivars Aboltins, Harijs Kalis, Ilmars Kangro**  
*Latvia University of Agriculture, Latvia; Rezekne Academy of Technologies, Latvia; University of Latvia, Latvia*
- 17 MATHEMATICAL MODELLING AND EXPERIMENTAL STUDY OF ELECTRODYNAMIC CONTROL OF SWIRLING FLAME FLOWS**  
**Harijs Kalis, Inesa Barmina, Maija Zake, Andrejs Koliskins**  
*Riga Technical University, Latvia; University of Latvia, Latvia*
- 18 MANAGEMENT OF MANURE FROM LIVESTOCK HOUSING IN TIGRIS BASIN AND ITS ENVIRONMENTAL POTENTIAL IMPACT**  
**Atilgan Atilgan, Burak Saltuk, Hasan Oz, Ozan Artun**  
*Süleyman Demirel University, Turkey; Siirt University, Turkey; Cukurova University, Turkey; Vocational School of Karaisali, Turkey*

## Section 2: SOIL TREATMENT AND ENGINEERING TECHNOLOGIES

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J. Cakstes blvd., Room 429

Chairman: Dr.sc.ing. **Kestutis Romaneckas**, *Aleksandras Stulginskis University, Lithuania*

Vice-chairman: Dr.sc.ing. **Semjons Ivanovs**, *Latvia University of Agriculture, Latvia*

- 1 MEASUREMENT OF ELECTRICAL CONDUCTIVITY OF FERTILIZER NPK 20-8-8  
**Josef Krupicka, Petr Sarec, Petr Novak**  
*Czech University of Life Sciences Prague, Czech Republic*
- 2 INVESTIGATION OF HEMP (*CANNABIS SATIVA L.*) MORPHOLOGICAL PARAMETERS AS INFLUENCED BY SEED RATE AND GENOTYPE  
**Zofija Jankauskiene, Elvyra Gruzdeviene, Semjons Ivanovs, Ernestas Maumevicius**  
*Aleksandras Stulginskis University, Lithuania; Latvia University of Agriculture, Latvia; Lithuanian Research Centre for Agriculture and Forestry, Lithuania*
- 3 EFFECT OF PLOWING AND DEEP LOOSENING ON CONE INDEX AND WATER FLOW  
**Milan Kroulik, Vaclav Brant, Jan Chyba, Petr Zabransky**  
*Czech University of Life Sciences Prague, Czech Republic*
- 4 INFLUENCE OF DIFFERENT TRESHING SYSTEM DESIGN ON GRAIN DAMAGE  
**Jiri Masek, Frantisek Kumhala, Petr Novak, Tomas Fic**  
*Czech University of Life Sciences Prague, Czech Republic*
- 5 IMPACT OF SUBSOILING AND SCATTERED SOWING ON SOME SOIL PHYSICAL PROPERTIES AND WHEAT PRODUCTIVITY  
**Kestutis Romaneckas, Egidijus Sarauskis, Antanas Sakalauskas, Algirdas Jasinskas**  
*Aleksandras Stulginskis University, Lithuania*
- 6 INFLUENCE OF HARVEST TIME OF *ARTEMISIA DUBIA* WALL. PROPERTIES  
**Zivile Cerniauskiene, Algirdas Raila, Egidijus Zvicevicius, Zydre Kadziuliene, Vita Tilvikiene**  
*Aleksandras Stulginskis University, Lithuania; Lithuanian Research Centre for Agriculture and Forestry, Lithuania*
- 7 EVALUATION OF SOIL TILLAGE TECHNOLOGIES IN TERMS OF SOIL PARTICLE TRANSFER  
**Josef Hula, Petr Novak**  
*Czech University of Life Sciences Prague, Czech Republic*
- 8 RESEARCH IN CLEANING AND SORTING OF ECOLOGICALLY GROWN WHITE MUSTARD SEED  
**Anicetas Straksas, Dainius Steponavicius, Rolandas Domeika, Tadas Katkevicius**  
*Aleksandras Stulginskis University, Lithuania*
- 9 INFLUENCE OF PORE SIZE DISTRIBUTION ON PENETRATION RESISTANCE BEHAVIOUR AND DRY DENSITY OF CLAY-LOAM SOIL  
**Patrik Prikner, Radka Kodesova**  
*Czech University of Life Sciences Prague, Czech Republic*
- 10 VINEYARD FLOOR MANAGEMENT WITH NOVEL FREE-ACTIVE INTER-ROW TILLER  
**Tatevik Yezekyan, Juri Olt**  
*Armenian National Agrarian University, Armenia; Estonian University of Life Sciences, Estonia*
- 11 INVESTIGATIONS IN SUITABILITY OF FLEET OF COMBINES FOR TIMELY HARVESING  
**Dainis Viesturs, Nikolajs Kopiks**  
*Latvia University of Agriculture, Latvia*

