

# Helger Lipmaa's Curriculum Vitae

## Personal Particulars

1. Name: Helger Lipmaa
2. Citizenship: Estonian
3. Address:
  - Simula UiB, Thormøhlensgate 55, N-5008 Bergen, Norway
  - email: `firstname.lastname[at]gmail.com`
  - WWW: <http://www.cs.ut.ee/~lipmaa>
4. Education: PhD, University of Tartu, 1999
5. Language skills: Estonian (native), English (fluent), Russian (passive)
6. Affiliation:
  - (a) Senior research scientist, Simula UiB, Norway
  - (b) Research professor (20%), University of Tartu, Estonia

## Work Experience

- 1989** Computer lab manager, Pärnu, Estonia.
- 1991–1991** Programmer, Pärnu Commerce Bank, Estonia.
- 1992–1992** Programmer, MesoCom Ltd (large scale databases), Estonia.
- 1994–1995** System-administrator and webmaster at the Department of Mathematics, University of Tartu, Estonia (Linux, WWW, ...).
- 1995–1995** Junior researcher at Institute of Computer Science, University of Tartu (complexity theory), Estonia.
- 01.11.1995–12.12.1995** Senior assistant at Institute of Computer Science, University of Tartu (complexity theory), Estonia.
- 12.11.1996–28.07.1997** Junior researcher at Institute of Cybernetics, Tallinn (cryptography), Estonia.
- 01.08.1997–31.03.2000** Senior research engineer at Küberneetika AS, a state-owned research and development company, a spin-off of Institute of Cybernetics (cryptography), Estonia.
- 01.02.2000–31.03.2001** Half-time lecturer (assistant professor) at Institute of Computer Science, University of Tartu, Estonia.
- 01.04.2000–31.07.2000** Researcher at Telecommunications Software and Multimedia Laboratory (TML), Helsinki University of Technology, Finland. (50%)
- 01.08.2000–31.07.2001** Senior researcher at the TML, Helsinki University of Technology, Finland.
- 01.08.2001–31.12.2004** Professor (pro tem) at the Laboratory for Theoretical Computer Science, Helsinki University of Technology, Finland.
- 01.01.2005–31.03.2005** Teaching researcher at the Laboratory for Theoretical Computer Science, Helsinki University of Technology, Finland.
- 01.04.2005–31.08.2006** Senior researcher, Cybernetica AS, Estonia.
- 01.04.2005–31.08.2006** Professor, University of Tartu, Estonia. (50%)
- 01.09.2006–31.07.2008** Senior lecturer, University College London, UK.
- 01.08.2008–31.07.2011** Senior researcher, Cybernetica AS, Estonia.
- 15.09.2008–31.08.2009** Docent (associate professor), University of Tartu, Estonia. (25%)
- 01.11.2009–2011** Professor, Tallinn University, Estonia. (30%)
- 01.08.2011–31.12.2013** Senior research fellow, University of Tartu, Estonia.
- 01.01.2014–31.07.2019** Research professor, University of Tartu, Estonia.
- 01.09.2015–31.08.2019** Lead research fellow, Smartmatic-Cybernetica Centre of Excellence for Internet voting. (10%) (<http://www.ivotingcentre.ee/>)
- 01.08.2019–...** Research professor (20%), University of Tartu, Estonia.
- 01.08.2019–...** Senior research scientist, Simula UiB, Norway.

## Awards and main achievements (incomplete)

This also includes awards of my students:

- 1987** Seventh place at the Estonian Chemistry Olympiad.
- 1988** Fourth place at the Estonian Mathematics Olympiad.
- 1990** Third place at the Estonian Mathematics Olympiad, fourth place at the Estonian Olympiad of Informatics. Member of the Estonian team at the Soviet Informatics Olympiad.
- 1992** Award from INTENTIA Dataarkitekten AB for successful studies.
- 1993** Finished undergraduate studies in 3 years instead of 4 (5/5 grades in all mathematical subjects).
- 1998** My first ever submitted paper was accepted to CRYPTO, the leading annual cryptographic conference (acceptance ratio 22.9%).
- 1998** Award from Estonian Science Foundation, Commission for Exact Sciences, for successful research.
- 1999** Publication “Time-stamping with Binary-linking schemes” was the only publication of high-importance from Institute of Computer Science, University of Tartu, mentioned in “Overview of Estonian Research and Development, 1996–1999”.
- 1999** Award from Estonian Science Foundation, Commission for Exact Sciences, for successful research.
- 2000** Publication “Accountable Certificate Management using Undeniable Attestations” (ACM CCS 2000) invited to the Journal of Computer Security as one of the three best papers of ACM CCS 2000, a leading conference on general data security. (ACM CCS 2000 had acceptance ratio 21.4%)
- 2000** My student Oleg Mürk got an award from Estonian Academy of Sciences for successful research during undergraduate studies.
- 2001** Professor (pro tem) position at the Helsinki University of Technology at age 29, probably one of the youngest professors at this university.
- 2005** My student Johan Wallén got the Best Finnish Computer Science MSc Thesis Award by The Finnish Society for Computer Science.
- 2005** My work on cryptographic protocols was named as one of the two main achievements of the Institute of Computer Science, University of Tartu, 2005. (Another main achievement was Peeter Laud’s work, with papers in ACM CCS 2005 etc.)
- 2006** My student Ago-Erik Riet won a prestigious stipend from Skype to continue graduate studies at the Cambridge University.
- 2006** Senior lecturer position at University College London, one of top 25 universities in the world.
- 2009** My student Ho Bae (UCL) has won the best paper award at a competition run by the National Intelligence Service of the Republic of Korea. The topic is related to Private Information Retrieval.
- 2010–2012** Member of the Board of Directors of International Association of Cryptologic Research.
- 2011** My student Bingsheng Zhang (Tartu) finished his PhD studies in two years (expected: four), having 8 papers.
- 2012** Our paper (coauthored with my ex-student Bingsheng Zhang), published at SCN 2012, was one of the best papers that were further invited to the Journal of Computer Security
- 2014** Our paper (coauthored with my PhD student Prastudy Fauzi and ex-student Bingsheng Zhang), published at FC 2014, was one of the best papers that were further invited to the journal “Information Security”
- 2016** My paper at AFRICACRYPT 2016 was invited to “International Journal of Applied Cryptography” as one of the best papers
- 2016** My paper at ASIACRYPT 2017 (coauthors: members of my group, including two PhD students) was invited to “Journal of Cryptology” as one of the three best papers
- 2017** My student Prastudy Fauzi (Tartu) got a postdoc position in Aarhus, one of the top cryptography groups in Europe

## Organisational activities and services to community

- A member of the IACR (International Association for Cryptologic Research). Member of the board of directors in 2010–2011.
- Doctoral school in computer science at University of Latvia, foreign representative for the governing board of the school.
- External reviewer for the next grant organisations: Hongkong’s Research Grants Council (Competitive Earmarked Research Grant).
- Membership in steering committees: Nordic Workshop on Secure IT Systems (annual, Nordsec, 2002...), the Estonian Winter School in Computer Science (annual, 1998...), Estonian Theory

Days (twice a year, 2002...).

