

Tarkvarateaduse instituut, 2017. a teadus- ja arendustegevuse aruanne

DEPARTMENT OF SOFTWARE SCIENCE

Director: Jaan Penjam, jaan.penjam@ttu.ee

Main Figures 2017 (as of Jan. 01, 2018)

- academic staff, total 100
 - Incl. 11 professors, 48 researchers
- doctoral students, total 46
- scientific publications in 2017, total 101 (ETIS 1.1, ETIS 1.2, 2.1, 3.1)
- defended doctoral dissertations in 2017, total 7

The department conducts research within 9 research units:

- Centre for Digital Forensics and Cyber Security
- Laboratory of Socio-Technical Systems
- Laboratory of Language Technology
- Laboratory of Proactive Technologies
- High-Assurance Software Laboratory
- Nonlinear Control Systems Group
- Model-Based Software Engineering Group
- Large-Scale Systems Group
- Data Science Group

The Department of Software Science (DSS) is a newly established department of the School of Information Technologies that was formed in 2017 on the basis of the research groups of the former Department of Computer Science, Department of Computer Control, Department of Informatics and the Institute of Cybernetics. The research fields of DSS include logic, data analysis, programming languages, high-assurance software, model based software engineering, large-scale systems, digital forensics and cyber security, socio-technical systems, proactive technologies, nonlinear control systems, and human language technology. The research groups of DSS participate in the Estonian Centre of Excellence in ICT Research EXCITE and in the Centre of Excellence in Estonian Studies CEES. DSS is also partner in H2020 projects TOOP, GAIA-CILM ja C3S BARON.

1. Uurimisgruppide TA ülevaated.

RESEARCH GROUPS

CENTRE FOR DIGITAL FORENSICS AND CYBER SECURITY

Head of the centre: associate professor Rain Ottis, rain.ottis@ttu.ee

TUT Centre for Digital Forensics and Cyber Security works towards raising Estonian cyber security competence and capacity through education, research and development and aims to provide the best technology-focused cyber security graduate programs in the Baltic and Nordic countries.

The main research directions of the Centre are:

- Critical Information Infrastructure Protection
- Serious Games in Cyber Security
- Cryptography based Data Integrity solutions

In 2017

The Centre continued to share their cyber security expertise with the public and private sector. Among other things, the Centre contributed to the Locked Shields and Crossed Swords international cyber security exercises organized by the NATO CCDCOE, provided design input for the NATO Cyber Range and organized the Cyber Olympics competition for young cyber security enthusiasts. The Centre is responsible for the international Cyber Security MSc program with approximately 200 students.

Selected publications 2017:

- Buldas, A., Laanoja, R., Truu, A. A server-assisted hash-based signature scheme. - In: Secure IT Systems : 22nd Nordic Conference, NordSec 2017, Tartu, Estonia, November 8-10, 2017, Proceedings / Eds. H. Lippmaa [et al.]. Cham : Springer, 2017, 3-17. (Lecture Notes in Computer Science ; 10674). http://doi.org/10.1007/978-3-319-70290-2_1
- Kont, M., Pihelgas, M., Maennel, K., Blumbergs, B., Lepik, T. Frankenstack: toward real-time red team feedback. - In: MILCOM 2017 - IEEE Military Communications Conference: October 23-25, 2017, Baltimore, MD, USA, [Proceedings]. Baltimore, MD : IEEE, 2017, 400-405. <http://doi.org/10.1109/MILCOM.2017.8170852>
- Priisalu, J., Ottis, R. Personal control of privacy and data: Estonian experience. - Health and Technology, 2017, 7, 4, 441-451. <http://doi.org/10.1007/s12553-017-0195-1>

LABORATORY OF SOCIO-TECHNICAL SYSTEMS

Head of the laboratory: professor Kuldar Taveter, kuldar.taveter@ttu.ee

The research group carries out interdisciplinary research work at the intersection of software engineering, agent technologies, information systems, social sciences, and psychology. In particular, we apply the methodology called agent-oriented modeling (AOM) to the modeling, simulation, and prototyping of complex sociotechnical systems, such as systems for e-governance, smart cities and smart communities, crisis management and resilience, information fusion, as well as to the simulation of real-world social phenomena

In 2017

The most significant research results were working out an agile software engineering methodology for supporting information systems' integration projects, enhancing the practices of agile software engineering by combining goal models of AOM with user stories, working out, in collaboration with Boeing Digital Aviation and Analytics Lab in Frankfurt, Germany, computer-based simulations of how well psychological profiles of airline employees performing different roles facilitate or hinder cooperation between them, and designing in collaboration with Tartu University a simulation environment for studying the dynamics of the Estonian language environment.

