

**Serik Sagitov**  
Bitr Professor in Mathematical Statistics  
Extended CV 10.11.2010

Mathematical Sciences  
Chalmers University of Technology and  
University of Gothenburg

## Part 1. Curriculum Vitae

Born August 14, 1956 in Semipalatinsk, Kazakhstan  
Swedish citizen  
Personal webpage: <http://www.math.chalmers.se/~serik/>  
Current position

Biträdande Professor in Mathematical Statistics,  
Department of Mathematics  
Chalmers University of Technology  
S-41296 Göteborg, Sweden

Father of two sons and a daughter

Astan Sagitov (30 years old) leading risk manager at the Alpha-bank, Almaty Kazakstan  
Rauan Sagit (25 years old) PhD student at the Stockholm Bioinformatics Center  
Elin Sagitov (2 years old)

## Job Experience

2009 – present: Biträdande Professor in Mathematical Statistics, Department of Mathematics, Chalmers University of Technology and University of Gothenburg

2007 - present: Director of Undergraduate Studies in Mathematical Statistics, Department of Mathematics, Chalmers University of Technology and University of Gothenburg

1999 - 2009: Associate Professor in Mathematical Statistics, Department of Mathematics, Chalmers University of Technology and University of Gothenburg

1997 - 1999: Guest researcher and lecturer at the Department of mathematics, Chalmers University of Technology and University of Gothenburg

1997 spring: Consultant in restructuring at the trade company "BUTYA" (Almaty, Kazakhstan)

1995-1997: Part-time lecturer at the Kazak Institute of Economics and Management (Almaty, Kazakhstan)

1984-1997: Researcher at the Institute of Theoretical and Applied Mathematics, National Academy of Kazakhstan (Almaty, Kazakhstan)

1992 autumn: Guest researcher at the Department of mathematics, Chalmers University of Technology and University of Gothenburg

1991 autumn: Guest researcher at the Department of mathematics, Chalmers University of Technology and University of Gothenburg

1987 whole year: Guest researcher at the Steklov Institute of Mathematics (Moscow, Russia)

1985-1986, 1988: Part-time lecturer in Probability and Mathematical Statistics at the Kazak State University (Almaty, Kazakhstan)

## **Education and academic degrees**

2007- 2008: Successfully completed the pedagogical program Diploma of Higher Education at Chalmers

1998: "Docent in Mathematical Statistics" academic degree at the Chalmers University of Technology

1995-1997: Intensive courses on Business Valuation, Real Estate Appraisal, Machinery and Equipment Appraisal, Turn Around Management, Project Appraisal, Entrepreneurship (Irkutsk, St. Petersburg, Russia; Birmingham University, UK; Babson College, USA; Almaty, Kazakstan)

1991: Persidskij's award for Young Mathematician, National Academy of Kazakstan

1990: "Senior Researcher" academic degree in Probability and Mathematical Statistics at the Soviet Academy of Sciences

1978-1983: Ph.D. student in Probability and Mathematical Statistics at the Steklov Institute of Mathematics (Moscow, Russia)

1973-1978: Master degree student in Probability at the Moscow State University, Department of Mechanics and Mathematics (Moscow, Russia)

1971-1973: Student at the RFMSh, secondary school with special emphasis on Mathematics and Physics (Almaty, Kazakstan)

## **Scientific grants**

2011-2013. The VR grant for the project " Stochastic models for gene and species trees" (project leader S.Sagitov)

2009-2010. Two travel grants from VR

2007-2010. The Bank of Sweden Tercentenary Foundation project "What is the Effective Size of a Varying Population in Long Range Balance" (project leader S.Sagitov)

2003-2005. The Bank of Sweden Tercentenary Foundation project "The History of Stochastic Population Processes" (project leader P.Jagers)

1997-1999. The Bank of Sweden Tercentenary Foundation project "Branching processes with dependencies" (project leader P.Jagers)

1993-1995. Soros Scientific Foundation project "Limit theorems in probability theory" (project leader V.Vatutin)

## Languages

Russian, English, Swedish (fluent), Kazak (good), French (reading).