- 12** EFFECT OF SOIL PH ON REASONABLE TRAVEL SPEED OF MOBILE UNIT AND LIME APPLICATION  
**Dainius Steponavicius, Aurelija Kemzuraite, Remigijus Zinkevicius, Tadas Bartkus**  
*Aleksandras Stulginskis University, Lithuania*
- 13** WEAR OF PLOUGH CHISEL DURING PROCESSING OF PODZOLIC SOIL  
**Martins Ziemelis, Gunars Verdins**  
*Latvia University of Agriculture, Latvia*
- 14** IMPACT OF SOIL TILLAGE TECHNOLOGY ON EROSION PARAMETERS IN CENTRAL BOHEMIA REGION  
**Petr Novak, Jiri Masek, Josef Hula**  
*Czech University of Life Sciences Prague, Czech Republic*
- 15** INVESTIGATIONS IN TECHNOLOGICAL METHOD OF GROWING POTATOES UNDER MULCH OF STRAW AND ITS EFFECT ON THE YIELD  
**Valeriy Adamchuk, Viktor Prisyazhnyi, Semjons Ivanovs, Volodimir Bulgakov**  
*Latvia University of Agriculture, Latvia; National Scientific Centre "Institute for Agricultural Engineering and Electrification" of Ukraine, Ukraine; National University of Life and Environmental Sciences of Ukraine, Ukraine*
- 16** INFLUENCE OF NITROGEN FERTILIZERS ON CHEMICAL COMPOSITION OF ENERGY GRASS  
**Aleksandrs Adamovics, Rasma Platace, Semjons Ivanovs**  
*Latvia University of Agriculture, Latvia*
- 17** DETERMINATION OF LEVEL OF FERTILIZER USAGE IN GREENHOUSES IN MUGLA REGION  
**Ibrahim Demirbilek, Atilgan Atilgan**  
*Suleyman Demirel University, Turkey*
- 18** STUDY OF SOIL STRATUM DEFORMATION BY DISC CULTIVATOR  
**Ayrat Valiev, Farzutdin Muhamadyarov**  
*Kazan State Agrarian University, Russia; Vyatka State University, Russia*
- 19** PERFORMANCES EVALUATION OF DIRECT SEEDER FOR GRASSLANDS  
**Manea Dragos, Voicu Gheorghe, Paraschiv Gigel, Marin Eugen**  
*National Institute of Research-Development for Machines and Installations Designed to Agriculture and Food Industry, Romania; University Politehnica of Bucharest, Romania*
- 20** RESEARCHES CONCERNING IMPURITIES SEPARATION PROCESS FROM MASS OF CEREAL SEEDS USING VIBRATING SIEVES IN AIR FLOW CURRENTS  
**Carmen Bracacescu, Iuliana Gageanu, Simion Popescu, Kemal Cagatay Selvi**  
*National Institute of Research-Development for Machines and Installations Designed to Agriculture and Food Industry, Romania; Ondokuz Mayıs University, Turkey; Transilvania University of Brasov, Romania*

### Section 3: MOTOR VEHICLES AND FUELS

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5 J. Cakstes blvd., Room 431

Chairman: Dr.sc.ing. **Gints Birzietis**, *Latvia University of Agriculture, Latvia*

Vice-chairman: Dr.sc.ing. **Dainis Berjoza**, *Latvia University of Agriculture, Latvia*

- 1 MICROCLIMATE CONDITIONS AND STRESS FACTORS EFFECTING FARM MACHINE OPERATORS DURING HARVEST  
**Retta Zewdie, Pavel Kic**  
*Czech University of Life Sciences Prague, Czech Republic*
- 2 INFLUENCE OF INFLATION PRESSURE IN TIRES ON TRACTION RATIO 2WD AND 4WD DRIVING MODES OF TRACTOR  
**Vaclovas Kurkauskas, Algirdas Janulevicius, Gediminas Pupinis**  
*Aleksandras Stulginskis University, Lithuania*
- 3 EXPERIMENTAL AND COMPUTATIONAL REASERCH OF NEW FILTER INNER LINEAR DESIGN  
**Darius Mazeika, Algimantas Bubulis, Audrius Bartkus, Arvydas Pauliukas, Martynas Lendraitis, Dalia Nizeviciene**  
*Aleksandras Stulginskis University, Lithuania; Kaunas University of Technology, Lithuania; UAB "MATURE", Lithuania*
- 4 MECHANISM MOTION STUDIES WITH COLLISIONS AT SEVERAL POINTS  
**Edgars Kovals, Janis Viba, Lauris Stals, Svetlana Sokolova, Vitaly Krupenin**  
*A. Blagonravov Institute of Machines Science of the Russian Academy of Sciences, Russia; Riga Technical University, Latvia*
- 5 INFLUENCE OF INTAKE AIR TEMPERATURE AND EXHAUST GAS RECIRCULATION ON HCCI COMBUSTION PROCESS USING BIOETHANOL  
**Kastytis Laurinaitis, Stasys Slavinskas**  
*Aleksandras Stulginskis University, Lithuania*
- 6 COMPLETE AUTOMATION OF ASSEMBLY PROCESS FOR CYLINDRICAL PARTS WITH USING VIBRATIONS  
**Natalija Mozga, Ivans Grinevichs**  
*Riga Technical University, Latvia*
- 7 EXPERIMENTAL INVESTIGATION OF EFFECTIVENESS OF ELECTRIC VEHICLE VACUUM BRAKE BOOSTER ON POWER TEST BENCH  
**Dainis Berjoza, Vilnis Pirs, Ilmars Dukulis**  
*Latvia University of Agriculture, Latvia*
- 8 RFID APPLICATION FOR ELECTRIC CAR IDENTIFICATION AT THE CHARGING STATION  
**Ainars Galins, Pauls Beinarovics, Aigars Laizans, Arvids Jakusenoks**  
*Latvia University of Agriculture, Latvia; Road Traffic Safety Directorate, Latvia*
- 9 EVALUATION OF WOOD AND PEAT MIXTURE BIOFUEL CHARACTERISTICS  
**Algirdas Jasinskas, Vytautas Kucinskas, Imants Ziemelis, Egle Jotautiene**  
*Aleksandras Stulginskis University, Lithuania; Latvia University of Agriculture, Latvia*
- 10 KINEMATIC DISCREPANCY AND MOVING RESISTANCE DEPENDENCE ON TIRES AIR PRESSURE IN 4X4 TRACTORS  
**Povilas Gurevicius, Algirdas Janulevicius, Gediminas Pupinis**  
*Aleksandras Stulginskis University, Lithuania*