Selected publications 2017:

- Taveter, K., Meriste, M. How can agents help in designing complex systems? - Journal of Telecommunication, Electronic and Computer Engineering, 2017, 9, 2-9, 1-8. <http://journal.utem.edu.my/index.php/jtec/article/view/2669/1718>
- Taveter, K., Norta, A. Agile software engineering methodology for information systems' integration projects. - In: Future Data and Security Engineering : 4th International Conference, FDSE 2017, Ho Chi Minh City, Vietnam, November 29 - December 1, 2017, Proceedings / Eds. T. K. Dang [et al.]. Cham : Springer, 2017, 215-230. (Lecture Notes in Computer Science ; 10646). http://doi.org/10.1007/978-3-319-70004-5_15
- Tenso, T., Norta, A. H., Rootsi, H., Taveter, K., Vorontsova, I. Enhancing requirements engineering in agile methodologies by agent-oriented goal models: two empirical case studies. - In: 2017 IEEE 25th International Requirements Engineering Conference Workshops (REW) 4-8 September 2017, Lisbon, Portugal, Proceedings. Los Alamitos, Calif : IEEE Computer Society, 2017, 268-275. <http://doi.org/10.1109/REW.2017.24>

LABORATORY OF LANGUAGE TECHNOLOGY

Head of the laboratory: senior research scientist Tanel Alumäe, tanel.alumae@phon.ioc.ee

The research fields of the research group are:

- speech and language technology (speech and speaker recognition, natural language processing).
- speech analysis and experimental phonetics (Estonian prosody and sound system, foreign accent in speech, phonetic databases).

In 2017

We investigated noise-robustness issues of speech recognition and proposed a method to extract noisy non-speech segments from unsupervised in-domain data and use it for training data augmentation. In the field of speaker recognition, we introduced on a novel method to train speaker identification models in a weakly supervised manner, based on speakers annotated at the recording level, not at the speech segment level as is usually done. Experimental-phonetic studies on Estonian adolescent speech resulted in novel results on dynamics of vowel space area and formant frequencies depending on gender and age. It was found that gender differences appear at the age 11, major changes in vowel quality take place from the age 12 to the age 15, following by minor changes till the age 18 when the vowel formants achieve typical characteristics of adult male and female speakers.

Selected publications 2017:

- Kurimo, M., Enarvi, S., Tilk, O., Varjokallio, M., Mansikkaniemi, A., Alumäe, T. Modeling under-resourced languages for speech recognition. - Language Resources and Evaluation, 2017, 51, 4, 961-987. <http://doi.org/10.1007/s10579-016-9336-9>
- Alumäe, T., Paats, A., Fridolin, I., Meister, E. Implementation of a radiology speech recognition system for Estonian using open source software. - In: INTERSPEECH 2017 : Situated Interaction, August 20-24, 2017, Stockholm, Sweden, Proceedings / Ed. F. Lacerda. Stockholm : International Speech Communication Association, 2017, 2168-2172. <http://doi.org/10.21437/Interspeech.2017-928>
- Meister, E., Meister, L. Eesti laste kõne I. Põhitooni akustiline analüüs. - Keel ja Kirjandus, 2017, 60, 7, 518-533. <http://kjk.eki.ee/ee/issues/2017/7/945>

LABORATORY OF PROACTIVE TECHNOLOGIES

Head of the laboratory: professor Leo Mõtus, leo.motus@ttu.ee

The laboratory focuses on theoretical and practical study of networked systems built from stationary and/or mobile software-intensive (proactive) components. Typical components are pervasive computing systems. The research is partitioned into three threads: (1) modeling and verification of situation-aware interaction-centered computation; (2) methods and technologies for acquiring situational information; (3) methods for processing and interpretation of situational information for (proactive) decision making. The long-term goal of the laboratory is the ability to detect and partially control the emergent behaviour in pervasive computing systems. In 2017 prof Mare Teichmann joined our Lab, and invoked study of mental models and activity theory – which are important aspects of situation awareness.

