

Curriculum vitae

TARMO UUSTALU, TTÜ KÜBERNEETIKA INSTITUUT / TTÜ ARVUTITEADUSE INSTITUUT

Isikuandmed

- sündinud 19. jaan. 1969 Tallinnas; Eesti kodanik, abielus, 3 last

Haridustee

- doktorantuur arvutiteaduses (tarkvaratehnikas), Kungl. Tekn. Högskolan, Stockholm (KTH), sept. 1992–juuni 1998
- diplomi- / magistriõpingud automatiseeritud juhtimissüsteemides / süsteemitehnikas ja informaatikas, Tallinna Polüteh. Inst. / Tallinna Tehnikaülikool (TTÜ), sept. 1987–juuni 1992

Akadeemilised kraadid

- PhD arvutiteaduses (tarkvaratehnikas), KTH, mai 1998
Dissertatsiooni tiitel: *Natural Deduction for Intuitionistic Least and Greatest Fixedpoint Logics, with an Application to Program Construction.*
- PhLic arvutiteaduses (tarkvaratehnikas), KTH, mai 1995
- MSc süsteemitehnikas ja informaatikas, TTÜ, juuni 1992

Teenistuskäik

- juhtivteadur, TTÜ Kübern. Inst., juuni 2009–...
- professor, TTÜ arvutiteaduse inst., sept. 2004–...
- dotsent, TTÜ arvutiteaduse inst., sept. 2002–aug. 2004
- järeldoktorant-stipendiaat (bolsairo de pós-doutoramento), Dep. de Informática, Univ. do Minho, Braga, apr. 2000–apr. 2002
- vanemteadur, TTÜ Kübern. Inst. sept. 1999–mai 2009 (peatatud apr. 2000–apr. 2002)
- dotsendi kt. (vik. universitetslektor), Inst. för Teleinformatik, KTH, Stockholm, juuli 1998–aug. 1999
- doktorant, uurimisinsener (forskningsingeniör), Inst. för Teleinformatik, KTH, Stockholm, sept. 1992–juuni 1998
- vanemtehnik, insener, Eesti TA Kübern. Inst., sept. 1986–aug. 1992

Teaduslikud huvid ja teadustöö suunad

Struktuurne tõestusteooria ja tüübiteooria, algebraline ja kategoorne loogika, programmikeelte semantika, programmilooigikad, funktsionaalprogrammeerimine, programmide teisendamine ja konstrueerimine, modaalloogika arvutiteaduslikud rakendused.

Publikatsioonid

88 teaduspublikatsiooni

Artiklid ajakirjades ja raamatutes/konverentsikogumikes:

- T. Altenkirch, J. Chapman, T. Uustalu. Monads need not be endofunctors. In C.-H. L. Ong, ed., *Proc. of 13th Int. Conf. on Foundations of Software Science and Computation Structures, FoSSaCS 2010 (Paphos, March 2010), Lect. Notes in Comput. Sci.*, v. 6014, pp. 297–311. Springer, 2010.
- K. Nakata, T. Uustalu. A Hoare logic for the coinductive trace-based big-step semantics of While. In A. D. Gordon, ed., *Proc. of 19th Europ. Symp. on Programming, ESOP 2010 (Paphos, March 2010), Lect. Notes in Comput. Sci.*, v. 6012, pp. 488–506. Springer, 2010.
- K. Nakata, T. Uustalu. Trace-based coinductive operational semantics for While: big-step and small-step, relational and functional styles. In S. Berghofer, T. Nipkow, C. Urban, M. Wenzel, eds., *Proc. of 22nd Int. Conf. on Theorem Proving in Higher-Order Logics, TPHOLs 2009 (Munich, Aug. 2009), Lect. Notes in Comput. Sci.*, v. 5674, pp. 375–390. Springer, 2009.