- 11** NUMERICAL AND EXPERIMENTAL ANALYSES OF INJECTION CHARACTERISTICS USING JET FUEL  
**Tomas Mickevicius, Stasys Slavinskas, Ricardas Uzelka, Valentina Vilutiene**  
*Aleksandras Stulginskis University, Lithuania; The General Jonas Zemaitis Military Academy of Lithuania, Lithuania*
- 12** NUMERICAL MODEL OF COMMON RAIL ELECTROMAGNETIC FUEL INJECTOR  
**Stasys Slavinskas, Gvidonas Labeckas, Irena Kanapkiene, Tomas Mickevicius**  
*Aleksandras Stulginskis University, Lithuania*
- 13** PIPE LINE SEGMENT SQUEEZING BY REACTIVE LOAD DUE TO FLOWING OUT  
**Alexander Sergeyev**  
*Institute of Problems of Mechanical Engineering RAS, Russia*
- 14** SPECIAL MONITORING DEVICE FOR EVALUATION OF DRIVING STYLE OF CAR DRIVERS  
**Mario Szabo, Radoslav Majdan, Stanislav Lindak, Vladislav Hajdak**  
*Slovak University of Agriculture in Nitra, Slovakia*
- 15** AMOUNT OF TOXIC EXHAUST GASES EMITTED DURING ENGINE WARM UP  
**Aivars Birkavs, Ilmars Dukulis**  
*Latvia University of Agriculture, Latvia*
- 16** BIODIESEL IMPACT ON DIESEL ENGINE HIGH PRESSURE PUMP PLUNGER PAIRS  
**Aivars Birkavs, Aivars Kakitis, Ilmars Dukulis**  
*Latvia University of Agriculture, Latvia*
- 17** COMPARISON OF GROUND AND UNDERGROUND ROUTES BY ANALYSING OPERATING PARAMETERS OF DRIVEN VEHICLE  
**Martin Kotek, Miroslav Ruzicka, Petr Jindra, Jakub Marik**  
*Czech University of Life Sciences Prague, Czech Republic*
- 18** ASSESSMENT OF THE ECONOMY OF MUNICIPAL BUS OPERATION  
**Stanislav Lindak, Peter Kuchar, Marek Halenar, Vladislav Hajdak**  
*Slovak University of Agriculture in Nitra, Slovakia*
- 19** EFFICIENT TRANSPORTATION IN CITIES AND PERISHABLE GOODS SECONDARY PACKAGING  
**Pavels Patlins**  
*Riga Technical University, Latvia*

## Section 4: ENERGETICS AND AUTOMATIZATION

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5 J. Cakstes blvd., Room 403

Chairman: Dr.sc.ing. **Aigars Laizans**, *Latvia University of Agriculture, Latvia*

Vice-chairman: Dr.sc.ing. **Agris Nikitenko**, *Riga Technical University, Latvia*