Selected publications 2017:

- Ehala, J., Kaugerand, J., Pahtma, R., Astapov, S., Riid, A., Tomson, T., Preden, J.-S., Mõtus, L. Situation awareness via Internet of things and in-network data processing. International Journal of Distributed Sensor Networks, 2017, 13, 1, 1-21. <http://doi.org/10.1177/1550147716686578>
- Astapov, S., Berdnikova, J., Ehala, J., Kaugerand, J., Preden, J.-S. Gunshot acoustic event identification and shooter localization in a WSN of asynchronous multichannel acoustic ground sensors. Multidimensional Systems and Signal Processing, 2017, pp.1-33. <https://doi.org/10.1007/s11045-017-0479-7>

- Riid, A., Preden, J.-S. Design of fuzzy rule-based classifiers through granulation and consolidation. - Journal of Artificial Intelligence and Soft Computing Research, 2017, 7, 2, 137-147.
<http://doi.org/10.1515/jaiscr-2017-0010>
- Rahmani, A.M., Liljeberg, P., Preden, J.S. and Jantsch, A. eds. Fog Computing in the Internet of Things: Intelligence at the Edge. Springer, 2017, <https://doi.org/10.1007/978-3-319-57639-8>
- Köse, A., Tepljakov, A., Astapov, S. Real-time localization and visualization of a sound source for virtual reality applications. - In: 2017 25th International Conference on Software, Telecommunications and Computer Networks (SoftCOM) : Split, Croatia, September 21-23, 2017 / Eds. D. Begušić [et al.]. Split, Croatia : IEEE, 2017, [1-6].
<http://doi.org/10.23919/SOFTCOM.2017.8115577>
- Udal, A.; Jaanus, M.; Valušis, G.; Kašalynas, I.; Ikonic, Z.; Indjin, D. Progress in development of the resonant tunneling diodes as promising compact sources at the THz gap bottom. In: Pereira, M.F.; Shulika, O. (Ed.). THz for CBRN and Explosives Detection and Diagnosis (169–178). Dordrecht: Springer. (NATO Science for Peace and Security Series B: Physics and Biophysics).
https://doi.org/10.1007/978-94-024-1093-8_20

Members from ProLab are involved in following research networks:

- Leo Mõtus: IEEE SMC Society Technical Committee on Cognitive Situation Management
- Jaanus Kaugerand: NATO Science and Technology Organization (STO), Systems and Concepts Integration (SCI) panel
- Andres Udal: COST MP1403 Nanoscale Quantum Optics (leading nation Germany)
- Andres Udal: COST CA16101 Multi-modal Imaging of FOREnsic Science Evidence - tools for Forensic Science (leading nation United Kingdom)

Contracts in 2017:

- „Smart Environment Networking Technologies“ (SmENeTe), Lep 17070
- „Concept of situation awareness in comprehensive defence“ (KVÜÖA project), LEP16101
- „A Methodology for the Detection and Evaluation of Mechanical Defects on Smartphones“, LEP17110

Throughout 2017 negotiations for new contracts have been held:

- Measuring electromagnetic disturbances caused by wind turbines - Mati Somp
- System for creating situation awareness for country's comprehensive defence (RITA Project) – Leo Mõtus
- New COST actions on developing technology for infrared and optical networks - Andres Udal

HIGH-ASSURANCE SOFTWARE LABORATORY

Head of the laboratory: lead research scientist Tarmo Uustalu, tarmo.uustalu@ttu.ee

This group conducts research into theories, methods and tools for developing high-assurance software, specializing on both proofs (certified software) and testing.

In 2017

The most significant results were the following. Three types of partiality monads were given explicit characterizations in the special case when the underlying functor of the monad is a container functor; this led in particular to a new simplified characterization of dominances. Foata normalization was shown to extend to a generalization of Mazurkiewicz traces where the commutability of two adjacent letters in a string depends on their left context; generalized Mazurkiewicz traces were applied to modeling relaxed memory models. A new set of mutation operators was defined for model-based mutation testing of web services modelled with timed automata; the verification rules for extracting live mutants from those generated were developed.

Selected publications 2017:

