

TTÜ KÜBERNEETIKA INSTITUUT
TEADUS- JA ARENDUSTEGEVUSE AASTAARUANNE 2014

1. Struktuur

Tallinna Tehnikaülikooli Küberneetika Instituut
Institute of Cybernetics at Tallinn University of Technology
Instituudi direktor Andrus Salupere

- Foneetika ja kõnetehnoloogia laboratoorium
Laboratory of Phonetics and Speech Technology
Juhataja: Einar Meister
- Fotoelastsuse laboratoorium
Laboratory of Photoelasticity
Juhataja: Johan Anton
- Juhtimissüsteemide laboratoorium
Laboratory of Control Systems
Juhataja: Ülle Kotta
- Lainetuse dünaamika laboratoorium
Laboratory of Wave Engineering
Juhataja: Tarmo Soomere
- Mittelineaarse dünaamika laboratoorium
Laboratory of Nonlinear Dynamics
Juhataja: Jaan Kalda
- Süsteemibioloogia laboratoorium
Laboratory of Systems Biology
Juhataja: Marko Vendelin
- Tarkvarateaduse laboratoorium
Laboratory of Software Science
Juhataja: Tarmo Uustalu
- Raamatukogu
Library
Juhataja: Marje Tamm

2. Teadus- ja arendustegevuse (edaspidi T&A) iseloomustus

2.1 Struktuuriüksusesse kuuluvad uurimisgrupid (*kõik uurimisgrupid näidatakse aruandes eraldi, järgides alltoodud ülesehitust*).

Uurimisgrupi nimetus (*eesti ja inglise keeles*) **ja juhi nimi**

- uurimisgrupi teadustöö kirjeldus (*inglise keeles*);
- uurimisgrupi aruandeaastal saadud tähtsamad teadustulemused (*inglise keeles*);
- uurimisgrupi kuni 5 olulisemat publikatsiooni aruandeaastal.

FONEETIKA JA KÕNETEHNOLOOGIA PHONETICS AND SPEECH TECHNOLOGY

Juht: Einar Meister

Laboratory of Phonetics and Speech Technology is focused on experimental studies of Estonian phonetics and research and development of methods and prototypes for Estonian speech recognition.

Main results in 2014

We developed a neural network based phone duration model for speech recognition. The model is trained to estimate a phone duration PDF based on its neighbouring phones and the already observed durations of the previous phones. Experimental results on Estonian, English and Finnish recognition tasks show that the method results in a consistent drop in word error rate. We also proposed an effective and simple multi-domain recurrent neural network language model which enables training a joint model over multiple domains. The model was found to outperform all other compared models in Estonian radiology speech recognition experiments. Many improvements were developed in our publicly available Estonian speech recognition systems. For example, the word error rate of Estonian broadcast conversational speech dropped from 20.3% to 16.9%.

Morphosyntactic clustering has been found potentially beneficial for building NLP systems for languages for which annotated training data lack. We proposed a generative probabilistic model that induces those morphosyntactic clusters combining two information sources: distributional information taking into account the context of words and morphological information using the words' suffixes. We demonstrated the utility of this model on English. On other, morphologically more complex languages, the results were not as good as expected, the reasons of which require further study.

The evaluation of the Estonian audiovisual text-to-speech synthesis using perception experiments with acoustic and audiovisual stimuli sets with different levels of background noise showed that visual articulatory gestures of the talking head enhance speech perception in noisy conditions.

The study on the production of Estonian quantity contrasts by foreign-language speakers with Latvian language background showed that Latvian subjects successfully produced the Estonian Q1/Q2 contrast, but failed to produce Q2/Q3 contrast.