- B. Fischer, A. Saabas, T. Uustalu. Program repair as sound optimization of broken programs. In *Proc. of 3rd IEEE/IFIP Int. Symp. on Theoretical Aspects of Software Engineering, TASE 2009 (Tianjin, July 2009)*, pp. 165–173. IEEE CS Press, 2009.
- L. Pinto, T. Uustalu. Proof search and counter-model construction for bi-intuitionistic propositional logic with labelled sequents. In M. Giese, A. Waaler, eds., *Proc. of 18th Int. Conf. on Automated Reasoning with Analytic Tableaux and Related Methods, TABLEUX 2009 (Oslo, July 2009)*, *Lect. Notes in Artif. Intell.*, v. 5607, pp. 295–309. Springer, 2009.
- M. J. Frade, A. Saabas, T. Uustalu. Bidirectional data-flow analyses, type-systematically. In *Proc. of 2009 ACM SIGPLAN Wksh. on Partial Evaluation and Semantics-Based Program Manipulation, PEPM 2009 (Savannah, GA, Jan. 2009)*, pp. 141–149. ACM Press, 2009.
- T. Uustalu, V. Vene. The recursion scheme from the cofree recursive comonad. In V. Capretta, C. McBride, eds., *Proc. of 2nd Wksh. on Mathematically Structured Functional Programming, MSFP 2008 (Reykjavík, July 2008)*, *Electron. Notes in Theor. Comput. Sci.*, Elsevier, to appear.
- V. Capretta, T. Uustalu, V. Vene. Corecursive algebras: a study of general corecursion. In M. Oliveira, J. Woodcock, eds., *Revised Selected Papers from 12th Brazilian Symp. on Formal Methods, SBMF 2009 (Gramado, RS, Aug. 2009)*, *Lect. Notes in Comput. Sci.*, v. 5902, pp. 84–100. Springer, 2009. // Conf. version in *Proc. of 12th Brazilian Symp. on Formal Methods, SBMF 2009 (Gramado, RS, Aug. 2009)*, pp. 84–100. Univ. Federal do Rio Grande do Sul, 2009.
- A. Saabas, T. Uustalu. Proof optimization for partial redundancy elimination. *J. of Log. and Algebr. Program.*, v. 78, n. 7, pp. 620–643, 2009. // Conf. version in *Proc. of 2008 ACM SIGPLAN Wksh. on Partial Evaluation and Semantics-Based Program Manipulation, PEPM 2008 (San Francisco, CA, Jan. 2008)*, pp. 91–101. ACM Press, 2008.
- T. Uustalu, V. Vene. Comonadic notions of computation. In J. Adámek, C. Kupke, eds., *Proc. of 9th Int. Wksh. on Coalgebraic Methods in Computer Science, CMCS 2008 (Budapest, Apr. 2008)*, *Electron. Notes in Theor. Comput. Sci.*, v. 203, n. 5, pp. 263–284. Elsevier, 2008.
- B. Jacobs, T. Uustalu. Semantics of grammars and attributes via initiality. In E. Barendsen, V. Capretta, H. Geuvers, M. Niqui, eds., *Reflections on Type theory, Lambda-Calculus, and the Mind: Essays Dedicated to Henk Barendregt on the Occasion of His 60th Birthday*, pp. 181–196. Radboud Univ. Nijmegen, 2007.
- M. J. Frade, A. Saabas, T. Uustalu. Foundational certification of data-flow analyses. In *Proc. of 1st Joint IEEE/IFIP Int. Symp. on Theoretical Aspects of Software Engineering, TASE '07 (Shanghai, June 2007)*, pp. 107–116. IEEE CS Press, 2007.
- I. Hasuo, B. Jacobs, T. Uustalu. Categorical views on computations on trees. In L. Arge, C. Cachin, T. Jurdziński, A. Tarlecki, eds., *Proc. of 34th Int. Coll. on Automata, Languages and Programming, ICALP '07 (Wrocław, July 2007)*, *Lect. Notes in Comput. Sci.*, v. 4596, pp. 619–630. Springer, 2007.
- A. Saabas, T. Uustalu. Type systems for optimizing stack-based code. In M. Huisman, F. Spoto, eds., *Proc. of 2nd Wksh. on Bytecode Semantics, Verification, Analysis and Transformation, BYTECODE '07 (Braga, March 2007)*, *Electron. Notes in Theor. Comput. Sci.*, v. 190, n. 1, pp. 103–119. Elsevier, 2007.
- A. Saabas, T. Uustalu. Program and proof optimizations with type systems. *J. of Logic and Algebraic Program.*, v. 77, n. 1–2, pp. 131–154, 2008.
- N. Ghani, M. Hamana, T. Uustalu, V. Vene. Representing cyclic structures as nested datatypes. In A. Takana, ed., *Proc. of 23rd Conf. of Japan Society for Software Science and Technology, JSSST '06 (Tokyo, Sept. 2006)*, 8 pp., Univ. of Tokyo, 2006. // Also in H. Nilsson, ed., *Proc. of 7th Symp. on Trends in Functional Programming, TFP '06 (Nottingham, Apr. 2006)*, pp. 173–188. Univ. of Nottingham, 2006.
- A. Saabas, T. Uustalu. Compositional type systems for stack-based low-level languages. Manuscript. // Conf. version in B. Jay, J. Gudmundsson, eds., *Proc. of 12th Computing, Australasian Theory Symp., CATS 2006 (Hobart, Jan. 2006)*, *Confs. in Research and Practice in Inform. Techn.*, v. 51, pp. 27–39. Australian Comput. Soc., 2006.
- T. Uustalu, V. Vene. Comonadic functional attribute evaluation. In M. van Eekelen, ed., *Trends in Functional Programming 6*, pp. 145–162, Intellect, 2007. // Conf. version in M. van Eekelen, ed., *Proc. of 6th Symp. on Trends in Functional Programming, TFP '05 (Tallinn, Sept. 2005)*, pp. 33–43. Inst. of Cybern., 2005.
- P. Laud, T. Uustalu, V. Vene. Type systems equivalent to dataflow analyses for imperative languages. *Theor. Comput. Sci.*, v. 364, n. 3, pp. 292–310, 2006. // Conf. version in M. Hofmann, H.-W. Loidl, eds., *Proc. of 3rd APPSEM II Wksh., APPSEM '05 (Frauenchiemsee, Sept. 2005)*, 12 pp. Ludwig-Maximilians-Univ. München, 2005.
- A. Saabas, T. Uustalu. A compositional natural semantics and Hoare logic for low-level languages. *Theor. Comput. Sci.*, v. 373, n. 3, pp. 273–302, 2007. // Conf. version in P. D. Mosses, I. Ulidowski, eds., *Proc. of 2nd Wksh. on Structured Operational Semantics, SOS '05 (Lisbon, July 2005)*, *Electron. Notes in Theor. Comput. Sci.*, v. 156, n. 1, pp. 151–168. Elsevier, 2006.
- T. Uustalu, V. Vene. The essence of dataflow programming. In Z. Horváth, ed., *Revised Selected Lectures from 1st Central-European Functional Programming School, CEFP 2005 (Budapest, July 2005)*, *Lect. Notes in Comput. Sci.*, v. 4164, pp. 135–167. Springer, 2006. // Short conf. version in K. Yi, ed., *Proc. of 3rd Asian Symp. on Programming Languages and Systems, APLAS 2005 (Tsukuba, Nov. 2005)*, *Lect. Notes in Comput. Sci.*, v. 3780, pp. 2–18. Springer, 2005.