## Part 2. Complete list of papers

58. Sagitov S., Jagers P., Mehlig B., and Vatutin V. Triggering lines for adaptive sympatric speciations (in preparation)
57. Sagitov S. and Serra M.C. Skeletons of nearly-critical branching processes (in preparation)
56. Sagitov S., Mehlig B., Rafajlovic M, and Eriksson A. Coalescent algorithms for populations with skewed reproduction, recurrent bottlenecks and selective sweeps (in preparation)
55. Klebaner F., Sagitov S., Vatutin V., Haccou P., Jagers P. Stochasticity in the adaptive dynamics of evolution: the bare bones. *J. Biol. Dynamics* 4 (2010) (to appear)
54. Eriksson A., Mehlig B., Rafajlovic M, and Sagitov S. The total branch length of sample genealogies in populations of variable size. *Genetics* 186 (2010) 601-611
53. Jagers P. and Sagitov S. Limit theorems for branching processes. In: *Encyclopedia of Operations Research and Management Science*, Wiley 2010
52. Sagitov S., Jagers P. and Vatutin V. Coalescent approximation for structured populations in a stationary random environment. *Theor. Popul. Biol.* 78 (2010) 192-199
51. Sagitov S. and Serra M.C. Multitype Bienayme-Galton-Watson processes escaping extinction. *Adv. Appl. Prob.* 41 (2009) 225-246
50. Jagers P. and Sagitov S. General branching processes in discrete time as random trees. *Bernoulli* 14 (2008) 949-962

49. Lagerås A. and Sagitov S. Reduced branching processes with very heavy tails. *J. Appl. Prob.* 45 (2008), 190-200
48. Eriksson A., Fernström P., Mehlig B. and Sagitov S. An accurate model for genetic hitchhiking. *Genetics* 178 (2008) 439-451.
47. Klebaner F., Rösler U. and Sagitov S. Transformations of Galton--Watson processes and linear fractional reproduction. *Adv. Appl. Prob.* 39 (2007), 1036-1053
46. Jagers P. and Klebaner F. and Sagitov S. Markovian Paths to Extinction. *Adv. Appl. Prob.* 39 (2007), 569-587.
45. Jagers P. and Klebaner F. and Sagitov S. On the Path to Extinction. *PNAS* 104 (2007), 6107--6111.
44. Klebaner F. and Sagitov S. Reversed Galton-Watson processes in the linear fractional case. Chalmers University of Technology, Math. Dept., Preprint no. 5 (2005)
43. Sagitov S. and Jagers P. The coalescent effective size of age-structured populations. *Ann. Appl. Probab.* 15 (2005), 1778-1797
42. Jagers P. and Sagitov S. Coalescent processes: reversed branching. In *Branching processes: Variation, growth, extinction*, by Haccou P., Jagers P. and Vatutin V., Cambridge U. Press (2004)
41. Jagers P. and Sagitov S. Convergence to the coalescent in populations of substantially varying size. *J. Appl. Prob.* 41 (2004), no. 2, 368-378.
40. Sagitov S. Convergence to the coalescent with simultaneous multiple mergers. *J. Appl. Prob.* 40 (2003), 839-854
39. Möhle M. and Sagitov S. Coalescent patterns in exchangeable diploid population models. *J. Math. Biol.* 47 (2003) 337-352.
38. Sagitov S. Coexistence of two polygynous mating strategies. Chalmers University of Technology, Math. Dept., Preprint no. 95 (2002)
37. Klebaner F. and Sagitov S. The age of a Galton-Watson population with geometric offspring distribution. *J. Appl. Prob.* 39 (2002), 1-13.
36. Möhle M. and Sagitov S. A classification of coalescent processes for haploid exchangeable population models. *Ann. Prob.* 29 (2001) 1547-1562.
35. Jagers P. and Sagitov S. The growth of general population-size-dependent branching processes year by year. *J. Appl. Prob.* 37 (2000), No.1, p. 1-14.