- 1 PRODUCTION QUALITY DECISION SUPPORT USING REAL-TIME COMPUTER VISION FRAMEWORK  
**Harijs Grinbergs**  
*Riga Technical University, Latvia*
- 2 DETERMINATION OF RAPESEED (*BRASSICA NAPUS*) DIMENSIONS AND SHAPE BY IMAGE ANALYSIS  
**David Herak, Ruslan Askarbekov**  
*Czech University of Life Sciences Prague, Czech Republic*
- 3 MONITORING TECHNIQUE OF ENERGY AND ECOLOGICAL EFFICIENCY OF INDOOR PLANT LIGHTING  
**Sergey Rakutko, Elena Rakutko, Dmitriy Kaposenko, Alexander Vaskin**  
*Institute for Engineering and Environmental Problems in Agricultural Production, Russia; Saint-Petersburg State Agrarian University, Russia*
- 4 DECISION TABLE SYNTHESIS IN FUZZY ENVIRONMENT FOR INDUSTRIAL ROBOT - TELPHER  
**Kristine Mezale, Andris Kundzins, Zigurds Markovics**  
*Riga Technical University, Latvia*
- 5 PARAMETRIC OPTIMIZATION OF ENERGY CONVERSION SYSTEMS BASED ON THERMO ECONOMIC INDICATORS  
**Irina Belinskaia, Dmitriy Agapov**  
*Saint-Petersburg State Agrarian University, Russia*
- 6 INVESTIGATION OF AIR HEATING SOLAR COLLECTOR WITH ENERGY CONCENTRATOR  
**Imants Ziemelis, Henriks Putans, Algirdas Jasinskas, Liene Kancevica**  
*Aleksandras Stulginskis University, Lithuania; Latvia University of Agriculture, Latvia*
- 7 SIMPLE METHOD OF LIDAR POINT DENSITY DEFINITION FOR AUTOMATIC BUILDING RECOGNITION  
**Sergejs Kodors, Ilmars Kangro**  
*Rezekne Academy of Technologies, Latvia*
- 8 BIOMETRIC SYSTEMS BASED ON FACIAL FEATURES AND THEIR RELIABILITY  
**Veronika Hartova, Jan Hart**  
*Czech University of Life Sciences Prague, Czech Republic*
- 9 RISK OF WIRING OF BIOMETRIC IDENTIFICATION SYSTEMS  
**Veronika Hartova, Jan Hart**  
*Czech University of Life Sciences Prague, Czech Republic*
- 10 MOBILE ROBOT CAMERA EXTRINSIC PARAMETERS AUTO CALIBRATION BY SPIRAL MOTION  
**Martins Ekmanis, Agris Nikitenko**  
*Riga Technical University, Latvia*
- 11 LOW-VOLTAGE CIRCUIT BREAKERS SELECTIVITY STUDIES  
**Aleksejs Gedzurs, Indulis Straume, Ainars Galins, Aigars Laizans**  
*Latvia University of Agriculture, Latvia*

- 12** NEW DEVICES FOR ENERGY EXTRACTION FROM AIR FLOW  
**Janis Viba, Stanislavs Noskovs, Vitaly Beresnevich, Janis Dobelis**  
*Riga Technical University, Latvia*
- 13** DOUBLE PENDULUM MOTION ANALYSIS IN VARIABLE FLUID FLOW  
**Oskars Ozolins, Valters Cipruss, Janis Viba, Olegs Jakovlevs**  
*Riga Technical University, Latvia*
- 14** PRACTICAL USE OF SOLAR COLLECTOR INTEGRATED IN COMBINED HEATING SYSTEM  
**Ilze Pelece, Uldis Gross**  
*Latvia University of Agriculture, Latvia*
- 15** IMAGE RECOGNITION WITH HARDWARE NEURAL NETWORKS  
**Karlis Berkolds**  
*Riga Technical University, Latvia*
- 16** NUMERICAL AND EXPERIMENTAL INVESTIGATION OF H-DARRIEUS VERTICAL AXIS WIND TURBINE  
**Normunds Jekabsons, Sabine Upnere, Janis Kleperis, Janis Kleperis**  
*Institute of Solid State Physics, Latvia; SIA "Multipla Energy", Latvia; Ventspils University College, Latvia*
- 17** ULTRACAPACITOR BASED STORAGE SYSTEM FOR LEAD-ACID POWERED LIGHT ELECTRIC VEHICLE RETROFIT  
**Kaspars Kroics, Viesturs Brazis**  
*Riga Technical University, Latvia*
- 18** USING WIRELESS CHARGING TO PROLONG LEAD-ACID BATTERY LIFETIME  
**Aivars Rubenis, Aigars Laizans, Dainis Berjoza**  
*Latvia University of Agriculture, Latvia; SIA "TransfoElectric", Latvia*
- 19** INVESTIGATION OF THE ELECTRICAL PARAMETERS FOR A PCB TRANSFORMER  
**Janis Voitkans, Leslie R. Adrian, Donato Repole**  
*Riga Technical University, Latvia*
- 20** SOFTWARE FOR BIOLOGICAL DATA STORAGE AND SEQUENCE COMPARISON  
**Janis Eiduks, Liga Paura**  
*Latvia University of Agriculture, Latvia*

## Section 5: BIOMASS CONDITIONING AND AGRICULTURAL EMISSION

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5 J. Cakstes blvd., Room 410

Chairman: Dr.sc.ing. **Egle Jotautiene**, *Aleksandras Stulginskis University, Lithuania*  
Vice-chairman: Dr.oec. **Ligita Melece**, *Institute of Agricultural Resources and Economics, Latvia*