- T. Uustalu, V. Vene. Signals and comonads. *J. of Univ. Comput. Sci.*, v. 11, n. 7, pp. 1310–1326, 2005. // Conf. version in M. A. Musicante, R. M. F. Lima, eds., *Proc. of 9th Brazilian Symp. on Programming Languages, SBLP '05 (Recife, PE, May 2005)*, pp. 215–228. Univ. de Pernambuco, Recife, 2005.
- N. Ghani, P. Johann, T. Uustalu, V. Vene. Monadic augment and generalised short cut fusion. In *Proc. of 10th ACM SIGPLAN Int. Conf. on Functional Programming, ICFP '05 (Tallinn, Sept. 2005)* (= *ACM SIGPLAN Notices*, v. 40, n. 9), pp. 294–305. ACM Press, 2005.
- N. Ghani, T. Uustalu, V. Vene. Generalizing the augment combinator. In H.-W. Loidl, ed., *Trends in Functional Programming 5*, pp. 65–78. Intellect, 2006. // Conf. version in H.-W. Loidl, ed., *Proc. of 5th Symp. on Trends in Functional Programming, TFP '04 (München, Nov. 2004)*, pp. 65–76. Ludwig-Maximilians-Univ. München, 2004.
- N. Ghani, T. Uustalu, V. Vene. Build, augment and destroy, universally. In W.-N. Chin, *Proc. of 2nd Asian Symp. on Programming Languages and Systems, APLAS'04 (Taipei, Nov. 2004)*, *Lect. Notes in Comput. Sci.*, v. 3302, pp. 327–347. Springer, 2004.
- V. Capretta, T. Uustalu, V. Vene. Recursive coalgebras from comonads. *Inform. and Comput.*, v. 204, n. 4, pp. 437–468, 2006. // Conf. version in J. Adámek, ed., *Proc. of 7th Int. Wksh. on Coalgebraic Methods in Computer Science, CMCS '04 (Barcelona, March 2004)*, *Electron. Notes in Theor. Comput. Sci.*, v. 106, pp. 43–61. Elsevier, 2004.
- T. Altenkirch, T. Uustalu. Normalization by evaluation for $\lambda^{\rightarrow,2}$. In Y. Kameyama, P. J. Stuckey, eds., *Proc. of 7th Int. Symp. on Functional and Logic Programming, FLOPS 2004 (Nara, Apr. 2004)*, *Lect. Notes in Comput. Sci.*, v. 2998, pp. 260–275. Springer, 2004.
- N. Ghani, T. Uustalu, M. Hamana. Explicit substitutions and higher-order syntax. *Higher-Order and Symb. Comput.*, v. 19, n. 2–3, pp. 263–282, 2006. // Conf. version in F. Honsell, M. Miculan, A. Momigliano, eds., *Proc. of 2nd ACM SIGPLAN Wksh. on Mechanized Reasoning about Languages with Variable Binding, MERLIN'03 (Uppsala, Aug. 2003)*, 7 pp. ACM Press, 2003.
- T. Uustalu. Type-based termination of recursive definitions (abstract). *Bull. of Symb. Logic*, v. 10, n. 2, p. 244, 2004.
- N. Ghani, T. Uustalu. Coproducts of ideal monads. *Theor. Inform. and Appl.*, v. 38, n. 4, pp. 321–342, 2004. // Extended abstract in Z. Ésik, I. Walukiewicz, ed., *Proc. of 5th Int. Wksh. on Fixed Points in Computer Science, FICS '03 (Warsaw, Apr. 2003)*, pp. 32–36. Warsaw Univ., 2003.
- T. Uustalu, V. Vene. An alternative characterization of complete iterativeness (extended abstract). In Z. Ésik, I. Walukiewicz, ed., *Proc. of 5th Int. Wksh. on Fixed Points in Computer Science, FICS'03 (Warsaw, Apr. 2003)*, pp. 81–83. Warsaw Univ., 2003.
- T. Uustalu. Monad translating inductive and coinductive types. In H. Geuvers, F. Wiedijk, eds., *Selected Papers from 2nd Int. Wksh. on Types for Proofs and Programs, TYPES 2002 (Berg en Dal, Apr. 2002)*, *Lect. Notes in Comput. Sci.*, v. 2646, pp. 299–315. Springer, 2003.
- R. Matthes, T. Uustalu. Substitution in non-wellfounded syntax with variable binding. *Theor. Comput. Sci.*, v. 327, n. 1–2, pp. 155–174, 2004 // Conf. version in H. P. Gumm, ed., *Proc. of 6th Int. Wksh. on Coalgebraic Methods in Computer Science, CMCS '03 (Warsaw, Apr. 2003)*, *Electron. Notes in Theor. Comput. Sci.*, v. 82, n. 1. Elsevier, 2003.
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- T. Uustalu. Generalizing substitution. *Theor. Inform. and Appl.*, v. 37, n. 4, pp. 315–336, 2003. // Extended abstract in Z. Ésik and A. Ingólfssdóttir, eds., *Proc. of 4th Wksh. on Fixed Points in Computer Science, FICS '02 (Copenhagen, July 2002)*, pp. 9–11. Univ. of Aarhus, 2002.
- T. Uustalu, V. Vene. The dual of substitution is redecoration. In K. Hammond, S. Curtis, eds., *Trends in Functional Programming 3*, pp. 99–110. Intellect, 2002. // Conf. version in *Proc. of 3rd Scottish Funct. Prog. Workshop, SFP '01 (Stirling, Aug. 2001)*, pp. 201–211. Univ. of Stirling, 2001.
- G. Barthe, T. Uustalu. CPS translating inductive and coinductive types. In *Proc. of 2002 ACM SIGPLAN Wksh. on Partial Evaluation and Semantics-Based Program Manipulation, PEPM '02 (Portland, OR, Jan. 2002)* (= *ACM SIGPLAN Notices*, v. 37, n. 3), pp. 131–142. ACM Press, 2002.
- T. Uustalu. (Co)monads from inductive and coinductive types. In *Proc. of 2001 APPIA-GULP-PRODE Joint Conf. on Declarative Programming, AGP '01 (Évora, Sept. 2001)*, pp. 47–61. Univ. de Évora, 2001.
- G. Barthe, M. J. Frade, E. Giménez, L. Pinto, T. Uustalu. Type-based termination of recursive definitions. *Math. Struct. in Comput. Sci.*, v. 14, n. 1, pp. 97–141, 2004.
- T. Uustalu, V. Vene, A. Pardo. Recursion schemes from comonads. *Nordic J. of Computing*, v. 8, n. 3, pp. 366–390, 2001.
- T. Uustalu, V. Vene. Least and greatest fixed-points in intuitionistic natural deduction. *Theor. Comput. Sci.*, v. 272, n. 1–2, pp. 315–339, 2002.
- T. Uustalu, V. Vene. Coding recursion à la Mendler. In J. Jeuring, ed., *Proc. of 2nd Int. Wksh. on Generic Programming, WGP '00 (Ponte de Lima, July 2000)*, pp. 69–85. Utrecht Univ., 2000.