34. Sagitov S. The general coalescent with asynchronous mergers of ancestral lines. *J. Appl. Prob.* 36 (1999), 1116-1125.
33. Möhle M. and Sagitov S. A classification of ancestral limit processes arising in haploid population genetics models. *Berichte zur Stochastik und verwandten Gebieten*, Johannes Gutenberg-Universität Mainz, November 1998, issn 0177-0098.
32. Sagitov S. Linear growth in the multitype Galton-Watson process with density-dependent reproduction. Chalmers University of Technology, Math. Dept., Preprint no. 30 (1998), 24 pp.
31. Kaj, I. and Sagitov S. Limit processes for age-dependent branching particle systems. *J. Theor. Prob.* 11 (1998) 225-257.
30. Kaj, I. and Sagitov S. Superprocess approximation for a spatially homogeneous branching walk. *Electron. Comm. Probab.* (1997), 59-70 (electronic).
29. Sagitov S. Limit skeleton for critical Crump-Mode-Jagers branching processes. *Classical and modern branching processes* (Minneapolis, MN, 1994), 295--303, IMA Vol. Math. Appl., 84, Springer, New York, 1997.
28. Sagitov S. Introduction to financial mathematics. (In Russian) Preprint of the Institute of Theoretical and Applied Mathematics, National Academy of Sciences of Kazakstan, Almaty (1996). Pages 1-19, 20-39, 40-52.
27. Sagitov S. On a nonregular branching process. *Theory Probab. Appl.* 40 (1995), no. 3, 575--577.
26. Sagitov S. A key limit theorem for critical branching processes. *Stochastic Process. Appl.* 56 (1995), no. 1, 87--100.
25. Sagitov S. Three limit theorems for reduced critical branching processes. *Russian Math. Surveys*, 50 (1995), no. 5, 1025--1043.
24. Sagitov S. On the renewal theory in triangle array. Uppsala University, Math. Dept., Preprint no. 15 (1994), 7 pp.
23. Sagitov S. Measure-branching renewal processes. *Stochastic Process. Appl.* 52 (1994), no. 2, 293--307.
22. Sagitov S. General branching processes: convergence to Jirina processes. Stability problems for stochastic models (Kirillov, 1989). *J. Math. Sci.* 69 (1994), no.4, 1199-1206.

21. Sagitov S. A general critical branching process with regularly varying survival probability. Chalmers University of Technology, Math. Dept., Preprint no. 17 (1993), 15 pp.
20. Sagitov S. Convergence of critical chi-counted branching processes to a continuous-state branching process. Chalmers University of Technology, Math. Dept., Preprint no. 39 (1992), 34 pp.
19. Sagitov S. A Bellman-Harris branching process that starts with a large number of particles. Soviet Math. Dokl. 42 (1991), no. 2, 372-375.
18. Sagitov S. and Vatutin, V.A. A critical branching process: the remote past given a favorable present. Theory Probab. Appl (1991), no. 1, 86-98.
17. Sagitov S. A multidimensional critical branching process generated by a large number of particles of a single type. Theory Probab. Appl. 35 (1990), no.1, 118-130.
16. Sagitov S. Limit behavior of reduced critical branching processes. Soviet Math. Dokl. 38 (1989), no. 3, 488-491.
15. Sagitov S. and Vatutin V.A. A decomposable critical Bellman-Harris branching process with two types of particles. II. Theory Probab. 34 (1989), no. 2, 216-227.
14. Sagitov S. and Vatutin V.A. A decomposable critical Bellman-Harris branching process with two types of particles. I. Theory Probab. 33 (1988), no. 3, 460-472.
13. Sagitov S. and Vatutin V.A. Critical decomposable Bellman-Harris processes with two types of particles, which are "far from" Markov processes. Math. Notes 43(1988), no. 1-2, 157-161.
12. Sagitov S. Multidimensional limit theorems for a branching process with one type of particles. (Russian) Mat. Zametki 42 (1987), no. 1, 157-165.
11. Sagitov S. Total progeny of a critical branching process. Proceedings of the 1st World congress of the Bernoulli society, Vol. 2 (Tashkent, 1986), 713-715, VNU Sci. Press, Utrecht, 1987.
10. Sagitov S. and Vatutin V.A. A decomposable critical branching process with two types of particles. (Russian) Probabilistic problems of discrete mathematics. Trudy Mat. Inst. Steklov. 177 (1986), 3-20.
9. Sagitov S. and Vatutin V.A. A decomposable critical Bellman-Harris branching process with two types of particles. (Russian) Dokl. Akad. Nauk SSSR 291(1986), no. 5, 1040-1043.