- Member of editorial board: Baltic Journal of Modern Computing (<http://www.lu.lv/baltic-journal-of-modern-computing/editorial-board/>)
- General chair: *Eurocrypt 2011 (Tallinn, Estonia, 2011)*, Ecrypt II Hash function workshop (Tallinn, Estonia, 2011 — with Andrea Röck), VOTEID 2011 (Tallinn, Estonia, 2011), NordSec 2017 (Tartu, Estonia, 2017).
- Program Committee chair: Estonian Winter School in Computer Science 1998 (Palmse, Estonia), Seminar on Network Security 2002 (Sjökulla, Finland), NordSec 2005 (Tartu, Estonia — with Dieter Gollman), Inscrypt 2006 (Beijing, China — with Moti Yung), VoteID 2011 (Tallinn, Estonia — with Aggelos Kiayias), NordSec 2017 (Tartu, Estonia — with Katerina Mitrokotsa).
- Program Committee memberships (as a non-chair): SAC 2002 (St. John's, Newfoundland, Canada), FC 2003 (Guadeloupe), *FSE 2003 (Lund, Sweden)*, WISA 2003 (Jeju Island, Korea), ISC 2003 (Bristol, UK), NordSec 2003 (Gjøvik, Norway), IWAP 2003 (Kokura, Japan), INDOCRYPT 2003 (Delhi, India), FC 2004 (Key West, FL, USA), ACNS 2004 (Yellow Mountain, China), *ACM CCS 2004 (Washington, D.C., USA)*, Privacy and Security Aspects of Data Mining 2004 (Brighton, UK), NordSec 2004 (Helsinki, Finland), FC 2005 (Roseau, The Commonwealth Of Dominica), *CT-RSA 2005 (San Francisco, CA, USA)*, ISC 2005 (Singapore), PSDM 2005 (New Orleans, LA, USA), ICISC 2005 (Seoul, Korea), FC 2006 (Anguilla BWI), *Eurocrypt 2006 (St Petersburg, Russia)*, WISA 2006 (Jeju Island, Korea), ISC 2006 (Samos Island, Greece), NordSec 2006 (Linköping, Sweden), ICISC 2006 (Busan, Korea), PADM 2006 (Hong Kong, China), *CT-RSA 2007 (Berkeley, Ca, USA)*, WCC 2007 (Circester, UK), PADM 2007 (Omaha, USA), ISC 2007 (Valparaiso, Chile), ProvSec 2008 (Shanghai, China), Indocrypt 2008 (Kharagpur, India), AFRICACRYPT 2009 (Gammarth, Tunisia), ProvSec 2009 (Guangzhou, China), CANS 2009 (Kanazawa, Japan), RLCPS 2010 (Tenerife, Spain), FC 2010 (Tenerife, Spain), *CT-RSA 2010 (Berkeley, USA)*, *Eurocrypt 2010 (Monaco)*, ESSCAS 2010 (Pedase, Estonia), NordSec 2010 (Helsinki, Finland), FC 2011 (St Lucia), RLCP 2011 (St Lucia), ESSCAS 2011 (Pedase, Estonia), ECML/PKDD 2011 (Athens, Greece), NordSec 2011 (Tallinn, Estonia), CANS 2011 (Sanya, China), FC 2012 (Bonaire, Netherlands Antilles), AFRICACRYPT 2012 (Ifrane, Morocco), Nordsec 2012 (Sweden), VOTEID 2013 (Surrey, UK), ISC 2013 (Dallas, USA), FC 2014 (Barbados), CANS 2014 (Heraklion, Greece), FC 2015 (San Juan, Puerto Rico), Cryptography and Coding 2015 (Oxford, UK), MFCS 2016 (Krakow, Poland), ISC 2016 (Honolulu, USA), VOTING 2017 workshop (Malta), IMA CC 2017 (Oxford), PLLS 2018 (Pärnu, Estonia), *Asiacrypt 2018 (Brisbane, Australia)*, FC 2019 (Saint Kitts, Saint Kitts and Nevis), *PKC 2019 (Beijing, China)*, PENCIL 2019 (Darmstadt, Germany), *Asiacrypt 2019 (Kyoto, Japan)*, FC 2020, *PKC 2020 (Edinburgh, UK)*, *Asiacrypt 2020 (Daejeon, South Korea)*.
- Session organizer: cryptography session at CIE 2017 (Turku, Finland).
- Session chair: Information Security Conference 2002 (São Paulo), *Fast Software Encryption 2003 (Lund, Sweden)*, NordSec 2003 (Gjøvik, Norway), Financial Cryptography 2004 (Key West, FL, USA), *Public Key Cryptography 2004 (Singapore)*, NordSec 2004 (Espoo, Finland), *ICALP 2005 (Lisboa, Portugal)*, ICICS 2005 (Beijing, China), CANS 2005 (Xiamen, China), *Eurocrypt 2006 (St Petersburg, Russia)*, Inscrypt 2006 (Beijing, China), CANS 2008 (Hong Kong, China), VOTEID 2009 (Luxembourg), NordSec 2009 (Oslo, Norway), *Eurocrypt 2010 (Monaco)*, *ESORICS 2010 (Athens, Greece)*, PQCrypto 2011 (Taipei, Taiwan), SCN 2012 (Amalfi, Italy), *ICALP 2013 (Riga, Latvia)*, *Asiacrypt 2013 (Bangalore, India)*, FC 2014 (Bridgetown, Barbados), AFRICACRYPT 2016 (Fez, Morocco), PENCIL 2019 (Darmstadt, Germany). Estonian Winter School in Computer Science and Estonian Theory Days and Estonian Theory Days (many times).
- Rump session chair: Inscrypt 2006 (Beijing, China).
- The rest:
  - One of the organisers of the 1998 cryptography seminars in Tartu.
  - One of the organisers of the 1998-99 quantum computing seminars in Tartu.
  - One of the organisers of the 2000 seminar on the “Information Technology And Its Business Aspects” in Tartu.

## Visibility

- As of 19.11.2019, according to Scholar.Google.Com, I have 4145 citations and H-index 32. (See <http://www.ut.ee/~lipmaa/cites/> for more information.)

## Grants

As a grant owner:

**1994** Tempus S\_JEP-06145-94 grant, 3 month study period in Aarhus University, Complexity Theory.

**1996** Tempus Individual Mobility Grant, 4.5 month study period in Aarhus University.

**1997** Estonian Science Foundation grant, “Research and Studies in the Field of Cryptology”.

**2000** Senior researcher grant from TEKES (Finnish National Technology Agency) for one year. Results: three papers.

**2001** AWACS-HUT grant for two months (Nokia). Results: two papers and one patent application.

**2001–2005** Scientific leader of the Krypto project at the HUT, funded by the Finnish Defence Forces.

From 2002 to 2004 employed Markku-Juhani O. Saarinen and Johan Wallén, in 2005 employed Johan Wallén and Emilia Käsper. (From April 1, 2005, project was led by prof. Kaisa Nyberg.)