- T. Uustalu, V. Vene. Mendler-style inductive types, categorically. *Nordic J. of Computing*, v. 6, n. 3, pp. 343–361, 1999.
- T. Uustalu, V. Vene. Primitive (co)recursion and course-of-value (co)iteration, categorically. *Informatica*, v. 10, n. 1, pp. 5–26, 1999.
- V. Vene, T. Uustalu. Functional programming with apomorphisms (corecursion). *Proc. of Estonian Acad. Sci.: Phys., Math.*, v. 47, n. 3, pp. 147–161, 1998.
- V. Vene, T. Uustalu, E. Tyugu. Logical semantics of NUT extended with production rules. In J. Paakki, ed., *Proc. of 5th Symp. on Programming Languages and Software Tools, SPLST '97 (Jyväskylä, June 1997)*, pp. 145–154. Univ. of Helsinki, 1997.
- T. Uustalu, V. Vene. A cube of proof systems for the intuitionistic predicate μ, ν -logic. In M. Haveranen, O. Owe, eds., *Selected Papers from 8th Nordic Wksh. on Programming Theory, NWPT '96 (Oslo, Dec. 1996)*, pp. 237–246. Dept. of Informatics, Univ. of Oslo, 1997.
- T. Uustalu. A term calculus for intuitionistic μ -logic (abstract). *J. of IGPL*, v. 4, n. 2, pp. 341–342, 1996.
- T. Uustalu. Extensions of structural synthesis of programs. In U. H. Engberg et al., eds., *Proc. of 6th Nordic Wksh. on Programming Theory, NWPT '94 (Aarhus, Oct. 1994)*, pp. 416–428. Aarhus Univ., 1994.
- B. Mayoh, E. Tyugu, T. Uustalu. Constraint satisfaction and constraint programming: A brief lead-in. In B. Mayoh, E. Tyugu, J. Penjam, eds., *Proc. of NATO ASI on Constraint Programming (Pärnu, Aug. 1993)*, NATO ASI Series F, v. 131, pp. 1–16. Springer, 1994.
- E. Tyugu, T. Uustalu. Higher-order functional constraint networks. In B. Mayoh, E. Tyugu, J. Penjam, eds., *Proc. of NATO ASI on Constraint Programming (Pärnu, Aug. 1993)*, NATO ASI Series F, v. 131, pp. 116–139. Springer, 1994.
- T. Uustalu. Combining object-oriented and logic paradigms: A modal logic programming approach. In O. Lehrmann Madsen, ed., *Proc. of 6th Europ. Conf. on Object-Oriented Programming, ECOOP'92 (Utrecht, June/July 1992)*, *Lect. Notes in Comput. Sci.*, v. 615, pp. 98–113. Springer, 1992.
- T. Uustalu. Logics of time for programming use. In M. Oit, ed., *Preprints of Conf. on Tools and Environments for Developing Control Systems (Kääriku, May 1992)*, v. 1, pp. 190–204, 1992.
- T. Uustalu, P. Lorents. On some classes of hereditarily r.e. sets. *Proc. of Estonian Acad. Sci.: Phys., Math.*, v. 39, n. 2, pp. 108–111, 1990. (In Russian.)
- T. Uustalu, M. Pentus. Sequent systems of modal calculi. Preprint, 55 pp. Inst. of Cybernetics, Acad. Sci. of Estonian SSR, Tallinn, 1989. (In Russian.)