SELECTED PUBLICATIONS

1. Alumäe, Tanel (2014). Neural network phone duration model for speech recognition. In: Interspeech 2014: 15th Annual Conference of the International Speech Communication Association, 14-18 September, Singapore, Proceedings: Singapore: International Speech Communication Association, 2014, 1204–1208.
2. Tilk, Ottokar; Alumäe, Tanel (2014). Multi-domain recurrent neural network language model for medical speech recognition. Human Language Technologies - the Baltic Perspective: Proceedings of the Sixth International Baltic Conference, Baltic HLT 2014. (Eds.) Utku, Andrius; Grigonytė, Gintarė; Kapočiūtė-Dzikiėnė, Jurgita; Vaičėnonienė, Jurgita. Amsterdam: IOS Press, 2014, (Frontiers in Artificial Intelligence and Applications; 268), 149–152.
3. Sirts, Kairit; Eisenstein, Jacob; Elsnėr, Micha; Goldwater, Sharon (2014). POS induction with distributional and morphological information using a distance-dependent Chinese restaurant process. In: The 52nd Annual Meeting of the Association for Computational Linguistics. Proceedings of the Conference. Volume 2: Short Papers: ACL 2014, June 22-27, Baltimore, USA, 22-27 June, 20: Stroudsburg, PA: Association for Computational Linguistics, 2014, 265–271.
4. Meister, Einar; Metsvahi, Rainer; Fagel, Sascha (2014). Evaluation of the Estonian audiovisual speech synthesis. In: Human Language Technologies - the Baltic Perspective: Proceedings of the Sixth International Baltic Conference, Baltic HLT 2014: (Eds.) Utku, Andrius; Grigonytė, Gintarė; Kapočiūtė-Dzikiėnė, Jurgita; Vaičėnonienė, Jurgita. Amsterdam: IOS Press, 2014, (Frontiers in Artificial Intelligence and Applications; 268), 11–18.

5. Meister, Einar; Meister, Lya (2014). Estonian quantity degrees produced by Latvian subjects. *Linguistica Lettica*, 22, 85–106.

MITTELINEAARSED JUHTIMISSÜSTEEMID NONLINEAR CONTROL SYSTEMS

Juht: Ülle Kotta

Nonlinear Control Theory group has competence in dynamical control systems on time scales. Attention is focused on novel algebraic methods and symbolic software tools for solving fundamental problems for nonlinear control systems towards unification of discrete- and continuous-time control.

Main results in 2014

We have studied how nonlinear realization theory can contribute to the linear parameter-varying (LPV) realization theory, having a clear orientation toward practical applications. Note that in the LPV case one is interested to get the state equations with static dependence on the scheduling variable (parameter) p . The necessary and sufficient solvability conditions are obtained, and three additional subclasses of LPV input-output equations are suggested that are guaranteed to have a realization of the considered type.

The input-output linearization problem by dynamic output feedback has been solved for multi-input multi-output nonlinear systems, described by the set of higher order difference equations. Necessary and sufficient solvability conditions are obtained together with the constructive procedure to check the conditions and compute the feedback.

Computation-oriented necessary and sufficient accessibility (controllability) conditions are derived for nonlinear system, described by the set of higher order input-output differential equations.

The conditions are derived for the existence of a state transformation, bringing the state equations, defined on (homogeneous) time scales, into the observer form, which is linear up to some nonlinear input and output –dependent functions. Design of the nonlinear state observer is relatively easy for such form.

SELECTED PUBLICATIONS

1. Belikov, J., Kotta, Ü., Tõnso, M. Adjoint polynomial formulas for nonlinear state-space realization. - *IEEE Transactions on Automatic Control*, 2014, 59, 1, 256-261
2. Belikov, J., Kotta, Ü., Tõnso, M. Comparison of LPV and nonlinear system theory: A realization problem. - *Systems & Control Letters*, 2014, 64, 72-78.
3. Ciulkin, M., Kaparin, V., Kotta, Ü., Pawluszewicz, E. Linearization by input-output injections on homogeneous time scales. - *Proceedings of the Estonian Academy of Sciences*, 2014, 63, 4, 387-397.
4. Kaldmäe, A., Kotta, Ü. Input-output linearization of discrete-time systems by dynamic output feedback. - *European Journal of Control*, 2014, 20, 2, 73-78.
5. Kotta, Ü., Tõnso, M., Kawano, Y. Polynomial accessibility condition for the multi-input multi-output nonlinear control system. - *Proceedings of the Estonian Academy of Sciences*, 2014, 63, 2, 136-150.