**2004–2007** Cryptology and Data-mining (CRYDAMI) project, HUT, funded by the Finnish Academy of Sciences. Employed one PhD student (Sven Laur). (From April 1, 2005, project was led by prof. Kaisa Nyberg.)

**2005–2007** Base funding grant from the University of Tartu to start up a new research project. Subject: “Cryptographic protocols”.

**2006–2008** ETF (Estonian Science Foundation) grant 6848, “Privacy-Preserving Data Mining: Cryptographic Methods.”

**2009–2011** ETF (Estonian Science Foundation) grant 8058, “Efficient Cryptocomputing.”

**2012–2014** ETF (Estonian Science Foundation) grant 9303, “Efficient and Secure Cryptographic Protocols.”

**2018–** Leader, PUT grant “Cryptographic protocols and coding theory”

As one of the main researchers (but not grant owner, very incomplete):

**1994–95** Estonian Science Foundation grant. no. 1203, “Counting hierarchy and complexity of Boolean formulae with quantifiers”. (Grant owner: Mati Tombak)

**1998** Estonian Science Foundation grant 3742, “Digital Time-Stamping”.

**1999** Phare HESR grant “Time-Stamping Server”. Results (combined with the previous grant): 3 papers, PhD thesis and one patent application.

**2004–2005** Participant of the GO-SEC project (HUT, funded by the Tekes), 8 months. Employed one MSc student (Emilia Käsper).

**2006–2010** Target funding “Theoretical and Practical Security of Heterogeneous Information Systems” (grant owner Ahto Buldas)

**2013–2018** Institutional Research Funding IUT2-1 “Provably Secure and Verifiable Systems” (grant owner Dominique Unruh)

**2013–2015** ICT Programme grant, “Quantum cryptography beyond key distribution” (grant owner Dominique Unruh)

**2013–** Estonian representative of the COST action “Computational Social Choice”

**2013–2018** Estonian representative of the COST action “Cryptology for Secure Digital Interaction”

**2015–** Estonian representative of the COST action “Cryptanalysis of ubiquitous computing systems (CRYPTACUS)”

**2015–2019** Site coordinator of the H2020 Project “Panoramix”

**2018–2019** Site coordinator of the H2020 Project “Privacy-Enhancing Cryptography in Distributed Ledgers (PRIViLEDGE)”

## Teaching qualifications

1. As the principal investigator from University of Tartu, participated in creating a joint Nordic Master Programme in data security and mobile computing, NordSecMob, <http://nordsecmob.tkk.fi/>
2. Pedagogical training: attended a course on Didactics of Informatics (1992)
3. Practical experience of teaching:

- Lead several exercise sessions in 1994... 1996
- Taught lecture courses:
  - “Introduction to Cryptology”, Tallinn Technical University, Spring 1997. (2 hours a week)
  - “Cryptology”, University of Tartu, Autumn 1997. (2 hours a week)
  - “Cryptology”, University of Tartu, Spring 2000. (2 hours a week). Course notes in Estonian.
  - “Seminar on Network Security”, Helsinki University of Technology (HUT), Autumn 2000.
  - “Methods of Cryptology”, HUT, Spring 2001. (2 hours a week)
  - “Special Course on Cryptology”, HUT, Autumn 2001–2003. (2 hours a week)
  - “Seminar on Cryptology and Security Protocols”, HUT, Autumn 2001.
  - “Cryptography and Data Security”, HUT, Spring 2002–2004. (3 hours a week) Slides in English
  - “Cryptology: Special Topics”, HUT, Spring 2002–2005. (2 hours a week)
  - “Postgraduate Course in Theoretical Computer Science”, HUT, Autumn 2004. (2 hours a week)
  - “Research Seminar in Cryptography”, University of Tartu, Autumn 2005. (2 hours a week) — student evaluation 4.67/5 (average in Institute: 3.64/5)
  - “Cryptographic Protocols”, University of Tartu, Spring 2006. (2 hours a week)
  - “Graduate Seminar in Cryptography”, University of Tartu, Spring 2006. (2 hours a week)
  - “Crypto II”, University College London, Spring 2008. (total 30 hours)
  - “Graduate Seminar in Cryptography”, University of Tartu, Autumn 2008. (2 hours a week)
  - “Research Seminar in Cryptography”, University of Tartu, Spring 2009. (2 hours a week)
  - “Cryptographic Protocols”, University of Tartu, Fall 2011, 2012, 2013, 2014, 2015, 2016, 2018. (2 hours a week)
  - “Complexity Theory”, University of Tartu, Fall 2012 and 2013. (2 hours a week)
- Lecture courses in summer/winter schools:
  - “Zero-knowledge: theory and applications” in Nordic Research Training course “Cryptology and Its Applications”, Bergen, June 10-18, 2004
  - Lecture course on cast-as-intended e-voting in the Second International Summer School on Secure Voting, SecVote 2012, Dagstuhl, July 16–20, 2012
  - “ZK-SNARKs: foundations and applications”, Number theory and coding theory: Contemporary applications in security, Turku, Finland, May 28 — July 1, 2018
- PhD theses supervised and defended: Sven Laur (2008, Helsinki University of Technology), Bingsheng Zhang (2011, University of Tartu), Prastudy Fauzi (2017, University of Tartu), Rafik Chaabouni (2017, EPFL).
- BSc/MSc theses supervised:
  - From the University of Tartu: Piret Ulp (BSc in 1998, cum laude), Meelis Roos (MSc in 1999, cum laude), Priit Karu (semester work 1999, BSc 2000, cum laude), Rasmus Alop (semester work 1999), Oleg Mürk (semester work, 2000, for this Oleg won an award from Estonian Academy of Sciences; BSc thesis, 2001, cum laude), Sven Laur (MSc thesis 2002, cum laude), Emilia Käsper (MSc 2006, Prastudy Fauzi (MSc, 2012, Complexity Analysis of Hardware-Assisted Attacks on A5/1), Kairi Kangro (BSc 2013), Hendri (MSc 2013), Janno Siim (MSc 2016), Annabell Kuldmaa (MSc 2017), Shahla Atapoor (MSc 2019).
  - From the Helsinki University of Technology: Lauri Tarkkala (MSc in 2001), Johan Wallén (MSc in 2003, the Best Finnish Computer Science MSc Thesis Award by The Finnish Society for Computer Science, 2005)
  - From the University College London: Ho Bae (the best paper award at a competition run by the National Intelligence Service of the Republic of Korea) and Bingsheng Zhang (co-supervisor with Jens Groth, MSc 2008).
- Current students: Janno Siim (PhD student, University of Tartu, started in September 2016), Behzad Abdolmaleki (PhD student, Tartu, started in April 2016), Karim Bagheri (PhD student, Tartu, started in September 2016) in Tartu. Arne Tobias Malkenes Ødegaard in Bergen.
- Joint papers with students (while they were students): 6 with Sven Laur, 2 with Johan Wallén,