Toimetatud ajakirjanumbrid ja raamatud:

- R. Matthes, T. Uustalu, eds. *Theor. Inform. and Appl.*, special issue for 6th Wksh. on Fixed Points in Computer Science, FICS 2009 (Coimbra, Sept. 2009), in preparation.
- T. Altenkirch, T. Uustalu, guest eds. *Fund. Inform.*, Special Issue on Dependently Typed Programming, to appear.
- T. Uustalu, J. Vain, guest eds. *J. of Log. and Algebr. Program.*, Selected Papers from 20th Nordic Wksh. on Programming Theory, NWPT 2008 (Tallinn, Nov. 2008), to appear.
- R. Matthes, T. Uustalu. *Proc. of 6th Wksh. on Fixed Points in Computer Science, FICS 2009 (Coimbra, Sept. 2009)*, 124 pp. Inst. of Cybernetics, 2009.
- C. McBride, T. Uustalu, guest eds. *J. of Funct. Program.*, v. 19, n. 3–4 (Selected Papers from Wksh. on Mathematically Structured Functional Programming, MSFP 2006, Kuressaare, July 2006), pp. 263–488, 2009.
- T. Uustalu, guest ed. *Sci. of Comput. Program.*, v. 74, n. 8 (Selected Papers from 8th Int. Conf. on Mathematics of Program Construction, MPC 2006, Kuressaare, July 2006), pp. 497–668, 2009.
- C. McBride, T. Uustalu, eds. *Proc. of Wksh. on Mathematically Structured Functional Programming, MSFP 2006 (Kuressaare, July 2006)*, *Electron. Wkshs. in Comput.*. British Comput. Soc., 2006.
- T. Uustalu, ed. *Proc. of 8th Int. Conf. on Mathematics of Program Construction, MPC 2006 (Kuressaare, July 2006)*, *Lect. Notes in Comput. Sci.*, v. 4014, x+455 pp. Springer, 2006.
- V. Vene, T. Uustalu, eds. *Revised Lectures from 5th Int. School on Advanced Functional Programming, AFP 2004 (Tartu, Aug. 2004)*, *Lect. Notes in Comput. Sci.*, v. 3622, x+357 pp. Springer, 2005.
- J. Vain, T. Uustalu, guest eds. *Proc. of Estonian Acad. of Sci., Phys., Math.*, v. 52, n. 4 (Selected Papers from 14th Nordic Wksh. on Programming Theory, NWPT'02, Tallinn, Nov. 2002), 2003.

Kraaditööd:

- T. Uustalu. Natural deduction for intuitionistic least and greatest fixedpoint logics, with an application to program construction (PhD thesis). Royal Inst. of Techn., Stockholm, 1998.
- T. Uustalu. Aspects of structural synthesis of programs (Lic. thesis). Royal Inst. of Techn., Stockholm, 1995.
- T. Uustalu. Combination of object-oriented and logic paradigms (MSc thesis). Tallinn Techn. Univ. / Norwegian Inst. of Techn., Trondheim, 1991.

Õpetamiskogemus

Kraadielõppe kursused:

- põhiõppejõud, Diskreetne matemaatika, TTÜ rahvusvaheline õpe, kevad 2005
- põhiõppejõud, Rakendusloogika süvakursus, TTÜ, kevad 2004
- põhiõppejõud, Loogika arvutiteaduses, TTÜ, sügis 2002, sügis 2004, sügis 2005, sügis 2006, sügis 2007, sügis 2008, sügis 2009, sügis 2010
- assistent / põhiõppejõud, Loogiline programmeerimine, KTH, sügis 1995, sügis 1996, sügis 1997, sügis 1998
- assistent, Teadmiste esitamise ja töötlemise moodul, Teadmispõhine tarkvaratehnika, KTH, sügis 1993, sügis 1994, kevad 1995, kevad 1996, TTÜ, sügis 1994

Kraadiõppe kursused:

- põhiõppejõud, Funktsionaalprogrammeerimine, TTÜ, kevad 2004
- põhiõppejõud, Programmeerimiskeelte semantika, TTÜ, kevad 2003, kevad 2006, kevad 2010
- põhiõppejõud, Arvutiteaduse teoriaseminar/Formaalmeetodite mitteformaalseminar, TTÜ Kübern. Inst. sügis 1999–kevad 2000, kevad 2002–
- põhiõppejõud, Agentloogikad, TTÜ, kevad 1999
- assistent, Modaalloogika ja arvutused, KTH, kevad 1998
- põhiõppejõud, Programmeerimise loogikas ning Valitud eriteemade moodulid, Loogika arvutiteaduses, KTH, talv 1995/96
- põhiõppejõud, Programmeerimine loogikas, TÜ, sügis 1995
- põhiõppejõud, Denotatsioonsemantika moodul, Programmikeelte semantika, KTH, kevad 1993
- põhiõppejõud, Kitsenduste lahendamine ning kitsendustega programmeerimine, KTH, kevad 1993
- assistent, Tehisintellekti algoritmid, KTH, sügis 1992, TTÜ, talv 1993/94