8. Sagitov S. Limit behavior of general branching processes. (Russian) *Mat. Zametki* 39 (1986), no. 1, 144-155.
7. Sagitov S. A reduced critical Bellman-Harris branching process with several types of particles. (Russian) *Teor. Veroyatnost. i Primen.* 30 (1985), no. 4, 737-749.
6. Sagitov S. Limit theorems for critical branching processes. (Russian) Ph. D. thesis manuscript, Moscow, Steklov Math. Institute (1983), 96 pp.
5. Sagitov S. Limit theorem for a critical branching process of general type. (Russian) *Mat. Zametki* 34 (1983), no. 3, 453-461.
4. Sagitov S. Limit theorems for multidimensional critical branching processes with immigration. (Russian) *Dokl. Akad. Nauk SSSR* 271(1983), no. 5, 1066-1069.
3. Sagitov S. Common ancestors in critical Bellman-Harris branching processes with several types of particles. (Russian) *Izv. Akad. Nauk Kazakh. SSR Ser. Fiz.-Mat.* (1982), no. 3, 66-69.
2. Sagitov S. Critical branching processes with several types of particles and with immigration. (Russian) *Teor. Veroyatnost. i Primen.* 27 (1982), no. 2, 348-353.
1. Sagitov S. Zero-hitting probability for a critical branching process with immigration. (Russian) *Izv. Akad. Nauk Kazakh. SSR Ser. Fiz.-Mat.* (1982), no. 5, 63-65.

## Part 3. A summary of my research, supervision of students' research and other achievements

### Short summary of my research

My research has been devoted to various asymptotic questions concerning such population models as Branching Processes and Exchangeable Reproduction Models. The latter describe fixed size populations and the focus lies in characterizing genetic variation patterns in particular in terms of the corresponding genealogical tree. Here I succeeded (JAP 1999) to find a new class of coalescent approximations (independently of J.Pitman) known as lambda-coalescent processes, which recently became a very popular object of research among experts in population genetics and random partitions (see for example our recent paper in *Genetics* 2008). Then together with M.Möhle (*Annals of Probability* 2001) we extended this result towards the coalescent with simultaneous multiple mergers (which was fully characterized afterwards by J.Schweinsberg). Natural convergence conditions to the coalescent with simultaneous multiple mergers were established in terms of ordered offspring numbers within a generation (JAP 2003).

Jointly with P.Jagers we have established convergence to Kingman's coalescent for populations with randomly varying sizes and age-structured populations. The latter result produced a new formula for the effective population size which was mentioned in the new edition of the standard text book in population genetics by Hartl and Clark. Recently, another interesting development in this direction was achieved (joint work with P.Jagers and V.Vatutin) taking into account the fluctuations in genetic drift caused by randomness in the environment.

In the theory of Branching Processes I have addressed the following aspects

- Reduced branching processes
- Measure-valued branching
- Heavy-tailed life length
- Infinite variance of offspring numbers
- Decomposable multi-type processes
- Size-biased reproduction and spinal representation
- Time-reversed branching
- Extinction times for subcritical processes starting from many individuals
- Continuous state branching processes
- Summation of random characteristics for the critical CMJ processes
- Time to escape extinction through a sequence of mutations
- Age of the branching process
- Population size dependent reproduction
- Explosion of branching processes (non-regularity)

Currently we are working (together with P.Jagers, F.Klebaner, and V.Vatutin) on models of sympatric speciation based on interactive branching processes.

## Supervision of students

1985-1986, 1988

Supervision of Bachelor and Master degree (**Erahmet Zhumaev**) projects on Markov chains and Multi-type Branching Processes at the Department of Mathematics, Kazak State University (Almaty, Kazakhstan).

Supervision of a school project on Elementary Probability Theory for a student at RFMSh, secondary school with special emphasis on Mathematics and Physics (Almaty, Kazakhstan).

1987-1991

Supervisor and co-advisor of three PhD students at the Institute of Theoretical and Applied Mathematics, National Academy of Kazakhstan (Almaty, Kazakhstan):

- **Altai Almukambetov** "Local limit theorems for critical branching processes with immigration" (main supervisor V.Vatutin),
- **Erahmet Zhumaev** "Near critical age-dependent Branching Processes",
- **Galim Sadibekov** "Reduced two-type decomposable Branching Processes".

Unfortunately, none of these student have finished their PhD theses because of the economic crisis of the academic system in Kazakhstan connected to the collapse of the Soviet Union.

1997-present

At the Chalmers University of Technology and University of Gothenburg I have been involved in the following student projects.