- 2 with Bingsheng Zhang, 2 with Rafik Chaabouni, 5 with Prastudy Fauzi, 4 with Janno Siim, 3 with Karim Baghery, 3 with Behzad Abdolmaleki.
- Opponent/reviewer of the following theses:
    - Jan Willemson (PhD thesis “Size-efficient Interval Time Stamps”, University of Tartu, 2002).
    - Lan Duy Nguyen (PhD thesis “Cryptographic-based Privacy Enhancing Technology”, University of Wollongong, Australia, 2005).
    - Mårten Trolin (PhD thesis “Electronic Cash and Hierarchical Group Signatures”, KTH, Sweden, 2006).
    - Margus Niitsoo (PhD thesis “Black-box Oracle Separation Techniques with Applications in Time-stamping”, University of Tartu, Estonia, 2011).
    - Björn Terelius (PhD thesis “Some Aspects of Cryptographic Protocols with Applications in Electronic Voting and Digital Watermarking”, KTH, Sweden, 2015).
    - Bernardo David (PhD thesis “A Framework For Efficient Homomorphic Universally Composable Commitments”, University of Aarhus, Denmark, 2017).
    - Anca Nitelescu (PhD thesis “A tale of SNARKs: quantum resilience, knowledge extractability and data privacy”, ENS, France, 2019).
  - Participant in PhD committees (*not* including Estonia):
    - Salerno, Italy, 15.04.2012. (5 defenses, including two in cryptography: Angelo De Caro, Alessandra Scafuro)
4. Produced teaching materials: two books in Estonian, slides for various courses. One book chapter on e-voting in “The Handbook of Information Security” (Wiley, 2005).
  5. Member of the Steering and Program Committee of the Estonian Winter School of Computer Science (1998–2010), organiser of the Estonian Theory Days (since 2002), and various extra-curriculum seminars in Estonia in 1998...2000.
  6. Organised the next mini-courses at the Helsinki University of Technology: “Provable Security” (Phil Rogaway, 2002), “Quantum Computation” (Andris Ambainis, 2002), “Design of AES” (Vincent Rijmen, 2003), at the University of Tartu: “Selected Topics in Algorithmic Game Theory” (Edith Elkind, 2005), “Software Obfuscation” (Yury Lifshits, 2006), and at the Tallinn University: “Algorithmic Game Theory” (Edith Elkind, 2010).

## Impact in practice

- Governmental projects
  - Participant in time-stamping project (1997–2000; other members: Ahto Buldas, Jan Willemson, Peeter Laud, Meelis Roos, Arne Ansper, ...) that was initiated to create the necessary technical background to the Estonian Law of Digital Signatures. The law is in force since December 2000.
  - Contractor for Estonian government, electronic voting project, 2001. Member of the e-voting project, 2003. Contractor in new e-voting project, 2012.
  - Participated in the preparation of the Norwegian Internet voting project, 2009. We proposed the setting (specified in our Esorics 2010 publication) that was/is in Norway.
- Patent applications (both cancelled for various reasons):
  - U.S. patent application. Application No. 09,375,935 for: TIME-STAMPING WITH BINARY LINKING SCHEMES. File No.: A-66712. (Inventors Ahto Buldas, Peeter Laud, Helger Lipmaa and Jan Villemson).
  - 1 more patent application (Nokia) was withdrawn.
- Member of the Technical Advisory Board, GuardTime
- Standardisation activities: my work, co-authored with Buldas et al., on time-stamping has been under standardisation in the ISO SC27 work group. I was an active participant of the AES (Advanced Encryption Standard) process (publications [13,81,97]).

## Additional studies and research visits (incomplete)

- 1987–1990** The school of exact sciences (mathematics exercises of olympiad level, graded by university teachers).
- 1987–1990** Member of the Research Union of School Students (mathematics).
- 1989–1990** Chemistry club at the high school.
- 1989–1990** Training sessions for mathematics olympiads. (Lectures and laboratories by university professors etc.)
- 1994** DAIMI, Aarhus University, Denmark (3 months, complexity theory)
- 1996** DAIMI, Aarhus University, Denmark (4.5 months, complexity theory and cryptography)
- 1997** New Trends in Computer Science and Information Technology, Palmse (1 week)
- 1997** School on Natural Computation, Turku (1 week)
- 1998** Parallel and Quantum Computation, Palmse, Estonia (1 week)
- 1998** Summer School in Cryptography and Data Security, Aarhus, Denmark (1 week)
- 1999–2005** Estonian Winter School in Computer Science (Palmse, Estonia, à 1 week)
- 2000** Nevanlinna Prize Special Event, Helsinki, Finland (1 day)
- 2000** Tutorial “Network Security and IPsec” (J. Ioannides (AT&T) and A. Keromytis (Univ. of Pennsylvania)), Athens, Greece
- 2000** Tutorial “Electronic Payment Technologies” (Y. Frankel, eCash Technologies), Athens, Greece
- 2002** Tutorial “Constructive Applications of the Weil and Tate Pairings” (Alfred Menezes, University of Waterloo), Hyderabad, India
- 2004** “The State of Art in Stream Ciphers”, (Brugge, Belgium, 3 days)
- 2005** Two-week research visit to I2R, Singapore.
- 2007** Two-week research visit to CUHK, Hong Kong.
- 2008** Three-week research visit to Tsinghua University, China.
- 2009** Short research visit to Macquarie University, Australia.
- 2011** Short research visit to NTU, Singapore.
- 2013** Short research visit to University of Latvia.
- 2014** Research visit (3 weeks) to University of Athens, Greece.
- 2014** Short research visit to Aalto University, Finland.
- 2015** Short research visit to University of Turku, Finland.
- 2016** Short research visit to University of Warsaw, Poland.
- 2017** Two-week research visit to University of Athens, Greece.
- 2018** Research visit to Simula UiB, Norway.

## Other information

- Computer experience: started active programming during the high school (assembly coding for 6502 and Z80, finished a few games and partial game development environments for two different home computers). Programmed in many programming languages (including some constructed by myself) and operating systems (including Apple DOS, CP/M, MSX DOS, MS DOS and derivatives, VMS, different Unix platforms). Most of the research is backed by actual computer implementations. Author of the world’s fastest implementations of several block ciphers, most importantly AES, for the early Pentium family (Pentium Pro, Pentium MMX, Pentium II) of microprocessors.