Juhendamine:

- Andri Saar, doktoriõpingud info- ja kommunikatsioonitehnoloogias, TTÜ, sügis 2009–...
- Andri Saar, magistriõpingud informaatikas, TTÜ, kevad 2008–kevad 2009
- Andres Toom, doktoriõpingud info- ja kommunikatsioonitehnoloogias, TTÜ, sügis 2007–...
- Andres Toom, magistriõpingud arvuti- ja süsteemitehnikas, TTÜ, sügis 2006–kevad 2007
- Mait Peekma, bakalaureuseõpingud informaatikas, TTÜ, kevad–sügis 2005, magistriõpingud sügis 2006–...
- Ando Saabas, doktoriõpingud info- ja kommunikatsioonitehnoloogias, TTÜ, sügis 2004–sügis 2008
- Rustam Novikov, magistriõpingud informaatikas, TTÜ, sügis 2003–kevad 2005
- Peep Küngas, bakalaureuse- ja magistriõpingud arvuti- ja süsteemitehnikas, TTÜ, sügis 1998–kevad 2000, sügis 2000–kevad 2002

Teaduskorraldusliku töö kogemus

Teadusürituste korraldamine:

- programmitoimkonna esimees, 6th Wksh. on Fixed Points in Computer Science (FICS '09, Coimbra, sept. 2009), 20th Nordic Wksh. on Programming Theory (NWPT '08, Tallinn, nov. 2008), Wksh. on Mathematically Structured Functional Programming (MSFP '06, Kuressaare, juuli 2006), 8th Int. Conf. on Math. of Program Construction (MPC '06, Kuressaare, juuli 2006)
- programmitoimkonna liige, 3rd Wksh. on Mathematically Structured Functional Programming, MSFP '10 (Baltimore, MD, sept. 2010), 7th Wksh. on Fixed Points in Computer Science, FICS '10 (Brno, aug. 2010), Int. Conf. on Formal Verification of Object-Oriented Software, FoVeOOS '10 (Paris, juuni 2010), 10th Int. Conf. on Mathematics on Program Construction (MPC '10, Quebec City, juuni 2010), 10th Int. Wksh. on Coalgebraic Methods in Computer Science (CMCS '10, Paphos, märts 2010), 21st Nordic Workshop on Programming Theory (Lyngby, okt. 2009), 3rd Wksh. on Normalization by Evaluation (NBE '09, Los Angeles, CA, aug. 2009), 2009 ACM SIGPLAN Wksh. on Partial Evaluation and Semantics-Based Program Manipulation (PEPM '09, Savannah, GA, jaan. 2009), 9th Int. Conf. on Mathematics of Program Construction (MPC '08, Marseille, juuli 2008), 2nd Wksh. on Mathematically Structured Functional Programming (MSFP'08, Reykjavík, juuli 2008), 9th Int. Wksh. on Coalgebraic Methods in Computer Science (CMCS '08, Budapest, aprill 2008), 19th Nordic Wksh. on Programming Theory (NWPT '07, Oslo, okt. 2007), 9th Int. ACM SIGPLAN Symp. on Principles and Practice of Decl. Programming (PPDP '07, Wrocław, juuli 2007), 18th Nordic Wksh. on Programming Theory (NWPT '06, Reykjavík, okt. 2006), 8th Int. Wksh. on Coalgebraic Methods in Computer Science (CMCS '06, Viin, märts 2006), 17th Nordic Wksh. on Programming Theory (NWPT '05, Kopenhaagen, okt. 2005), 6th Symp. on Trends in Functional Programming (TFP '05, Tallinn, sept. 2005), 16th Nordic Wksh. on Programming Theory (NWPT '04, Uppsala, okt. 2004), 5th Int. Summer School and Wksh. on Advanced Functional Programming (AFP '04, Tartu, aug. 2004), 15th Nordic Wksh. on Programming Theory (NWPT '03, Turku, okt. 2003)
- korraldustoimkonna esimees, COST IC0701 Winter School (Viinistu, jaan. 2008), 20th Nordic Wksh. on Programming Theory (NWPT '08, Tallinn, nov. 2008), 8th Int. Conf. on Math. of Program Construction / 11th Int. Conf. on Algebraic Methodology and Software Technology (MPC/AMAST '06, Kuressaare, juuli 2006), IFIP WG 2.8 Meeting #22 (Kalvi, okt. 2005), 6th Symp. on Trends in Functional Programming / 10th ACM SIGPLAN Int. Conf. on Functional Programming / 4th Int. Conf. on Generative Programming and Component Engineering (TFP/ICFP/GPCE '05, Tallinn, sept./okt. 2005), FP5 IST Thematic Network APPSEM II 2nd Ann. Meeting (APPSEM '04, Tallinn, apr. 2004)
- korraldustoimkonna liige, Testcom-FATES/FORTE 2007 (Tallinn, juuni 2007), korraldustoimkonna liige, 14th Nordic Wksh. on Programming Theory (NWPT'02, Tallinn, nov. 2002)
- programmi- ja korraldustoimkonna esimees, XV Eesti Arvutiteaduse Talvekool (EWSCS '10, Palmse, veebr./märts 2010), XIV Eesti Arvutiteaduse Talvekool (EWSCS '09, Palmse, märts 2009), XIII Eesti Arvutiteaduse Talvekool (EWSCS '08, Palmse, märts 2008), XII Eesti Arvutiteaduse Talvekool (EWSCS '07, Palmse, märts 2007), XI Eesti Arvutiteaduse Talvekool (EWSCS '06, Palmse, märts 2006), X Eesti Arvutiteaduse Talvekool (EWSCS '05, Palmse, veebr./märts 2005), IX Eesti Arvutiteaduse Talvekool (EWSCS '04, Palmse, veebr./märts 2004)
- programmi- ja korraldustoimkonna liige, VIII Eesti Arvutiteaduse Talvekool (EWSCS '03, Palmse, märts 2003), VII Eesti Arvutiteaduse Talvekool (EWSCS '02, Palmse, märts 2002), VI Eesti Arvutiteaduse Talvekool (EWSCS '01, Palmse, märts 2001), V Eesti Arvutiteaduse Talvekool (EWSCS '00, Palmse, veebr./märts 2000), IV Eesti Arvutiteaduse Talvekool (EWSCS '99, Palmse, veebr./märts 1999)
- initsiaator ja põhikorraldajaid, Tallinna-Tartu vahelised arvutiteaduse teooriapäevad Andul (veebr. 2010), Mäetagusel (okt. 2009), Käärikul (jaan./veebr. 2009), Jõulumäel (okt. 2008), Põlvas (jaan. 2008), Vanaõuel (sept. 2007), Rõuges (jaan. 2007), Voorel (sept./okt. 2006), Kokel³ (veebr. 2006), Viinistul (okt. 2005), Kokel² (veebr. 2005), Veskisillal (okt. 2004), Kokel (jaan./veebr. 2004), Pedasel (okt. 2003), Arulas (veebr. 2003), Roostal (okt. 2002)
- seminaride korraldaja KübIs arvutiteadusest loogikas ettekandjatega välismaalt, kevad 2002–