- 1 COMBINATION OF WIND POWER PLANTS AND DISTRICT HEATING SYSTEMS - TECHNICAL, ECONOMIC AND ENVIRONMENTAL ASPECTS  
**Ilze Priedite, Gatis Bazbauers**  
*Institute of Physical Energetics, Latvia; Riga Technical University, Latvia*
- 2 INVESTIGATION OF NATURAL MAGNESIUM MINERAL FERTILIZER GRANULATION AND DETERMINATION OF GRANULE QUALITATIVE INDICATORS  
**Algirdas Jasinskas, Juozas Pekarskas, Vytautas Kucinskas, Aivars Aboltins**  
*Aleksandras Stulginskis University, Lithuania; Latvia University of Agriculture, Latvia*
- 3 FERTILIZED SHORT ROTATION PLANTATIONS OF HYBRID ASPEN (*POPULUS TREMULOIDES* MICHX. – x *POPULUS TREMULA* L.) FOR ENERGY WOOD OR MITIGATION OF GHG EMISSIONS  
**Arta Bardule, Andis Lazdins, Toms Sarkanabols, Dagnija Lazdina**  
*Latvian State Forest Research Institute "Silava", Latvia; University of Latvia, Latvia*
- 4 INVESTIGATION OF PHYSICAL-MECHANICAL PROPERTIES OF EXPERIMENTAL ORGANIC GRANULAR FERTILIZERS  
**Antanas Pocius, Egle Jotautiene, Juozas Pekarskas, Mecys Palsauskas**  
*Aleksandras Stulginskis University, Lithuania*
- 5 CUTTING ENERGY ASSESSMENT OF HEMP STRAW  
**Aivars Kakitis, Roberts Berzins, Uldis Berzins**  
*Latvia University of Agriculture, Latvia*
- 6 MECHANICAL DURABILITY OF DIGESTATE BRIQUETTES MIXED WITH MINERAL ADDITIVES  
**Anna Brunerova, Tatiana Ivanova, Milan Brozek**  
*Czech University of Life Sciences Prague, Czech Republic*
- 7 RHOMBUS BRIQUETTING MECHANISM MODELING  
**Edgars Repsa, Eriks Kronbergs**  
*Latvia University of Agriculture, Latvia*
- 8 BIOGAS POTENTIAL ASSESSMENT FROM BEER AND SUGAR PRODUCING FACTORIES WASTE  
**Vilis Dubrovskis, Imants Plume**  
*Latvia University of Agriculture, Latvia*
- 9 PRODUCTION OF REED CANARY GRASS-WOOD PELLETS  
**Rasma Platace, Aleksandrs Adamovics, Janis Kalnacs**  
*Institute of Physical Energetics, Latvia; Latvia University of Agriculture, Latvia*
- 10 CHALLENGES AND OPPORTUNITIES OF CIRCULAR ECONOMY AND GREEN ECONOMY  
**Ligita Melece**  
*Institute of Agricultural Resources and Economics, Latvia*
- 11 BIOENERGY IN LATVIA: SECTOR VALUE AND IMPACTS  
**Ligita Melece, Agnese Krievina**  
*Institute of Agricultural Resources and Economics, Latvia*

- 12** IMPACT OF MELAFEN-METAFORM ADDITIVE ON MAIZE SILAGE ANAEROBIC DIGESTION PROCESS  
**Vilis Dubrovskis, Imants Plume**  
*Latvia University of Agriculture, Latvia*
- 13** EARTHWORM BIOHUMUS CONDITIONING FOR PELLET PRODUCTION  
**Olafs Vronskis, Egils Laukmanis, Aivars Kakitis, Imants Nulle**  
*Latvia University of Agriculture, Latvia; SIA Bioorganic Earthworm Compost, Latvia*
- 14** STRENGTH OF BRIQUETTES AND PELLETS FROM ENERGY CROPS  
**Adam Swietochowski, Aleksander Lisowski, Magdalena Dabrowska-Salwin**  
*Warsaw University of Life Sciences, Poland*
- 15** ANALYSIS OF AGRICULTURAL RUN-OFF MONITORING PROGRAM RESULTS FOR ESTIMATION OF NITROUS OXIDE INDIRECT EMISSIONS IN LATVIA  
**Ritvars Sudars, Laima Berzina, Linda Grinberga**  
*Latvia University of Agriculture, Latvia*
- 16** DEVELOPMENT OF COMBUSTION DYNAMICS AT THERMO CHEMICAL CONVERSION OF BIOMASS PELLETS  
**Inesa Barmina, Raimonds Valdmanis, Maija Zake**  
*University of Latvia, Latvia*
- 17** NITROGEN FERTILIZER USE EFFICIENCY AND GHG EMISSIONS IN THE LATVIAN GRAIN SECTOR  
**Arnis Lenerts, Gatis Berzins, Dina Popluga**  
*Latvia University of Agriculture, Latvia; SIA "Precision Farming", Latvia*
- 18** BIOGAS POTENTIAL FROM RESIDUES OF FOOD PROCESSING FACTORIES  
**Vilis Dubrovskis, Imants Plume**  
*Latvia University of Agriculture, Latvia*
- 19** PRESSURE AGGLOMERATION OF BIOMASS WITH ADDITION OF THE CALCIUM CARBONATE  
**Magdalena Dabrowska-Salwin, Aleksander Lisowski, Monika Kostrubiec, Adam Swietochowski**  
*Warsaw University of Life Sciences, Poland*
- 20** RENEWABLE ENERGY RESOURCES EFFECTIVE USE FOR RURAL DEVELOPMENT  
**Peteris Shipkovs, Kristina Lebedeva, Lana Migla, Galina Kashkarova**  
*Institute of Physical Energetics, Latvia*

## Section 6: MATERIAL SCIENCE

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5 J. Cakstes blvd., Room 327

Chairman: Dr.sc.ing. **Daina Kanaska**, *Latvia University of Agriculture, Latvia*

Vice-chairman: Dr. hab.sc.ing. **Tomasz Lipinski**, *University of Warmia and Mazury in Olsztyn, Poland*