## Publications

### Books

1. Vello Hanson, Ahto Buldas, Tarvi Martens, Helger Lipmaa, Arne Ansper, Viljar Tullit, “Infosüsteemide turve I. Turvarisk” Küberneetika AS, 1997, 125 pages [“Security of Information Systems I.”, book, in Estonian. This and the next book can be bought online at <http://www.raamatukoi.ee/cgi-bin/kirjastus?300>]
2. Vello Hanson, Ahto Buldas, Tarvi Martens, Helger Lipmaa, Arne Ansper, Viljar Tullit, “Infosüsteemide turve II. Turbetehnoloogia” Küberneetika AS, 1998, 372 pages [“Security of Information Systems II”, book, in Estonian]

## Chapters in Books

3. Helger Lipmaa, “Kvantarvutid”, Eesti Füüsika Seltsi 9. aastaraamat, 1999, pp. 102–125 [“Quantum Computing”, Ninth Annual of the Estonian Physics Society. In Estonian. Invited paper.]
4. Helger Lipmaa. Secure Electronic Voting Protocols. A chapter from The Handbook of Information Security, volume 2, pages 647–657, Hossein Bidgoli, Editor-in-Chief. John Wiley & Sons, Inc., 2005.

## Edited Books and Proceedings

5. Helger Lipmaa, Heidi Pehu-Lehtonen, ‘Mobile security : proceedings of the Helsinki University of Technology Seminar on Network Security’, Fall 2000. Espoo, Helsinki University of Technology, 2000.
6. Helger Lipmaa, Moti Yung, editors, “Inscrypt 2006”, volume 4318 of *LNCS*, Springer, December 2006.
7. Aggelos Kiayias, Helger Lipmaa, editors, “VoteID 2011”, volume 7397 of *LNCS*, Springer.
8. Helger Lipmaa, Aikaterini Mitrokotsa, Raimundas Matulevicius: Secure IT Systems - 22nd Nordic Conference, NordSec 2017, Tartu, Estonia, November 8-10, 2017, Proceedings. Lecture Notes in Computer Science 10674, Springer 2017, ISBN 978-3-319-70289-6

## Thesis

8. Master thesis “Survey on the communication complexity”, University of Tartu, 1995 (in Estonian)
9. PhD thesis “Secure and Efficient Time-Stamping Systems”, University of Tartu, 1999.

## Refereed proceedings and journals

10. Helger Lipmaa. IDEA: A cipher for multimedia architectures? In Stafford Tavares and Henk Meijer, editors, *Selected Areas in Cryptography '98*, volume 1556 of *LNCS*, pages 248–263, Kingston, Canada, 17–18 August 1998. Springer, Heidelberg.
11. Ahto Buldas, Peeter Laud, Helger Lipmaa, and Jan Villemson. Time-Stamping with Binary Linking Schemes. In Hugo Krawczyk, editor, *CRYPTO 1998*, volume 1462 of *LNCS*, pages 486–501. Springer, Heidelberg, 1998.
12. Ahto Buldas, Helger Lipmaa, and Berry Schoenmakers. Optimally Efficient Accountable Time-Stamping. In Hideki Imai and Yulieng Zheng, editors, *Public Key Cryptography '2000*, volume 1751 of Lecture Notes in Computer Science, pages 293–305, Melbourne, Australia, 18–20 January 2000. Springer Verlag.
13. Kazumaro Aoki and Helger Lipmaa. Fast Implementations of AES Candidates. In *Third AES Candidate Conference*, New York City, USA, 13–14 April 2000.
14. Ahto Buldas, Peeter Laud, and Helger Lipmaa. Accountable Certificate Management using Undeniable Attestations. In Sushil Jajodia and Pierangela Samarati, editors, *7th ACM Conference on Computer and Communications Security*, pages 9–18, Athens, Greece, 1–4 November 2000. ACM Press. **Invited to Journal of Computer Security as one of the three best papers.**
15. Helger Lipmaa and Shiho Moriai. Efficient Algorithms for Computing Differential Properties of Addition. In Mitsuru Matsui, editor, *Fast Software Encryption 2001*, volume 2355 of *LNCS*, pages 336–350, Yokohama, Japan, 2–4 April 2001. Springer, Heidelberg, 2002.
16. Helger Lipmaa, N. Asokan, Valtteri Niemi, Secure Vickrey Auctions without Threshold Trust. In Matt Blaze, editor, *Financial Cryptography 2002*, volume 2357 of *LNCS*, Southampton Beach, Bermuda, 11–14 March 2002. Springer, Heidelberg.
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23. Edith Elkind and Helger Lipmaa. Interleaving Cryptography and Mechanism Design: The Case of Online Auctions. In Ari Juels, editor, *Financial Cryptography — Eighth International Conference*, volume 3110 of *Lecture Notes in Computer Science*, pages 117–131, Key West, FL, USA, February 9–12 2004. Springer, Heidelberg.
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- und Praxis*”, part of the conference *Sicherheit 2006*, volume ? of ?, pages 270–278, Magdeburg, Germany, February 20–22, 2006.
35. Sven Laur, Helger Lipmaa and Taneli Mielikäinen. Cryptographically Private Support Vector Machines. In Lyle Ungar, Mark Craven, Dimitrios Gunopulos and Tina Eliassi-Rad, editors, *The Twelfth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, KDD 2006*, pages 618–624, Philadelphia, USA, August 20–23, 2006. ACM.
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  49. Rafik Chaabouni, Helger Lipmaa and Abhi Shelat. Additive Combinatorics and Discrete Logarithm

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  61. Prastudy Fauzi, Helger Lipmaa and Bingsheng Zhang. Efficient Non-Interactive Zero Knowledge Arguments for Set Operations. In Nicolas Christin and Rei Safavi-Naini, editors, *FC 2014*, volume ? of Lecture Notes in Computer Science, pages ?–?, Barbados, March 3–7, 2014. Springer, Heidelberg.
  62. Helger Lipmaa. Efficient NIZK Arguments via Parallel Verification of Benes Networks. In Michel Abdalla and Roberto de Prisco, editor, *SCN 2014*, volume 8642 of Lecture Notes in Computer Science, pages 416–434, Amalfi, Italy, September 3–5, 2014. Springer, Heidelberg.
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  64. Aggelos Kiayias, Nikos Leonardos, Helger Lipmaa, Kateryna Pavlyk and Qiang Tang. Communication Optimal Tardos-based Asymmetric Fingerprinting. In Kaisa Nyberg, editor, *CT-RSA 2015*,

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  66. Helger Lipmaa and Kateryna Pavlyk. Analysis and Implementation of An Efficient Ring-LPN Based Commitment Scheme. In David Naccache and Mike Reiter, editors, *CANS 2015*, volume ? of Lecture Notes in Computer Science, pages ?–?, Marrakesh, Morocco, December 8–12, 2015. Springer, Heidelberg.
  67. Prastudy Fauzi and Helger Lipmaa. Efficient Culpably Sound NIZK Shuffle Argument without Random Oracles. In Kazue Sako, editor, *CT-RSA 2016*, volume 9610 of Lecture Notes in Computer Science, pages 200–216, San Francisco, CA, USA, February 29–March 4, 2016. Springer, Heidelberg.
  68. Helger Lipmaa. Prover-Efficient Commit-And-Prove Zero-Knowledge SNARKs. In David Pointcheval, editor, *AFRICACRYPT 2016*, volume 9646 of Lecture Notes in Computer Science, pages 185–206, Fes, Morocco, April 13–15, 2016. Springer, Heidelberg. **Invited to Journal of Applied Cryptography as one of the three best papers.**
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  72. Helger Lipmaa and Kateryna Pavlyk. A Simpler Rate-Optimal CPIR Protocol. In Aggelos Kiayias, editor, *FC 2017*, volume 10322 of Lecture Notes in Computer Science, pages 621–638, Malta, April 3–7, 2017. Springer, Heidelberg.
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  79. Behzad Abdolmaleki, Helger Lipmaa, Janno Siim and Michał Zając. On QA-NIZK in the BPK

model. In Aggelos Kiayias, Markulf Kohlweiss, Petros Wallden and Vassilis Zikas, editors, *PKC 2020 (1)*, volume 12110 of Lecture Notes in Computer Science, pages 590–620, Edinburgh, UK, May 4–7, 2020. Springer, Cham.