Retsenseerimine/oponeerimine/ekspert:

- retsenseerinud artikleid rahvusvahelistele ajakirjadele Theor. Comput. Sci., Inform. and Comput., Math. Struct. in Comput. Sci., Theor. Inform. and Appl., J. of Funct. Program., Logic J. of IGPL, Fund. Inform., Nordic J. of Comput., Computer J. jt., rahvusvahelistele konverentsidele Int. Conf. on Mathematical Foundations of Computer Science (MFCS), Conf. on Automated Deduction (CADE), Int. Conf. on Algebraic and Coalgebraic Methods in Comput. Sci. (CALCO), Int. Conf. on Mathematical Foundations of Programming Semantics (MFPS), Int. Conf. on Algebraic Methods and Software Technology (AMAST), Int. Conf. on Mathematics of Program Construction (MPC), ACM SIGPLAN Int. Conf. on Funct. Program. (ICFP), Wksh. on Types for Proofs and Programs (TYPES), Wksh. on Coalgebraic Methods in Comput. Sci. (CMCS), Int. Conf. on Foundations of Software Science and Computation Structures (FoSSaCS), Int. Coll. on Automata, Languages and Programming (ICALP), IEEE Symp. on Logic in Computer Science (LICS), Europ. Conf. on Computer Science Logic (CSL), Int. Conf. on Typed Lambda Calculi and Applications (TLCA), Andrei Ershov Memorial Conf. on Perspectives of System Informatics (PSI), IEEE Conf. on Autom. Software Engineering (ASE), Scand. Conf. on Artif. Intell. (SCAI) jt.
- toimetuskolleegiumi liige, J. of Univ. Comput. Sci., nov. 2007–
- retsenseerinud projektitaotlusi Islandi Teadusfondile (Rannís), Hollandi Teadusorganisatsioonile (NWO), Eesti Teadusfondile
- oponeerinud doktoritööd ja litsentsiaaditööd Stockholmi Ülikoolis, 2003 ja 2005
- oponeerinud doktoritööd Tartu Ülikoolis, 2006
- oponeerinud doktoritööd Nottinghami Ülikoolis, 2009
- oponeerinud doktoritööd Oslo Ülikoolis, 2010
- doktoritöö kaitsmiskomisjoni esimees Chalmersi Tehnikaülikoolis, 2008
- doktoritöö kaitsmiskomisjoni esimees TTÜs, 2009
- dotsenditiitli hindamiskomisjoni liige Chalmersi Tehnikaülikoolis, 2008
- ETF tehnikateaduste ekspertide paneeli liige, 2002
- TKNi reaalteaduste ekspertgrupi liige, 2005–2006, 2006–

Juhtkogud

- TTÜ Kübi nõukogu liige, apr. 2004–apr. 2007, märts 2009–apr. 2010

Teadust populariseeriv tegevus

Artikleid, tõlkeid arvutiteaduse, loogika ja keelefilosoofia kohta “Akadeemias” jm. Kroonikat ja ülevaateid eesti arvutiteadusest mitmesugustes aastaraamatutes jms.