LAINETUSE DÜNAAMIKA WAVE ENGINEERING

Juht: Tarmo Soomere

Wave Engineering group has competence in nonlinear wave theory and modelling of fluids with the focus on applications in the marine and coastal environments. Attention is to wave excitation

and propagation over the sea surface; impact of waves in coastal regions; unified framework for wave-driven phenomena.

Main results in 2014

The Carrier–Greenspan transform for wave run-up on a plane beach was generalised for inclined channels of arbitrary cross-section.

It has been demonstrated that nonlinear effects are most strongly pronounced for the run-up of a solitary wave of depression.

A measure of finite-time compressibility of flow fields was developed that accounts for time correlations of realistic flows and is capable to quantify the ability of clustering of passive tracers on the sea surface.

The locations for spontaneous formation of surface patches have been established for the Gulf of Finland through the analysis of time correlations of the convergence field and the Lagrangian transport.

The wave energy resource theoretically and practically available in a semi-sheltered shelf sea of moderate depth and with highly intermittent wave climate has been quantified on the example of the Baltic Sea.

The options for using an ensemble of projections to evaluate return periods of extreme water levels are established for selected locations of the Estonian coast.

SELECTED PUBLICATIONS

1. Soomere T., Viška M. (2014). Simulated sediment transport along the eastern coast of the Baltic Sea. *Journal of Marine Systems*, 129, 96–105, doi: 10.1016/j.jmarsys.2013.02.001
2. Rybkin A., Pelinovsky E., Didenkulova I. (2014). Nonlinear wave run-up in bays of arbitrary cross-section: generalization of the Carrier–Greenspan approach. *Journal of Fluid Mechanics*, 748, 416–432, doi:10.1017/jfm.2014.197
3. Soomere T., Eelsalu M. (2014). On the wave energy potential along the eastern Baltic Sea coast. *Renewable Energy*, 71, 221–233, doi: 10.1016/j.renene.2014.05.025
4. Didenkulova I.I., Pelinovsky E.N., Didenkulov O.I. (2014). Run-up of long solitary waves of different polarities on a plane beach. *Izvestiya RAS. Physics of the Atmosphere and Ocean*, 50, 5, 532–538.
5. Giudici A., Soomere T. (2014). Finite-time compressibility as an agent of frequent spontaneous patch formation in the surface layer: a case study for the Gulf of Finland, the Baltic Sea. *Marine Pollution Bulletin*, 89, 1–2, 239–249, doi: 10.1016/j.marpolbul.2014.09.053

MITTELINEAARNE DÜNAAMIKA NONLINEAR DYNAMICS

Juht: Jaan Kalda

Nonlinear Dynamics group deals with (i) nonlinear wave motion in solids; (ii) soft matter physics; (iii) photoelasticity; (iv) applied mathematics. Attention is on hierarchical behaviour of microstructured solids under dynamical impact; solitons and solitary waves; turbulent mixing; processes with power laws; nonlinear photoelastic tomography; inverse problems to determine properties of complex materials; fast methods for solving integral equations.

Main results in 2014

For the first time in the theory of microstructured solids, the effects of microdeformation and microtemperature are described simultaneously within one mathematical model using double dual internal variables approach.

Based on Mindlin's model of microstructured solids, the concept of wave hierarchies in the Whitham's sense is generalized to hierarchies of second order wave operators and to nonlinear media.

A comparison of finite element method, isogeometric analysis, and finite volume method in numerical simulation of one-dimensional elastic wave propagation problems with stress discontinuities is performed.

Numerical simulation of crack propagation under conditions of 3-point bending test is performed in order to estimate the bridging effect of the reinforcement of Al₂O₃ by fibers covered by graphene layer.

The formation of solitons in a microstructured continuum and the sensitivity of this process to the initial conditions is modelled by a hierarchical Korteweg-de Vries equation.

Zabolotskaya-Khokhlov-type 2D evolution equation two-dimensional evolution equation is derived for the description of wave beams in microstructured solids using the Mindlin-type model.

The mathematical model is derived to describe the nonlinear interaction of tone bursts in functionally graded materials with strongly variable properties is studied; the obtained equations are solved numerically.

The scaling exponents describing the temporal behaviour of the size of the intersections of fractal sets which fluctuate in time are derived.