80. Helger Lipmaa. Key-and-Argument-Updatable QA-NIZKs. In Clemente Galdi and Vladimir Kolesnikov, editor, *SCN 2020*, volume 12238 of Lecture Notes in Computer Science, pages 645–669, Amalfi, Italy, September 14–16, 2020. Springer, Cham.

#### Non-refereed workshops and invited papers (with publications)

81. Helger Lipmaa, Phillip Rogaway, and David Wagner. Comments to NIST Concerning AES-modes of Operations: CTR-mode Encryption. In *Symmetric Key Block Cipher Modes of Operation Workshop*, Baltimore, Maryland, US, 20 October 2000. Electronic proceedings available from <http://www.nist.gov/modes>.
82. Masahiko Takenaka, Helger Lipmaa, Naoya Torii. The Implementation of The Block Cipher SC2000 (III). In *ISEC Technical group meeting*, Tohoku University, Sendai, Japan, 18–19 July 2002. In Japanese.
83. Helger Lipmaa. Statistical Zero-Knowledge Arguments: Theory and Practice. In *4th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2004)*, Jyväskylä, Finland, 24–28 July 2004. Invited paper

#### Workshops without Publication

84. Andris Ambainis, Markus Jakobsson, Helger Lipmaa. Cryptographic Randomized Response Techniques. In *DIMACS/PORTIA Workshop on Privacy-Preserving Data Mining*. Rutgers University, Piscataway, NJ, USA, 15–16 March 2004. Program available at <http://dimacs.rutgers.edu/Workshops/Privacy/>
85. Edith Elkind and Helger Lipmaa. How Hard is it to Manipulate Voting?. In *DIMACS Workshop on Electronic Voting*, Rutgers U, NJ, USA, 26–27 May 2004. Program available at <http://dimacs.rutgers.edu/Workshops/Voting/>
86. Edith Elkind and Helger Lipmaa. Hybrid Voting Protocols and Hardness of Manipulation. In *First Spain Italy Netherlands Meeting on Game Theory*, Maastricht, The Netherlands, 24–26 June 2004. Webpage at <http://www.fdewb.unimaas.nl/sing/>
87. Helger Lipmaa. An Oblivious Transfer Protocol with Log-Squared Communication. In *The Past, Present and Future of Oblivious Transfer, Satellite workshop of the Fifth Haifa Workshop on Interdisciplinary Applications of Graph theory, Combinatorics, and Algorithms*, Haifa, Israel, May 17, 2005. Webpage at <http://cri.haifa.ac.il/events/2005/graph/oblivious.htm>.
88. Edith Elkind and Helger Lipmaa. Hybrid Voting Protocols and Hardness of Manipulation. In *1st International Workshop on Computational Social Choice*, Amsterdam, 6–8 December 2006. Webpage at <http://staff.science.uva.nl/~ulle/COMSOC-2006>.
89. Helger Lipmaa and Bingsheng Zhang. A More Efficient Computationally Sound Non-Interactive Zero-Knowledge Shuffle Argument. In *Verifiable Voting Schemes Workshop, from Theory to Practice*, Luxembourg, March 21–22, 2013. Webpage at <http://www.eni.lu/snt/research/apsia/events>

#### Posters

90. Andris Ambainis, Markus Jakobsson, Helger Lipmaa, “Cryptographic Randomized Response Techniques”, Estonian Winter School in Computer Science, Palmse, Estonia, March 3–7 2003.

#### Introductory Articles in Mass Media

91. Helger Lipmaa, “Turvalised virtuaalsed privaativõrgud,” *Arvutimaailm* 2/97, pp 6–7 [“Virtual Private Networks”, a survey in Estonian.], 1997
92. Ahto Buldas, Helger Lipmaa, “Ajatemplid digitaaldokumentidel”, *Arvutimaailm* 2/98, pp 45–47 [“Time-stamps on the digital documents”, a technical survey in Estonian.]

## Public Surveys, Preprints and Technical Reports (not complete)

93. Ahto Buldas, Peeter Laud, Helger Lipmaa, Jan Villemson, "Ajatempli protokollid, turvavajadused ja tehnilised nõuded", Technical Report DO-LU-X-22-1297, Küberneetika AS, 1997, 46 pages ["Timestamp protocols, security needs and technical requirements". Written by the order of Estonian Informatics Center for the work of committee preparing the legal use of electronic documents. In Estonian.]
94. Ahto Buldas, Helger Lipmaa, "Digital Signatures, Timestamps and the corresponding Infrastructure", Küberneetika AS, Technical Report 1998-21, Jan 1998, 7 pages
95. Ahto Buldas, Peeter Laud, Helger Lipmaa, Jan Villemson. Ajatemplisüsteemide teoreetilised alused. Küberneetika AS, Infotehnoloogia osakond, DO-AR-X-14-0698, 1998
96. Ahto Buldas, Peeter Laud, Alar Leibak, Helger Lipmaa, Jan Villemson, Krüptograafiliste protokollide formaalne turvaanalüüs. Küberneetika AS, Infotehnoloogia osakond, DO-AR-T-28-1298, 1998
97. Helger Lipmaa, "AES Candidates: A Survey of Implementations", Technical Report. Available from the list of submissions to the AES2 conference NIST Webpage, 8 pages, 1999.
98. Helger Lipmaa, "Security in On-Line Governance". Survey prepared under UNESCO project "Developing Telematics and Information Networks for On-Line Governance", June 1999.
99. Ahto Buldas, Helger Lipmaa, Meelis Roos, Jan Villemson. Turvalised ja efektiivsed ajatemplisüsteemid. Küberneetika AS, Infotehnoloogia osakond, DO-LU-T-30-1299, 1999
100. Helger Lipmaa, "Digital Signatures and Authentication", June 1999. Updated version of a module in "Security in On-Line Governance". Available from <http://www.cyber.ee/research/publications/auth/>
101. Ahto Buldas, Helger Lipmaa, Jan Villemson. Avaliku võtme sertifikaatide haldus, kasutades vaidlustamatuid kehtivustõendeid. Küberneetika AS, Infotehnoloogia osakond, DO-AR-S-04-0500, 2000.
102. Helger Lipmaa, Oleg Mürk, 'E-valimiste realiseerimisvõimaluste analüüs', 33 pp, April 2001. In Estonian. ["An analysis of the possibility to organise e-voting". Analysis ordered by Estonian Department of Justice. Available from the governmental webpage of E-Voting, <http://www.riik.ee/evalimised/>]

## Presentations

### Invited Talks at Conferences/Workshops

1. How hard is it to manipulate voting? Invited talk at the VOTEID 2009 workshop, 08.09.2009, Luxembourg.
2. Critical look at Estonian E-voting protocol. Invited talk at the Swiss E-Voting Workshop 2010, 06.09.2010, Fribourg, Switzerland.
3. Almost Optimal Short Adaptive Non-Interactive Zero Knowledge. Invited talk at CECC 2014, Budapest, Hungary.
4. A Shuffle Argument Secure in the Generic Model. Invited talk at CIE 2017, Turku, Finland.