- F. Siavashi, J. Iqbal, D. Truscan, J. Vain. Testing web services with model-based mutation. In E. Cabello, J. Cardoso, A Ludwig et al. (eds), *Revised Selected Papers from 11th International Joint Conference, ICSoft 2016 (Lisbon, July 2016)*, v. 743 of *Commun. In Comput. and Inf. Sci.* pp. 45-67. Springer, 2017. https://doi.org/10.1007/978-3-319-62569-0_3
- H. Tamm, B. van der Merwe. Lower bound methods for the size of nondeterministic finite automata revisited. In F. Drewes, C. Martin-Vide, B. Truthe, eds., *Proc. of 11th Int. Conf. on Language and Automata Theory and Applications, LATA 2017 (Umeå, March 2017)*, v. 10168 of *Lect. Notes in Comput. Sci.*, pp. 261-272. Springer, 2017. https://doi.org/10.1007/978-3-319-53733-7_19
- T. Uustalu, N. Veltri. Partiality and container monads. In B.-Y. E. Chang, ed., *Proc. of 15th Asian Symp. on Programming Languages and Systems, APLAS 2017 (Suzhou, Nov. 2017)*, v. 10695 of *Lect. Notes in Comput. Sci.*, pp. 406-425. Springer, 2017. https://doi.org/10.1007/978-3-319-71237-6_20

NONLINEAR CONTROL SYSTEMS

Head of the research group: lead research scientist Ülle Kotta, kotta@ioc.ee

The control systems research group is a leading Estonian research unit in automatic control, focusing on control theory and symbolic software, supporting fundamental/applied research and teaching. The research is focused on nonlinear control systems, including also hybrid and time-delay systems.

The goal is to carry on basic research in nonlinear control theory, which has a firm base in applied mathematics. The group's research activities are directed towards developing theoretical and symbolic computation tools for modelling, analysis and synthesis of nonlinear control systems.

The group has made significant contributions in developing algebraic methods both for continuous- and discrete-time nonlinear control systems as well as for hybrid and time-delay systems. A universal algebraic formalism has been developed that simplifies the study of very different problems for nonlinear control systems. In this formalism, sequences of subspaces (or submodules in the case of time-delay systems) of differential 1-forms, associated with the control system, are defined and provide a lot of information about the structural properties of the system. During recent years the research group has applied the algebraic methods for the study of a number of fundamental properties of a control system; like dynamic feedback linearizability, accessibility, system (input-output and transfer) equivalence, irreducibility, realizability of the input-output system in the classical state space form and possibility to transform system equations in an observer form. Many procedures have been implemented in the computer algebra system Mathematica.

In 2017

The most significant research results were related to hybrid systems and time-delay systems. First, a disturbance decoupling scheme was proposed for a class of hybrid systems, called switched systems. Compared to most results on this topic, our result works with more general switching rules, which widens its applicability. Second, conditions were found for the existence of state-space realization of a nonlinear time-delay system. Structural properties in general are not so much studied for nonlinear time-delay systems. Our result is one of the first, that considers realization problem for nonlinear time-delay systems.

Selected publications 2017:

- Mystkowski, A., Kaparin, V., Kotta, Ü., Pawluszewicz, E., Tönso, M. Feedback linearization of an active magnetic bearing system operated with a zero-bias flux. - *International Journal of Applied Mathematics and Computer Science*, 2017, 27, 3, 539-548.

<http://doi.org/10.1515/amcs-2017-0038>

• Kaldmäe, A., Kotta, Ü. Input-output decoupling of discrete-time nonlinear systems by dynamic measurement feedback. - European Journal of Control, 2017, 34, 31-38.

<http://doi.org/10.1016/j.ejcon.2016.12.004>

• Kotta, Ü., Tönso, M. Realisation of linear time-varying systems. - International Journal of Control, 2017, 90, 9, 1951-1956.

<http://doi.org/10.1080/00207179.2016.1230891>

• Mullari, T.; Kotta, Ü.; Bartosiewicz, Z.; Pawluszewicz, E.; Moog, C. H. (2017). Forward and backward shifts of vector fields: towards the dual algebraic framework. IEEE Transactions on Automatic Control, 62 (6), 3029–3033.

<http://doi.org/10.1109/TAC.2016.2608718>.

MODEL-BASED SOFTWARE ENGINEERING

Head of the research group: director of the department Jaan Penjam, jaan.penjam@ttu.ee

The research of the group is aiming at a tool development that enables modeling and simulation of complex systems and automated program composition. We do research and take advantage of the following fields: ontology-driven software development; model-based software engineering; structural program synthesis — a proof search based program synthesis paradigm; visual specification languages; etc

During a number of decades several software tools that facilitate program synthesis features have been developed by the group:

- PRIZ – for mainframes IBM 370, ES;
- ExpertPRIZ – a PRIZ version for PC with built-in expert system engine;
- c-Priz - a PRIZ version for PC implemented in C; first tool in the line that facilitated a graphical user interface;
- NUT – an X11 based tool for engineering modeling running on Sun Solaris and Linux (support discontinued);
- CoCoViLa – the current Java-based tool for model based visual program composition.