- 1 REASONS FOR RAILWAY WEAR AT CURVES  
**Anna Ancevska, Dijs Sergejevs**  
*Riga Technical University, Latvia*
- 2 SURFACE MODELLING BASED ON UNMANNED AERIAL VEHICLE PHOTOGRAMMETRY AND ITS ACCURACY ASSESSMENT  
**Jan Komarek, Jitka Kumhalova, Milan Kroulik**  
*Czech University of Life Sciences Prague, Czech Republic*
- 3 BOUNDARY CONDITIONS INFLUENCE ON COMPRESSIVE STIFFNESS OF ELASTOMERIC ISOLATORS  
**Svetlana Polukoshko, Vladimirs Gonca, Andris Martinovs, Svetlana Sokolova**  
*Rezekne Academy of Technologies, Latvia; Riga Technical University, Latvia; Ventspils University College, Latvia*
- 4 SURFACE ROUGHNESS MEASURE THAT BEST CORRELATES TO EASE OF SLIDING  
**Ernest Jansons, Janis Lungevics, Karlis Agris Gross**  
*Riga Technical University, Latvia*
- 5 RESEARCH AND ANALYSIS OF ABSORBENT HYGIENE PRODUCT (AHP) RECYCLING  
**Anita Gerina-Ancane, Agrita Eiduka**  
*Riga Technical University, Latvia*
- 6 MODIFICATION OF ALSi21CUNI ALLOY BY FAST COOLED ALLOY  
**Tomasz Lipinski**  
*University of Warmia and Mazury in Olsztyn, Poland*
- 7 CORROSION OF THE X2CRNIMOSI18-5-3 DUPLEX STAINLESS STEEL  
**Tomasz Lipinski**  
*University of Warmia and Mazury in Olsztyn, Poland*
- 8 ASSESSMENT OF RAILWAY TURNOUT ELEMENT RESTORATION USING MMA AND FCAW WELDING  
**Dijs Sergejevs**  
*Riga Technical University, Latvia*
- 9 COMPOSITE FIBER PULL-OUT IN CONCRETES WITH VARIOUS STRENGTHS  
**Arturs Lukasenoks, Arturs Macanovskis, Andrejs Krasnikovs, Videvuds Lapsa**  
*Riga Technical University, Latvia*
- 10 INCREASING FIRE PROOFNESS OF SAPROPEL AND HEMP SHIVES INSULATION MATERIAL  
**Stanislavs Pleiksnis, Juris Skujans, Edmunds Visockis, Kristaps Pulkis**  
*Latvia University of Agriculture, Latvia*
- 11 STATIC-DYNAMIC POWDER MATERIAL COMPACTION METHODS  
**Victor Mironov, Pavel Stankevich, Irina Beljaeva, Vladimir Glushenkov**  
*Riga Technical University, Latvia; Samara State Aerospace University, Russia*

- 12** CHANGE OF SELECTED RESULTING PROPERTIES OF ALSI9CUMNNI ALLOY BY HEAT TREATMENT AND ANTIMONY  
**Natasa Naprstkova, Jaromir Cais, Jan Svianek, Helena Cierna**  
*J. E. Purkyne University in Usti nad Labem, Czech Republic; Technical University of Zvolen, Slovakia*
- 13** CHEMICAL COMPOSITION OF DIGESTATE  
**Juris Priekulis, Elita Aplocina, Armins Laurs**  
*Latvia University of Agriculture, Latvia*
- 14** PULLOUT MECHANISM DETAILED MICROMECHANICAL INVESTIGATION IN SITUATION WHEN OUT OF CONCRETEIS PULLING STRAIGHT STEEL FIBER  
**Arturs Macanovskis, Andrejs Krasnikovs, Olga Kononova, Edgars Macanovskis**  
*Riga Technical University, Latvia*
- 15** MECHANICAL PROPERTIES OF THERMAL INSULATING SANDWICH MATERIALS  
**Petr Valasek, Petr Chocholous, Miroslav Muller**  
*Czech University of Life Sciences Prague, Czech Republic*
- 16** CALCULATION OF DEFORMATION OF RUBBER LAYER IN RUBBER METAL ELEMENTS  
**Turatbek Duishenaliev, Ruslan Askarbekov**  
*Czech University of Life Sciences Prague, Czech Republic; Kyrgyz State Technical University, Kyrgyzstan*
- 17** COMPLEX ANALYSIS OF THE QUALITY OF THE NICKEL LAYER OF SCREWS  
**Sylvia Kusmierczak, Lubomir Hodinar**  
*J. E. Purkyne University in Usti nad Labem, Czech Republic*
- 18** STRUCTURAL MONITORING OF EXPERIMENTAL TIMBER-CONCRETE COMPOSITE BRIDGE  
**Raitis Lacis**  
*Forest Sector Competence Centre, Latvia*
- 19** USE OF TREE LEAVES-LIME MIXTURE FOR BUILDING INSULATION  
**Edmunds Visockis, Stanislavs Pleiksnis, Uldis Gross, Godfrids Noviks**  
*Latvia University of Agriculture, Latvia; Rezekne Academy of Technologies, Latvia*

## Section 7: EDUCATION AND MANAGEMENT

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5 J. Cakstes blvd., Room 336