Finite-time Lyapunov exponents have been expressed for isotropic homogeneous chaotic two-dimensional flows with finite correlation time in terms of the velocity gradient tensor statistics.

Light propagation in inhomogeneous media with fluctuating coefficient of refraction has been interpreted as a chaotic mixing of the wavefront in the 6-dimensional phase space.

SELECTED PUBLICATIONS

1. Engelbrecht, J; Salupere, A (2014). Scaling and hierarchies of wave motion in solids. *Zeitschrift für Angewandte Mathematik und Mechanik*, 94(9), 775 - 783.
2. Salupere, A.; Lints, M.; Engelbrecht, J. (2014). On solitons in media modelled by the hierarchical KdV equation. *Archive of Applied Mechanics*, 84, 1583 - 1593.
3. Berezovski, A.; Engelbrecht, J.; Van, P. (2014). Weakly nonlocal thermoelasticity for microstructured solids: microdeformation and microtemperature. *Archive of Applied Mechanics*, 84(9-11), 1249 - 1261.
4. Ravasoo, A. (2014). Interaction of bursts in exponentially graded materials characterized by parametric plots. *Wave Motion*, 51(5), 758 - 767.
5. Kalda, J.; Soomere, T.; Giudici, A. (2014). On the finite-time compressibility of the surface currents in the Gulf of Finland, the Baltic Sea. *Journal of Marine Systems*, 129, 56 - 65.

SÜSTEEMIBIOLOGIA SYSTEMS BIOLOGY

Juht: Marko Vendelin

Systems Biology group is focused on unravelling the intricacies behind regulation of intracellular processes in cardiac muscle cells. Efforts are mostly concentrated on studying regulatory mechanisms of metabolic processes in the heart, expanding our knowledge of cardiac energetics and contractile function, and shedding light on novel aspects of excitation-contraction coupling in rat, trout and mouse hearts. Both experimental and computational approaches are applied in investigating these topics.

Main results in 2014

We have demonstrated that in oxidative muscle, such as a heart, some ATPases are tightly coupled to glycolysis and do not use ATP provided by mitochondria. Namely, we have shown that plasmalemma Na⁺/K⁺-ATPase (NKA) is exclusively fueled by ATP provided through tightly coupled glycolytic enzymes with undetectable flux of ATP between mitochondria and NKA. Such tight coupling of NKA to PK is in line with its increased importance in the pathological states of the heart when the substrate preference shifts to glucose.

On the basis of our data, we suggest that at least part of the diffusion restriction at the mitochondrial outer membrane level is not by the membrane itself, but due to the close physical association between the sarcoplasmic reticulum and mitochondria.

SELECTED PUBLICATIONS

1. Sepp, M., Sokolova, N., Jugai, S., Mandel, M., Peterson, P., & Vendelin, M. (2014). Tight Coupling of Na⁺/K⁺-ATPase with Glycolysis Demonstrated in Permeabilized Rat Cardiomyocytes. PLoS ONE, 9(6), e99413. doi:10.1371/journal.pone.0099413
2. Birkedal, R., Laasmaa, M., & Vendelin, M. (2014). The location of energetic compartments affects energetic communication in cardiomyocytes. Frontiers in Physiology, 5, 376. doi:10.3389/fphys.2014.00376

TARKVARATEADUS SOFTWARE SCIENCE

Juht: Tarmo Uustalu

The Laboratory of Software Science conducts research into language and automata theory, programming languages and software engineering.

Main results in 2014

Language and automata theory:

To clarify the connection of residual automata to atoms of regular languages, the maximized automaton of a language was defined and studied.

The transformation of context-free grammars to Chomsky normal form was certified in the Agda dependently typed programming language.

Programming languages:

A coherence theorem was proved for skew-monoidal categories and formalized in Agda.

Normalization by evaluation for typed lambda calculus was reconstructed using computation in the delay monad and formalized in Agda.

A novel structure for bidirectional transformations, update lenses, refining ordinary state-based lenses, was defined and studied in detail.

Different intensional aspects of stackful computation were shown to be analyzable using special monads more refined than the state monad.