### Tutorials at conferences

1. Cryptographic techniques in privacy-preserving data-mining. In ECML/PKDD 2006, 18-22.09.2006, Berlin, Germany.
2. Cryptographic techniques in privacy-preserving data-mining. In Inscrypt 2006, 29.11-01.12.2006, Beijing, China.

### Paper Presentations at Conferences

1. SAC 1998 (Kingston, Canada, 1998)
2. PKC 2000 (Melbourne, Australia, 2000)
3. ACM CCS 2000 (Athens, Greece, 2000)
4. FSE 2001 (Yokohama, Japan, 2001)
5. FC 2002 (Bermuda, 2002)

6. ISC 2002 (São Paulo, 2002, presented two papers)
7. INDOCRYPT 2002 (Hyderabad, 2002)
8. ASIACRYPT 2003 (Taipei, Taiwan, 2003, presented two papers)
9. FC 2004 (Key West, FL, USA, 2004)
10. PKC 2004 (Singapore, 2004)
11. ICALP 2005 (Lisbao, Portugal, 2005)
12. ISC 2005 (Singapore, 2005)
13. ACNS 2007 (Zhuhai, China, 2007)
14. ISC 2008 (Taipei, Taiwan, 2008)
15. CANS 2008 (Hong Kong, China, 2008)
16. ISAAC 2008 (Gold Coast, Australia, 2008)
17. Esorics 2010 (Athens, Greece, 2010)
18. Inscrypt 2010 (Shanghai, China, 2010)
19. FC 2012 (Bonaire, 2012)
20. TCC 2012 (Taormina, Italy, 2012)
21. ACNS 2012 (Singapore, 2012)
22. SCN 2012 (Amalfi, Italy, 2012)
23. FC 2013 (Okinawa, Japan, 2013)
24. ASIACRYPT 2013 (Bangalore, India, 2013)
25. FC 2014 (Barbados, 2014)
26. SCN 2014 (Amalfi, Italy, 2014)
27. CANS 2015 (Marrakech, Morocco, 2015)
28. AFRICACRYPT 2016 (Fez, Morocco, 2016)
29. FC 2017 (Malta, 2017, presented two papers)

#### Other Invited Presentations

1. “Virtual Private Networks”, The Second Annual Information Security Training Seminar of the Institute of Cybernetics, Tallinn, 1996.
2. “IP-level encryption,” The Third Annual Information Security Training Seminar, Tallinn, 1997, Küberneetika AS Technical Report DO-ÜV-T-20-1297, 16 pages
3. “Quantum algorithms,” Estonian Autumn School of Young Physicists, 04.10.98-06.10.98.
4. “Fast cryptographic algorithms on multimedia processors”, The Autumn Seminar of the Institute of Cybernetics, 1998.
5. “Formal security analysis of cryptographic protocols”, The Autumn Seminar of the Institute of Cybernetics, 1998.
6. “Quantum algorithms,” Seminars on quantum mechanics 1998.
7. “Three-Move Identification Schemes”, Cybernetica Seminars, May 23 1999, slides 36 pages
8. “Optimally Efficient Accountable Time-Stamping”, The Autumn Seminar of the Institute of Cybernetics, 1999.
9. Ahto Buldas, Helger Lipmaa, “Cryptographic methods and the security of e-commerce”, E-commerce seminar of Estonian Chamber of Commerce and Industry, 27.10.1999.
10. “Fast Implementations of AES Candidates”, Queensland University of Technology, Brisbane, Australia, 24.01.2000.
11. “Secure and Efficient Time-Stamping Systems”, University of Wollongong, Wollongong, Australia, 25.01.2000.
12. “Secure and Efficient Time-Stamping Systems”, Helsinki University of Technology, Helsinki, Finland, 07.03.2000.
13. “Secure and Efficient Time-Stamping Systems”, University of Latvia, Riga, Latvia, 17.03.2000.
14. “Cryptography: from theory to practice”, assembly of Estonian Mathematical Society, 25.03.2000.
15. “Accountable Certificate Management”, Helsinki University, Helsinki, Finland, 26.09.2000.
16. “Efficient Algorithms for Differential Probability of Addition modulo  $2^n$  and Related Problems”, Helsinki University of Technology, Laboratory of Theoretical Computer Science, 14.12.2000.
17. “On Accountable Time-Stamping and Certificate Management”, NTT Laboratories, Japan, 05.04.2001.