Chairman: Dr.paed. **Baiba Briede**, *Latvia University of Agriculture, Latvia*

Vice-chairman: Dr.oec. **Baiba Rivza**, *Latvia University of Agriculture, Latvia*

- 1 CHALLENGES WITH ENGINEERING EDUCATION FROM THE MARKETING PERSPECTIVE  
**Lasma Dobele, Irina Deicmane, Lana Janmere**  
*Latvia University of Agriculture, Latvia*
- 2 PROCEDURE FOR TESTING JELGAVA SCHOOL WEBSITES ON MOBILE DEVICES USING GOPRO HEAD CAMERA  
**Jekaterina Smirnova, Gatis Vitols**  
*Latvia University of Agriculture, Latvia*
- 3 TECHNICAL AND NATURAL SCIENCES TEACHING AT ENGINEERING FACULTY OF FPTM UJEP  
**Jan Novotny**  
*J. E. Purkyne University in Usti nad Labem, Czech Republic*
- 4 TO SPECIFICITY OF DISCOURSE APPROACH FOR ENGINEERING STUDENTS LISTENING COMPREHENSION TRAINING IN ELT CLASSROOM  
**Elena Boitsova, Natalia Bogach, Karina Vylegzhanina**  
*Peter the Great Saint-Petersburg Polytechnic University, Russia*
- 5 HIGH FREQUENCY WORDS AND FOREIGN LANGUAGE COMPETENCE DEVELOPMENT IN ENGINEERING  
**Tatiana Panysheva**  
*Peter the Great Saint-Petersburg Polytechnic University, Russia*
- 6 COMPETENCE DEVELOPMENT MODEL FOR OCCUPATIONAL SAFETY SPECIALISTS  
**Dace Brizga**  
*Latvia University of Agriculture, Latvia*
- 7 ENGINEERING STUDENTS' SELF-ASSESSMENT OF LEARNING OUTCOMES IN THE CONTEXT OF TRANSFORMATIVE LEARNING  
**Baiba Briede**  
*Latvia University of Agriculture, Latvia*
- 8 SOFTWARE FOR CREATION OF ELECTRONIC MATERIALS  
**Ilze Kazaine**  
*Latvia University of Agriculture, Latvia*
- 9 ENGINEERS' MATHEMATICS EDUCATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT  
**Anna Vintere, Baiba Briede**  
*Latvia University of Agriculture, Latvia*
- 10 IMPROVEMENT OF TEACHING METHODOLOGY OF MATHEMATICS FOR STUDENTS AND PUPILS USING THE MOOC PLATFORM  
**Sarmite Cernajeva, Inta Volodko**  
*Riga Technical University, Latvia*
- 11 PROGRAMMING ENGINEER PROFESSIONAL DEVELOPMENT FROM MULTI-ASPECT VIEW  
**Irena Katane, Regina Baltusite, Edgars Katans**  
*IT company "Autentica", Latvia; Latvia University of Agriculture, Latvia*

- 12** GLOBAL TALENT WAR: DIFFERENCES IN SMALL EMERGING COUNTRY  
**Valdis Avotins, Biruta Sloka, Natalja Jarohnovich**  
*University of Latvia, Latvia; Ventspils University College, Latvia*
- 13** ANALYSIS OF KURZEME REGION DEVELOPMENT IN THE CONTEXT OF SMART SPECIALIZATION STRATEGY: PRELIMINARY RESULTS  
**Karlis Kreslins, Dace Stefenberga**  
*Ventspils University College, Latvia*
- 14** ANALYSIS OF FIRE SAFETY SYSTEMS IN REGIONS OF LATVIA: POSSIBILITY OF BUILDING NEW FIRE STATIONS  
**Jelena Malahova, Baiba Rivza, Daina Vasilevska**  
*Latvia University of Agriculture, Latvia; Liepaja University, Latvia; Riga Technical University, Latvia*
- 15** DYNAMIC MODEL OF ENTERPRENEURIAL UNIVERSITY: CASE OF VENTSPILS UNIVERSITY COLLEGE DEVELOPMENT VISION  
**Juris Roberts Kalnins, Natalja Jarohnovich**  
*Ventspils University College, Latvia*
- 16** LEARNING AND COMPETENCE MANAGEMENT SOLUTION  
**Janis Judrups, Uldis Zandbergs, Maksims Kazakovs**  
*Baltic Computer Academy Ltd, Latvia*
- 17** IMPACT OF COMPETENCE FRAGMENTATION ON EMPLOYEE DEVELOPMENT IN PUBLIC SERVICES IN LATVIA  
**Uldis Zandbergs, Maksims Kazakovs**  
*Baltic Computer Academy Ltd, Latvia*
- 18** COMPETENCE-BASED APPROACH IN HUMAN RESOURCE DEVELOPMENT PLANNING AUTOMATION  
**Maksims Kazakovs**  
*Baltic Computer Academy Ltd, Latvia*
- 19** STUDENT DROPOUT RATE IN ENGINEERING EDUCATION STUDY PROGRAM  
**Liga Paura, Irina Arhipova**  
*Latvia University of Agriculture, Latvia*

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**Ulbroka research center** is founded in 1960 as the Scientific Research Institute for the Mechanization and Electrification of Agriculture, since 1998 incorporated into the Latvia University of Agriculture. It carries out fundamental and material investigations aimed at the improvement of technical means and technological processes in agriculture, estimation of their adequacy and suitability.