An abstract categorical semantics was developed for functional reactive programming with resources.

Software engineering:

The linked data technology was shown to have the potential to serve as an integrator of technologies by providing tools for interlinking big data, internet of things data and social media data.

The Cocovila system was used for modelling and simulation of different types of hydraulic valves, scheduling of a floor manufacturing process, modelling of heating, ventilation and air conditioning systems.

SELECTED PUBLICATIONS

1. D. Ahman, J. Chapman, T. Uustalu. When is a container a comonad? Log. Methods in Comput. Sci., v. 10, n. 3, article 14, 2014. doi:10.2168/lmcs-10(3:14)2014
2. T. Altenkirch, J. Chapman, T. Uustalu. Relative monads formalised. J. of Formalized Reasoning, v. 7, n. 1, pp. 1-43, 2014.
3. J. Brzozowski, H. Tamm. Theory of $\mathcal{C}\square$ tomata. Theor. Comput. Sci., v. 539, pp. 13-27, 2014. doi: 10.1016/j.tcs.2014.04.016
4. D. Firsov, T. Uustalu. Certified CYK parsing of context-free languages. J. of Log. and Algebr. Methods in Program., v. 83, n. 5-6, pp. 459-468, 2014.
5. H.-M. Haav, A. Kalja, T. Robal, eds. Databases and Information Systems VIII, v. 270 of Frontiers in Artificial Intelligence, xi+359 pp. IOS Press, 2014.

2.2 Loetelu struktuuriüksuse töötajate rahvusvahelistest tunnustustest.

Hele-Mai Haav valiti ja promoveeriti Läti Ülikooli audoktoriks

Ahto Kalja valiti ja promoveeriti Läti Ülikooli audoktoriks

Ira Didenkulova sai L'Oreal-UNESCO auhinna "Naistele teaduses"

2.3 Loetelu struktuuriüksuse töötajatest, kes on välisakadeemiate või muude oluliste T&A-ga seotud välisorganisatsioonide liikmed.

Tanel Alumäe

International Speech Communication Association (ISCA) - liige

Jüri Engelbrecht

ICSU Peaassamblee liige

Euromech liige

ERAWATCH nõukoja liige

RP7 „Peoples Programme“ nõukoja liige

ERA-NET Complexity juhtkomitee liige

Academia Europea, liige

World Academy of Arts and Sciences liige

Bulgaaria Teaduste Akadeemia välisliige

Budapesti Tehnikaülikooli audoktor (Dr. h.c.)

Ungari Teaduste Akadeemia, auliige

Göteborgi Kuningliku Teadus- ja Kunstiühingu välisliige

Lissaboni Teaduste Akadeemia liige

Läti Teaduste Akadeemia, välisliige

Euroopa Teaduste ja Kunstide Akadeemia liige

Accademia Peloritana dei Pericolanti, välisliige

Hele-Mai Haav

Baltic Journal of Modern Computing- toimetuskolleegiumi liige

Proceedings of Riga Technical University - toimetuskolleegiumi liige

European Coordinating Committee for Artificial Intelligence (ECCAI) liige ja Eesti koordinaator

Jaan Janno

Abstract and Applied Analysis - toimetuskolleegiumi liige

Mathematical Modelling and Analysis – toimetuskolleegiumi liige

The Open Acoustics Journal - toimetuskolleegiumi liige

Baltimaade ülikoolide konverentsivõrgustiku MMA liige

Jaan Kalda

European Academy of Sciences and Arts – liige

Academic advisor of the Saudi Arabian Physics Olympiad team

International Jury of the World Physics Olympiad – liige

Ahto Kalja

Baltic Journal of Modern Computing- toimetuskolleegiumi liige

Einar Meister

International Speech Communication Association (ISCA) - liige

Lya Meister

International Speech Communication Association (ISCA) - liige

Jaan Penjam

EL 7. Raamkava IST programmi programmkomitee Eesti delegatsiooni ekspert

ACM – Association for Computing Machinery – liige

Ewald Quak

Journal of Mathematics in Industry, Springer, toimetuskolleegiumi liige

EL RP7 programmi „People“ Marie Curie Industry-Academia Partnerships and Pathways (IAPP) taotlusi hindava paneeli aseesimees