Bachelor degree students:

- Coadviser and examiner for **Erik Hjalmarsson** (1999) Nord Pool: a Power Market without Market Power
- **Freyr Hermannsson** (2005) On the construction of standard and super Brownian Motion

Master degree students:

- Coadviser and examiner for **Henrik Nilsson** (2001) A primer to the Phylogeny of the Hyphoderna Setigerum Complex
- Examiner for **Niklas Norén** (2002) A Monte Carlo method for Bayesian dependency derivation
- Adviser and examiner for **Cindy Liu** (2003) Age-structured coalescent
- Coadviser for **Tang Jing** (2004) Beta coalescent
- Adviser for **Liu Xiamo** (2005) Selective sweep patterns of genetic variation
- Examiner for **Shruti Rastogi** (2005) Evolution in Model Proteins
- Adviser and examiner for **Emilio Bergroth** (2007) A Critical Branching Process Model for Biodiversity

- Visiting student (mentor) for **Alexis Huet** (summer 2008) On xlogx condition for supercritical branching processes.
- Master degree thesis (examiner) for **Zheng Cui** (2009) Nemertea group and the DNA barcoding theory.

#### PhD students:

- Co-adviser for **Ali Falahati** (defended 1999) Two-Sex Branching Populations (main adviser P.Jagers)
- Main adviser for **Maria Conceicao Serra** (defended 2007) Branching processes escaping extinction (co-adviser and examiner P.Jagers)
- Guest PhD student **Cristina Gutiérrez Pérez** (autumn 2008).
- PhD thesis (co-adviser). **Krzysztof Bartoszek** (2009-) Analysis of OUCH and SLOUCH models (main adviser P.Mostad)

#### Postdocs:

- **Andreas Lagerås** (2007-2008)
- **Maria Conceicao Serra** (6 months during 2009-2010)

## Miscellaneous

#### PhD committees

- 2002 February. Opponent to the licentiate degree defense by Raimundas Gaigalas at the Uppsala University.
- 2004 February. A member of the PhD defense committee for Raimundas Gaigalas "A non-Gaussian limit process with long-range dependence" at the Uppsala University.
- 2007 January. A member of the PhD defense committee for Magnus Karlsson "Load modeling for fatigue assessment of vehicles – a statistical approach" at Mathematical Sciences, Chalmers.
- 2007 June. A member of the PhD defense committee for Louise Holm "A non-stationary perspective on the European and Swedish business cycle" at the Handels Högskola, GU.

#### Referee duties

- I have reviewed papers for the following journals: Journal of Applied probability, Advances in Applied probability, Annals of Probability, Annals of Applied Probability, Stochastic Processes and their Applications, Journal of Mathematical Biology, Journal of Theoretical Biology.
- I also reviewed some book projects, in particular for Springer.

#### Conference organization

- Stochastic Approaches to Evolution, Gothenburg, May 26-30, 2007
- Symposium "In Honour of Peter Jagers", Gothenburg, March 27-28 2008
- 10<sup>th</sup> Vilnius conference, Vilnius, June 28 - July 2, 2010
- IMS-2010 conference in Gothenburg, August 9-13 2010

Journal editor

- Eurasian Journal of Mathematics

## Part 4. Portfolio of Pedagogical Qualifications

### Teaching at undergraduate and graduate levels

1985-1986, 1988

During those three years I was a part-time lecturer at the Department of Mathematics of the Kazak State University (Almaty, Kazakhstan). I taught several undergraduate courses in Probability, Mathematical Statistics and Stochastic Processes for students from different programs: mathematics, physics, mechanics, chemistry. I had both lectures and exercise classes. The group sizes ranged from 30 to 60, the teaching language was Russian.

1992

A study circle on the textbook D.Williams "Probability with Martingales" at the Chalmers University of Technology. During two months time I met weekly with two PhD students from the Division of Mathematical Statistics and explained difficult parts of the book (examiner Peter Jagers).

1995-1997

As a part-time lecturer at the KIMEP (Kazak Institute of Economics and Management), I taught an undergraduate course in Applied Statistics, and repeatedly a Project Appraisal course using the case-study approach. Both courses were part of the program "Master of Public Administration" (director Anu Bose). A typical group size was 30 students.

1997-present

I gave lectures for various statistical courses at Chalmers and University of Gothenburg (GU). Here is a list of the courses (some of them given several times):

- Time series and forecasting (15 students, teaching language English),
- Nonparametric statistical inference (15 students, teaching language English),
- Mathematical statistics for Bioengineers (60 students, teaching language Swedish),
- Basics of mathematical statistics for Bioinformaticians (10-15 students, teaching language English),
- Mathematical statistics for Technical Physicists and Chemistry Physicists (100 students, teaching language Swedish),
- Basic statistics for genomic science (30 students, teaching language English),
- Population genetics (20-25 students, teaching language English),
- Statistical inference (20-50 students, teaching language English),
- Probability Theory 1 (20 students, teaching language Swedish).