<http://www.llu-ltzi.lv/indexeng.htm>

## Friday, 27 May

9<sup>00</sup> -  
18<sup>00</sup>

### ***Social tour***

Departure from 5 J. Cakstes blvd. at 9<sup>00</sup>

#### **SIGULDA**

Located on the both sides of the Gauja valley, Sigulda is one of the most beautiful Latvian towns.



#### **LIVONIAN ORDER SIGULDA CASTLE and CASTLE COMPLEX**

Built in 1207 as a castellum type fortress, later rebuilt into a convent type building. From 2012 it is possible to climb up the North Tower, the Main Gate Tower and enjoy the medieval aura.



#### **GUTMAN'S CAVE**

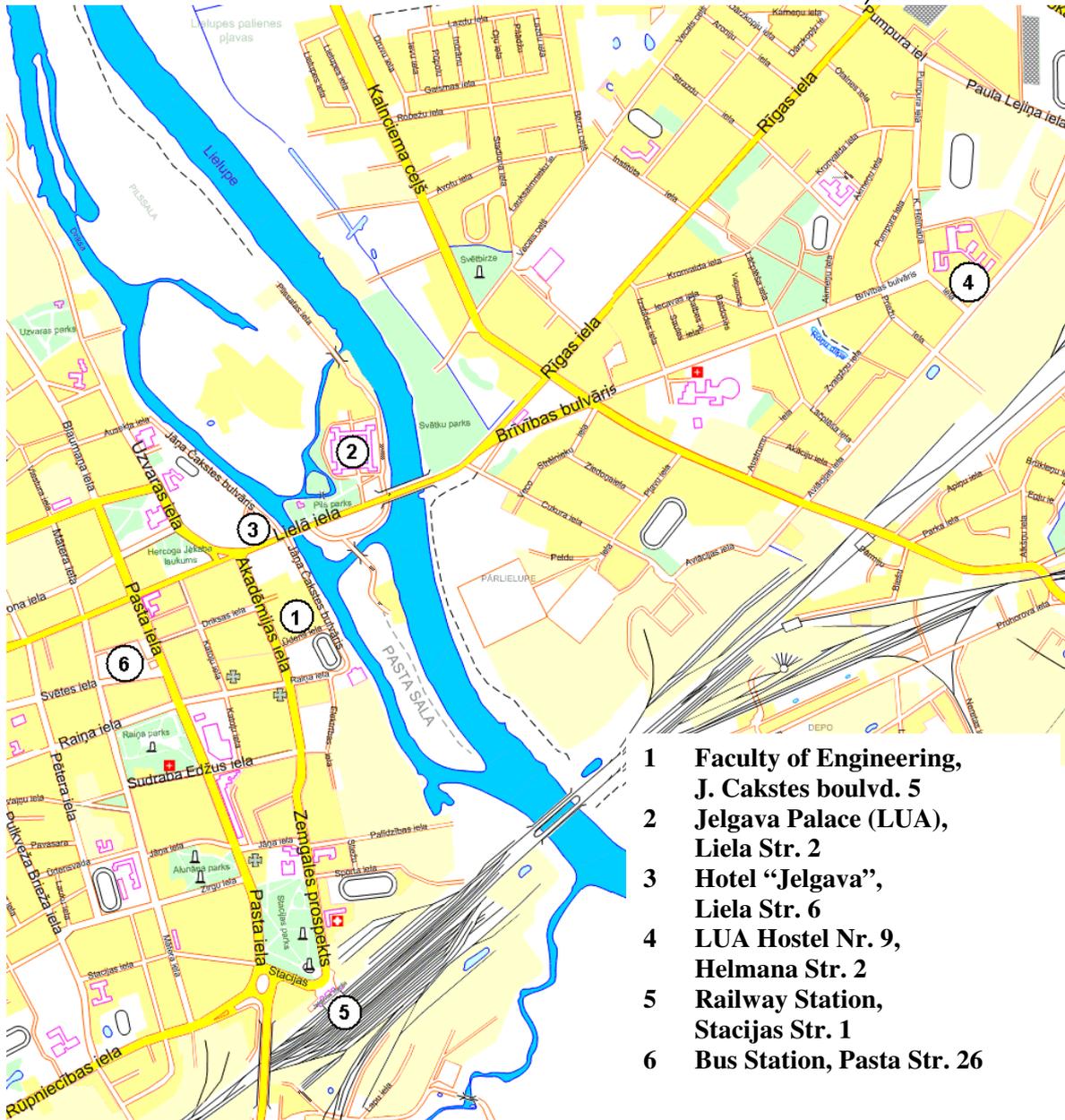
The largest cave in the Baltic countries and also the oldest tourist attraction in Latvia. On the walls of the cave there are inscriptions from the 17th century. The legend of the Rose of Turaida began in this cave.



#### **TURAJDA MUSEUM RESERVE**

The most visited museum in Latvia, where you can get acquainted with expositions concerning archaeology, culture and art history, which tell the story of events that have occurred during the last 1000 years. Medieval castle and church, Gauja Livs, the old manor centre and Dainu Hill are the main sights to be visited.





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

*Address of the Conference Committee*

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