Osalus erialastes ühendustes

- liige, Assoc. for Computing Machinery (ACM), al. mai 2003, Formal Methods Europe (FME), al. sept. 2002, Europ. Assoc. for Programming Languages and Systems (EAPLS), al. sept. 1997, Europ. Assoc. for Logic, Language and Information (FoLLI), al. jaan. 1997, Interest Group in Pure and Applied Logics (IGPL), al. mai 1995, Europ. Assoc. for Computer Science Logic (EACSL), al. jaan. 1995, Europ. Assoc. for Theor. Comput. Sci. (EATCS), al. okt. 1994
- liige, Eesti Infotehnoloogia Selts (EITS), al. det. 1999, Eesti Süsteemiinseneride Selts (ESIS), al. märts 1993

Osalus suuremates projektides

- projekti juht, Majanduskeskkonna arenduskava teaduse tippkeskuste arendamise meetme Arvutiteaduse tippkeskus EXCS (juuli 2008–aug. 2015)
- juhttoimkonna liige, COSTi aktsioon IC0701 (märts 2008–märts 2010)
- projekti juht, RAKi meetme 1.1 IKT doktorikooli projekt (sept. 2005–juuni 2008)
- Kübi rühma juht, FP6 IST integreeritud projekt MOBIUS (sept. 2005–aug. 2009)

- Kübi rühma juht, FP6 IST koordineeritud projekt TYPES (sept. 2004–apr. 2008)
- Kübi rühma juht, FP5 IST temaatiline võrgustik APPSEM II (jaan. 2003–juuni 2006)
- tööühma juht, HTMi teaduse tippkeskus Töökindlate Arvutisüsteemide Uurimise keskus CDC (nov. 2002–dets. 2007)
- projekti asejuht (teadus- ja arendusjuht), Kübi koordineeritud FP5 IST kaasnevate meetmete projekt eVikings II (nov. 2002–sept. 2005)
- Univ. do Minho, INRIA Sophia Antipolise saitide kaudu liige, FP5 IST temaatiline võrgustik TYPES (aug. 2000–juuli 2003)

Grandid

- ETFi uurimisprojekti-grant nr. 6940, Tüübisüsteemid, programmioloogikad ja usaldusväärne koodigenerereerimine (jaan. 2007–dets. 2010)
- Royal Society projektigrant Programmeerimine algebrate, koalgebrate, monaadide ja komonaadidega (juuli 2003–juuni 2005)
- Eesti-Prantsuse koostööprogrammi *Parrot* projektigrant Tüübid ja tõestused ohutus tarkvaras (jaan. 2003–dets. 2004)
- ETFi uurimisprojekti-grant nr. 5567, Mitteklassikalised loogikad ja programmeerimisteooria (jaan. 2003–dets. 2006)
- järel doktorantuuri grant Minho Ülikoolilt, Portugali Teadus- ja Tehnoloogiafondilt (FCT) (2 aastat, apr. 2000–apr. 2002)
- ETFi uurimisprojekti-grant nr. 4155, Intermediaar- ja modaalloogikad programmikeelte teoorias ja formaalmeetodites (jaan. 2000–dets. 2002)
- KTH täisgrant doktoriõpinguteks, nn. excellenstjänst (4 nominaalaastat 100% õpingukoormusega = 5 füüsilist aastat 80% õpingukoormusega, sept. 1992–aug. 1997)
- kaks reisitoetust EITSAIt, 2002, reisitoetus EITSAIt, 2004, kaks reisitoetust EITSAIt, 2006, reisitoetus EITSAIt, 2007, reisitoetus EITSAIt, 2008, reisitoetus EITSAIt, 2009, välisõppejõu kutsumise toetus EITSAIt, sügis 2003, välisõppejõu kutsumise toetus EITSAIt, kevad 2005
- reisistipendium Soome Sihtasutuselt, 1992

Tunnustused, auhinnad

Auhinnad:

- TTÜ 2009. a parima publikatsiooni konkursi 2.-3. koht täppisteaduste valdkonnas, 2010
- TTÜ Arengufondi Boris Tamme stipendium, 2002

Muud tunnustused:

- kutsutud kõneleja, 2009 Int. Conf. on Category Theory, CT 2009 (Cape Town, juuni/juuli 2009)
- kutsutud kõneleja, nõupidamine "Logik in der Informatik 14"(Braunschweig, nov. 2007)
- kutsutud kõneleja, 4th Int. Wksh. on Higher-Order Rewriting, HOR '07 (Pariis, juuni 2007)
- kutsutud vaateleja, IFIP WG 2.1 nõupidamine nr. 62 (Namur, dets. 2006), nr. 65 (Povoa de Lanhoso, jaan. 2010)
- kutsutud vaateleja, IFIP WG 2.8 nõupidamine nr. 23 (Dedham, MA, juuli 2006)
- kutsutud vaateleja, IFIP WG 2.2 nõupidamine (Skagen, aug./sept. 2005)
- kutsutud kõneleja, sümposium 2003 Assoc. for Symbolic Logic European Summer Meeting, Logic Colloquium '03 (Helsinki, aug. 2003)

Keelteoskus

Valdab vabalt eesti, inglise, rootsi, vene keelt; saab raskusteta aru norra, soome keelest, mõningal määral portugali keelest.

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