Andrus Salupere

IUTAM (International Union of Theoretical and Applied Mechanics) peassamblee liige

Euroopa Mehaanikaühingu Euromech liige

Tarmo Soomere

Euroopa Teadusfondi Merekomitee aseesimees

Journal of Marine Systems toimetuskolleegiumi liige

Boreal Environment Research toimetuskolleegiumi liige

Oceanologia toimetuskolleegiumi liige

Euroopa Geoteaduste Liidu liige

Euroopa Akadeemiate Nõuandva Kogu Keskkonnapaneeeli liige

Enn Tõugu

Academia Europea, liige

IEEE liige

IEEE Computer Society, liige

Computing and Informatics /Slovak Acad Sci) toimetuskolleegiumi liige

Knowledge Based Systems (Elsevier) toimetuskolleegiumi liige

Tarmo Uustalu

International Federation for Information Processing (IFIP), Working Group 2.1 „Algorithmic Languages and Calculi“ liige (al 2010)

Journal of Universal Computer Science toimetuskolleegiumi liige

Association for Computing Machinery (ACM), liige

European Association for Programming Languages and Systems (EAPLS) liige

European Association for Logic, Language and Information (FoLLI) liige

European Association for Computer Science Logic (EACSL) liige

European Association for Theoretical Computer Science (EATCS) liige

Interest Group in Pure and Applied Logic (IGPL) liige

Formal Methods Europe (FME) liige

2.4 Soovi korral esitatakse aruandeaastal saadud T&A-ga seotud tunnustused (va punktis 2.3 toodud tunnustused), ülevaade teaduskorralduslikust tegevusest, teadlasmobiilsusest ning hinnang oma teadustulemustele.

Autasusid

Tarmo Soomeret autasustas Vabariigi President Valgetähe III klassi teenetemärgiga

Ahto Kaljat autasustas Vabariigi President Valgetähe IV klassi teenetemärgiga

Bert Viikmäe sai Eesti Rahvuskultuuri Fondi Teaduste Akadeemia allfondi noore teadlase stipendiumi

Bert Viikmäe doktoritöö sai üliõpilaste teadustööde konkursil III preemia

Eesti TA akadeemikud

Jüri Engelbrecht (asepresident kuni 14. dets.)

Enn Tõugu

Hillar Aben

Tarmo Soomere (osakonnajuhataja kuni 14. dets, president alates 8. dets)

Tarmo Uustalu

Osalemine rahvusvaheliste konverentside juhtkomiteede töös

Hele-Mai Haav: rahvusvahelised konverentsid ADBIS ja Baltic DB&IS

Tarmo Uustalu: rahvusvahelised konverentsid ETAPS, ICFP, DTP, MSFP, WGP, TYPES

Osalemine rahvusvaheliste konverentside programmikomiteede töös

J. Belikov The 22nd Mediterranean Conference on Control & Automation 2014 (MED'14)

Ü. Kotta IFAC World Congress 2014 (Associate Technical Editor).

J. Vain The 11th International Conference on Integrated Formal Methods (iFM) 2014, Italy; and 26th Nordic Workshop on Programming Theory (NWPT '14), 2014, Sweden

Tanel Alumäe ja Einar Meister Human Language Technologies: The Baltic Perspective (Baltic HLT 2014)

James Chapman: rahvusvaheline konverents APLAS 2014

Tarmo Uustalu: rahvusvahelised konverentsid LATIN 2014, TFP 2014, NWPT 2014

Hele-Mai Haav: rahvusvahelised konverentsid SOFSEM 2014, ADBIS 2014, BIS 2014 ja ACM SAC SWA 2014

Keiko Nakata: rahvusvahelised konverentsid FLOPS 2014, ML 2014 ja Haskell 2014.

Enn Tõugu: rahvusvaheline konverents CYCON 2014.

Rahvusvaheliste rahvusvaheliste teadusürituste (konverentsid, töötod, koolid, jms) korraldamine

Andrus Salupere juhtimisel korraldas Eesti teaduse tippkeskus CENS Tallinnas IUTAM sümpoosioni „Complexity of Nonlinear Waves“.