In 2017:

The most significant research results were related to the research on ontology technology developing and on model-based software deployment in hydraulic system design.

A precise implementations for execution of mapping rules from OWL to the CoCoViLa modelling language and for semi-automated generation of a DSL meta-model is realized.

Novelty of our approach comparing to other ontology-driven software development methodologies lies in using formal domain ontologies as a basis for automated generation of concept specification templates of a DSL meta-model that are consistent with the given domain ontology.

A tool for automatic evaluation of UI conformance to category-specific ontology-driven usability guidelines after modification of UI is developed.. This approach has been approved by the Estonian eGovernment authority for automated usability evaluation of web applications.

An approach based on multi-pole modelling and intelligent simulation is proposed and tested for design of fluid power feeding systems with pneumo-hydraulic accumulators.

Selected publications 2017:

• Haav, H.-M., Ojamaa, A. Semi-automated integration of domain ontologies to DSL meta-models. - International Journal of Intelligent Information and Database Systems, 2017, 10, 1/2, 94-116.

<http://doi.org/10.1504/IJIDS.2017.10007349>

• Marenkov, J., Robal, T., Kalja, A. A tool for design-time usability evaluation of web user interfaces. - In: Advances in Databases and Information Systems : 21st European Conference, ADBIS 2017, Nicosia,

Cyprus, September 24-27, 2017, Proceedings / Eds. M. Kirikova [et al.]. Cham : Springer, 2017, 394-407. (Lecture Notes in Computer Science ; 10509). http://doi.org/10.1007/978-3-319-66917-5_26

- Harf, M., Grossschmidt, G. Multi-pole modelling and intelligent simulation of a fluid power feeding system with a pneumo-hydraulic accumulator. - In: The 16th International Conference on Modeling and Applied Simulation, MAS 2017 : September, 18-20, 2017, Barcelona, Spain, Proceedings [part of the International Multidisciplinary Modelling and Simulation MultiConference, I3M 2017] / Eds. A. G. Bruzzone [et al.]. Genova, Italy : DIME University of Genoa, 2017, 128-135.

LARGE-SCALE SYSTEMS (LSS)

Head of the research group: professor Dirk Draheim, dirk.draheim@ttu.ee

The LSS group conducts research in large- and ultra-large-scale IT systems. The group investigates the architecture, design, realization and management of IT system landscapes, high-volume data-intensive systems, high-volume workflow-intensive systems, massively resource-intensive systems, highly distributed systems. We are engaged into education with Gunnar Piho as head of the study programme 'Business Information Technologies' and Ingrid Pappel as head of the international study programme 'E-governance Technologies and Services'.

Selected publications 2017:

- Tepandi, Jaak; Lauk, Mihkel; Linros, Janar; Raspel, Priit; Piho, Gunnar; Pappel, Ingrid; Draheim, Dirk (2017). The data quality framework for the Estonian public sector and its evaluation: establishing a systematic process-oriented viewpoint on cross-organizational data quality. In: Hameurlain, A.; et al. (Ed.). Transactions on Large-Scale Data- and Knowledge-Centered Systems XXXV (1-26). Berlin: Springer. (Lecture Notes in Computer Science; 10680). http://doi.org/10.1007/978-3-662-56121-8_1.
- Norta, Alex (2017). Designing a smart-contract application layer for transacting decentralized autonomous organizations. In: Singh, M.; et al. (Ed.). Advances in Computing and Data Sciences : First International Conference, ICACDS 2016, Ghaziabad, India, November 11-12, 2016, Revised Selected Papers (595?604). Singapore: Springer. (Communications in Computer and Information Science; 721). http://doi.org/10.1007/978-981-10-5427-3_61.
- Draheim D. Draheim, Dirk (2017). Generalized Jeffrey Conditionalization: A Frequentist Semantics of Partial Conditionalization. Berlin: Springer. <http://doi.org/10.1007/978-3-319-69868-7>

DATA SCIENCE

Head of the research group: professor Rein Kuusik, rein.kuusik1@ttu.ee

The research fields of the research group are:

- computational linguistics;
- data mining and machine learning.

A language-independent system has been created for testing dictionaries of the Wordnet type (there are about 70 of them in the world). It was shown that all dictionaries of this type contain tens of thousands of errors that the new testing system effectively detects. Cooperation with the authors of the Estonian Wordnet, for example, reduced the number of polysemic errors in the Estonian Wordnet by 97%.