18. “Secure Vickrey Auctions without Threshold Trust”, Estonian Theory Day, Roosta, Estonia, 16-17.10.2002.
19. “On Diophantine Complexity and Statistical Zero-Knowledge Arguments”, Estonian Theory Day, Pedase, Estonia, 03-05.10.2003.
20. “Interleaving Cryptography and Mechanism Design: The Case of Online Auctions”, Estonian Theory Day, Koke, Estonia, 30.01-01.02.2004.
21. “An Oblivious Transfer Protocol with Log-Squared Communication”, Estonian Theory Day, Veskisilla, Estonia, 1-3.10.2004.
22. Invited for a research visit to Singapore, 16-31 Jan 2005. One talk: “An Oblivious Transfer Protocol with Log-Squared Communication”, 25.01.2005.
23. “Designated Verifier Signatures: Attacks, New Security Notions And A Construction”, Estonian Theory Day, Koke, Estonia, 04-06.02.2005.
24. “An Oblivious Transfer Protocol with Log-Squared Communication”, University of Indiana at Bloomington, 14.02.2005.
25. “Designated Verifier Signatures: Attacks, New Security Notions And A Construction”, National University of Singapore, Singapore, 26.09.2005.
26. “On delegatability of four designated verifier signatures”, Estonian Theory Day, Viinistu, Estonia, 28.10.2005.
27. “An Oblivious Transfer Protocol with Log-Squared Communication”, Xiamen University, China, 17.12.2005.
28. “Designated Verifier Signatures: Attacks, New Security Notions And A Construction”, University College London, UK, 23.02.2006.
29. “Succinct NP Proofs from An Extractable-Algorithm Assumption”, Estonian Theory Days, Voore, Estonia, 01.10.2006.
30. Cryptographic techniques in privacy-preserving data-mining (tutorial). In University of Bristol, UK, 22.01.2007.
31. Cryptographic techniques in privacy-preserving data-mining (tutorial). In Estonian Theory Days, UK, 28.01.2007.
32. Research visit, Chinese University of Hong Kong, March 2007 (2 weeks). Talks:
  - Cryptographic techniques in privacy-preserving data-mining (tutorial).
33. “Hybrid Damgård is CCA1-Secure”, Estonian Theory Days, Estonia, 30.9.2007.
34. On Some Open Problems in Communication-Efficient Cryptocomputing, Royal Holloway, University of London, UK, 20.03.2008.
35. Research visit, Tsinghua University, China, May 12–31, 2008. Talks:
  - Private Branching Programs: On Communication-Efficient Cryptocomputing. Tsinghua, Beijing, China, 21.05.2008.
36. “Private branching programs: on communication-efficient cryptocomputing”, Estonian Theory Days, Jõulumäe, Estonia, 03.10.2008.
37. Research visit, Macquarie University, Australia, Dec 18–22, 2008. Talks:
  - Private Branching Programs: On Communication-Efficient Cryptocomputing. Macquarie University, Sydney, Australia, 19.12.2008.
38. Research visit, National Technical University, Singapore, Jan 11–30, 2009. Talks:
  - Private Branching Programs: On Communication-Efficient Cryptocomputing. NTU, Singapore, 16.01.2009.
39. Additive combinatorics and discrete logarithm based range protocols. Estonian Theory Days, Mäetaguse, Estonia, 04.10.2008.
40. Multi-Query Computationally-Private Information Retrieval with Constant Communication Rate. Estonian Theory Days, Elva, Estonia, 13.06.2010.
41. On Norwegian Internet Voting Protocols. Joint Estonian-Latvian Theory Days, Rakari, Latvia, ???.10.2010.
42. Progression-Free Sets and Sublinear Pairing-Based Non-Interactive Zero-Knowledge Arguments. Estonian Theory Days, Nelijärve, Estonia 04.02.2011.
43. On Norwegian Internet Voting. Crypto/Security Reading Group, Tartu, Estonia. 20.04.2011.
44. Two presentations (on Estonian E-voting and Norwegian E-Voting), Dagstuhl seminar 11281 (Verifiable Elections and the Public), 10-15.07.2011.



45. A more efficient computationally sound non-interactive zero-knowledge shuffle argument. Estonian Theory Days, Tõrve, Estonia, 07.10.2011.
46. Progression-Free Sets and Sublinear Pairing-Based Non-Interactive Zero-Knowledge Arguments. Estonian Theory Days, Kubija, Estonia, 28.01.2012.
47. Progression-Free Sets and Sublinear Pairing-Based Non-Interactive Zero-Knowledge Arguments. Crypto reading group, University of Tartu, Estonia, 17.05.2012.
48. On Lattice-Based Cryptography. Crypto Day, University of Latvia, Riga, Latvia, 30.05.2012.
49. New Non-Interactive Zero-Knowledge Subset Sum, Decision Knapsack And Range Arguments. Joint Estonian-Latvian Theory Days, Medzabaki, Latvia, 29.09.2012.
50. Succinct Non-Interactive Zero Knowledge Arguments from Span Programs and Linear Error-Correcting Codes. In TCS seminar, University of Tartu, 14.03.2013.
51. A more efficient computationally sound non-interactive zero-knowledge shuffle argument. In “Verifiable and Secure Voting Workshop”, Luxembourg, March 2013.
52. Succinct Non-Interactive Zero Knowledge Arguments from Span Programs and Linear Error-Correcting Codes. In “Quantum and Crypto Day”, University of Latvia, 25.04.2013.
53. Succinct Non-Interactive Zero Knowledge Arguments from Span Programs and Linear Error-Correcting Codes. In workshop “Algebra and Its Applications”, Piusa, Estonia, 26.04.2013.
54. Succinct Non-Interactive Zero Knowledge Arguments from Span Programs and Linear Error-Correcting Codes. In Finnish-Estonian Mathematics Days 2014 (Helsinki, Finland, 9-10.01.2014)
55. Almost Optimal Short Adaptive Non-Interactive Zero-Knowledge. CECC 2014 (Budapest, Hungary, May, 2014)
56. Efficient NIZK Argument for NP. In Joint Estonian-Joint Estonian-Latvian Theory Days, Ratnieki, Latvia, 04.10.2012
57. On More Efficient Computationally Sound Non-Interactive Zero-Knowledge Shuffle Arguments. Aalto University, Helsinki, Finland, 10.10.2014
58. Prover-Efficient Adaptive Zero-Knowledge SNARKs. University of Turku, Finland, 01.04.2015
59. Optimal Rate Private Information Retrieval from Homomorphic Encryption. Estonian Theory Days, Jõeküla, Estonia, 02.10.2015.
60. Optimal Rate Private Information Retrieval from Homomorphic Encryption. Invited talk at FIT 2016 (Yearly Polish meeting of Theoretical Computer Science), Warsaw, Poland.
61. Cryptographically Secure Mix-Nets. Summer School "Summer Research Institute 2016", EPFL, Lausanne, Switzerland, 21.06.2016.
62. Non-interactive Zero-Knowledge Proofs and Applications. 6th Crypto.Sec Day, Athens, Greece, 18.07.2016.
63. A Shuffle Argument Secure in the Generic Model. Estonian-Latvian Theory Days, Lilaste, Latvia, 14.10.2016.
64. ZK-SNARKs: Foundations and Applications. Summer school “Number theory and coding theory: Contemporary applications in security”, Turku, Finland, 01.06.2018.
65. On QA-NIZK in the BPK Model. Estonian-Latvian Theory Days, Riga, Latvia, 13.10.2018.
66. On QA-NIZK in the BPK Model. Simula UiB, Norway, 19.10.2018.
67. ZK-SNARKs: Foundations and Applications. Simula UiB, Bergen, Norway, 11.10.2019.
68. ZK-SNARKs: Foundations and Applications. Estonian-Latvian Joint Theory Days, Pärnu, Estonia, 11.10.2019.

### Rump Session Presentations

1. “Efficient Algorithms for Differential Probability modulo  $2^n$  and Related Problems” (Eurocrypt 2000, joint work with Shiho Moriai)
2. “On Optimal Hash Tree Traversal” (EWSCS 2001)
3. “On Additive Differential Probability of Exclusive Or” (Eurocrypt 2003, joint work with Johan Wallén, presented by Johan)
4. “How Hard is it to Manipulate Voting?” (FC 2004, joint work with Edith Elkind, presented by Edith)

## **Other Presentations**

1. Several presentations at the Estonian Winter School in Computer Science, 1998–1999.

## **Panelist**

1. “E-Voting: Challenge to the Society”, Tallinn, Estonia, 19.06.2003.
2. Seminar on e-voting, Tartu, Estonia, 17.05.2004. Panel leader.
3. Swiss Workshop on e-voting, Fribourg, Switzerland, 06.09.2010

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