Hele-Mai Haava, Ahto Kalja ja Tarmo Robali (TTÜ arvutitehnika instituut) juhtimisel korraldasid Eesti teaduse tippkeskus EXCS, TTÜ Küberneetika Instituut ja TTÜ arvutiteaduse instituut Tallinnas rahvusvahelise konverentsi „11th Int Baltic Conference on Databases and Information Systems, Baltic DB&IS 2014“. Selle programmitoimkonnas töötasid Irina Astrova ja Jaan Penjam.

James Chapman korraldas Tallinnas rahvusvahelise töötoa Agda Intensive Meeting XX.

Tarmo Uustalu korraldas Palmes rahvusvahelise talvekooli 19th Estonian Winter School in Computer Science, EWSCS 2014.

Arkadi Berezovski oli mini-sümpoosioni "Wave Modelling in Solids" kaasesimees konverentsi "11th European Conference on Non-Destructive Testing" raames 6.-10. oktoobril 2014 Prahas.

Töö teadusajakirjade toimetuskolleegiumides ja erinumbrite toimetamine

Hele-Mai Haav: Scient J of Riga Techn Univ: Applied Computer Systems ja Baltic J of Modern Computing,

Ahto Kalja: Baltic J of Modern Computing

Enn Tõugu: Computing and Informatics ja Knowledge-Based Engineering

Ü. Kotta: Proceedings of Estonian Academy of Sciences ja Acta Mechanica et Automatica (Poland).

J. Vain (guest editor for special issue) Journal of Logical and Algebraic Methods in Programming. Elsevier [Special issue for 25th Nordic Workshop on Programming Theory (NWPT'13), Estonia, 2013]

Arkadi Berezovski: "Continuum Mechanics and Thermodynamics" ning "Applied and Computational Mechanics".

Jüri Engelbrecht: Dialogue and Universalism, J. Theor. and Applied Mechanics (Warsaw), Applied Mechanics (Kiev), Applied and Computational Mechanics (Czech Republic), Science and Society, Proceedings of the Estonian Academy of Sciences; Trames, ajakiri „Akadeemia“.

T.Soomere: Journal of Marine Systems, Oceanologia, Boreal Environment Research ja Fundamental and Applied Hydrophysics, ajakirjade Proceedings of the Estonian Academy of Sciences ja Estonian Journal of Earth Sciences kaastoimetaja

I.Didekulova ajakirja Natural Hazards and Earth System Sciences kaastoimetaja

Varia

Jüri Engelbrecht juhib Eesti Teaduste Akadeemia välisvahetuse programmi nõukogu ja kureerib kirjastustegevust. Samuti on ta Eesti Teaduse Tippkeskuste Nõukogu esimees ja osaleb Akadeemia Süvauuringute Instituudi (SUI) Nõukogu töös ning SUI töörühmas tippkeskuste uue määruse väljatöötamiseks.

HTM liinis osales Jüri Engelbrecht järgmiste komisjonide töös: Teaduse rahvusvahelistumise töörühm, Teaduse rahvusvahelistumise programmi juhtkomitee; Teadus- ja innovatsioonipoliitika seire programmi juhtnõukogu; Riikliku programmi “Ühiskonna väärtusarendus 2015-2020” nõukogu.

Jüri Engelbrecht osaleb ERAWATCHi Nõukoja töös ja Rumeenia Kõrghariduse ja Teadustegevuse Struktureerimise Programmi Rahvusvahelise Nõukoja töös ning on WAASi (World Academy of Arts and Science) juhatuse liige ja esindas Eesti TA'd ALLEA Peaassamblee istungil Oslos.

J. Engelbrecht on Eesti Rahvusliku Mehaanikakomitee liige.

Jaan Kalda töötab viie-liikmelises Rahvusvahelise Füüsikaolümpiaadi (RFO) Süllabuse Komitees, mille ülesanne on koostada uus RFO Süllabus. Uue Süllabuse esimene osa võeti vastu 2014. a juunis RFO-I Astanas.

Andrus Salupere on Eesti Rahvusliku Mehaanika Komitee esimees