An existing algorithm of zero-factor-free determinacy analysis was developed in order to find out how to detect object's belonging to a class. It is based on finding closed sets and their generators at the same time. As a bases for describing underlying data three types of rules can be found: class detection rules, (positive) association rules, negative association rules. The usage methodology was developed.

In 2017 the most significant research results were: an effective copyrighted formal method was created and programmed: „How to find corruptive coalitions in any procurement systems" (Leo Vöhandu and Ahti Lohk). An application of text mining to detect synonyms automatically from web

dictionary was created in 2017 and presented in January 2018 at the Global Wordnet Conference in Singapore. (A. Lohk, M. Tombak, K. Vare) (paper in print).

A monotone systems theory based algorithm for finding equivalent classes was developed (Grete Lind, Rein Kuusik).

Three doctoral thesis were defended in 2017: 1) Andre Veski "[Agent-Based Computational Experiments in Two-Sided Matching Markets.](#)", supervised by prof.-em. Leo Võhandu and Kaire Põder, 2) Fatih Güllü "[Conformity Analysis of E-Learning Systems at Largest Universities in Estonia and Turkey on the Basis of EES Model](#)", supervised by prof. Rein Kuusik, Mart Laanpere and Kazbulat Shogenov, 3) Grete Lind "[From Determinacy Analysis to Zero Factor Free Determinacy Analysis and Universal Generator of Hypotheses: Development of Algorithms.](#)", supervised by prof. Rein Kuusik.

Selected publications 2017:

- Ross, Kristiina; Lohk, Ahti (2017). Words, Forms and Phrases in Estonian Folksongs and Hymns. Folklore. Electronic Journal of Folklore, 67, 49–64.10.7592/FEJF.
- Henno, J. Information and interaction. - In: Information Modelling and Knowledge Bases XXVIII / Eds. H. Jaakkola [et al.]. Amsterdam : IOS Press, 2017, 426-449. (Frontiers in Artificial Intelligence and Applications ; 292). <http://doi.org/10.3233/978-1-61499-720-7-426>
- Võhandu, L.; Tamme, T.; Rull, A. (2017). Some formal methods for language ecology. Teesid / Abstracts : 16.rakenduslingvistika kevadkonverents Keel kui Ökosüsteem, 20.-21.aprill 2017, Tallinn = EAAL 16th Annual Conference Language as an Ecosystem, April 20-21, 2017, Tallinn, Estonia. Eesti Rakenduslingvistika Ühing, 10.

2. Info järeldoktorite kohta (nii TTÜ-s kui TTÜ-st välja)

- Danel Ahman on al aprillist 2017 järeldoktorant INRIAs Pariisis
- Denis Firsov on al jaanuarist 2017 järeldoktorant Iowa Ülikoolis
- Arvo Kaldmäe oli juuni-detsember 2017 järeldoktorant Newcastle'i Ülikoolis Austraalias Austraalia stipendiumiprogrammi Endeavour stipendiumiga.
- Niccolò Veltri on al septembrist 2017 järeldoktorant Kopenhaageni IT Ülikoolis

3. Info instituudi töötajate olulisemate sise- ja välisriiklike T&A-ga seotud tunnustuste kohta.

- Enn Tõugu, 2017, riiklik teaduspreemia pikaajalise teadus- ja arendustöö eest
- Niccolò Veltri, 2017, 2. preemia riiklikult üliõpilaste teadustööde konkursilt loodus- ja tehnikateaduste valdkonnas doktoriõppe astmes
- Andre Veski, 2017, diplom riiklikult üliõpilaste teadustööde konkursilt ühiskonnateaduste ja kultuuri valdkonnas doktoriõppe astmes
- Innar Liiv nimetati Eesti Noorte Teaduste Akadeemia asutajaliikmeks

4. Info instituudi töötajate kohta, kes on välisriikide akadeemiate ja/või muude oluliste T&A-ga seotud välisorganisatsioonide liikmed.

- Enn Tõugu on Academia Europaea liige

5. Info osalemise kohta erinevates TA võrgustikes.

- Ülle Kotta on IFAC TC 2.3 liige
- Innar Liiv on Atomiumi Euroopa Instituudi (EISMD) teaduskomitee liige ning REIsearch'i järgmise põlvkonna interneti teaduskomitee liige
- Tarmo Uustalu on IFIP WG 2.1 liige
- Tarmo Uustalu on COSTi aktsiooni ARVI juhttoimkonna Eesti-poolne liige ning COSTi aktsiooni EUTYPES asejuht)