2004 February

A PhD course at Zoology Department, GU "Population phylogeny and coalescent methods" (main organizer Per Sundberg). The course was on modern computer intensive methods of phylogenetical tree building. My part was to present to PhD students as well senior researchers with various background (zoology, botany, computer science) the stochastic models and statistical issues behind the Bayesian inference in phylogenetical systematics. The number of participants was around 15.

2005 June

An intensive summer course "Age-dependent Critical Branching Processes" for PhD and advanced Master students at the Beijing Normal University (host Zhenghu Li). The number of participants was around 30.

2008 spring

Two PhD courses on statistical methods in phylogenetics. One as a study circle on the recent book Computational Molecular Evolution by Ziheng Yang. The other is an intensive PhD course "From gene trees to a species tree" scheduled for June 9-13 (main organizer Bengt Oxelman). The course will be devoted to new developments on phylogenetical tree building. My part will be to present to PhD students with biological background the stochastic models and statistical issues behind Bayesian inference in phylogenetical systematics. The number of participants is 15-20.

2008 autumn

A PhD course on Linear-fractional Branching processes at the home department of Mathematical Sciences. In a more intensive format this course was also given at the Gumilev University in Astana, Kazakhstan.

2009 summer

An intensive PhD course on Linear-fractional Branching processes is given at the Ufa State Aviation University in Ufa, Russia.

2010 autumn

Contribute to another course on phylogenetics (December 10-15, main organizer Bengt Oxelman).

## **Pedagogical studies and development projects**

1996 May

Participated in a week long Symposium for Entrepreneurship Educators organized by Babson College (MA, USA). The participants of the Symposium were introduced to the concepts of entrepreneurship and how they are taught with special emphasis on the case-study approach.

2000

Participated in a two-day GU course for PhD advisers. It included lectures, group discussions, and literature reading.

2007 October

Participated in a one-day course for PhD advisers at Chalmers (instructor Frida Lisak).

2007-2008

Successfully completed the pedagogical program Diploma of Higher Education at Chalmers.

## **Teaching activity outside the university**

1978-present

Starting from the presentation of my Master degree thesis I have given a great number of lectures on my research at numerous seminars, conferences, and workshops throughout the world: Russia, Kazakstan, Uzbekistan, Ukraine, Lithuania, Bulgaria, Poland, Sweden, Denmark, France, Germany, Italy, Holland, China, Australia, USA.

1984 autumn

A study circle at the RFMSh, secondary school with special emphasis on Mathematics and Physics (Almaty, Kazakstan). The subject of the study circle was Discrete probability. During two months time I met weekly with a group of around 10 school children and we solved a number of elementary problems in Probability theory.

1995-1997

I was involved in a series of Training programs organized by the Economic Development Institute of the World Bank. First as a participant, then as an interpreter and finally as an instructor. The courses I taught were Real Estate Valuation, Principles of Business Valuation, Machinery and Equipment Appraisal.

These were intensive courses, usually one week, 8 hours a day. The courses took place at different regions in Kazakstan (Almaty, Pavlodar, Semipalatisk). They were aimed at people working at different public and private companies and practicing various kinds of valuation (mainly real estate valuation agencies). A typical group size was 20 participants.

2007 spring

I gave a public lecture at the Vetenskapsfestivalen (in Swedish). It was aimed to provide the community at large with information about my research in the theory of Population Genetics. Number of listeners around 100.

## **Assessment of teaching contributions from the student perspective**

Many of my courses have been evaluated by students. These evaluations helped me to structure my lectures in a clearer way and also to develop my presentation techniques. They also showed an increasing appreciation of my teaching skills. I always try use every opportunity to get a more direct feedback from my students by discussing the course content during the breaks. Following the new Chalmers policy I put on my course pages an online evaluation link. My best reward for such a course is an eventual round of applauds in the end of the course.

Here comes an example of a feedback message from a student who took the Statistical inference course in 2006 (Katarina.Bohman@autoliv.com):

``Hejsan Serik, jag undrar om du har rättat färdigt tentorna i Statistisk slutledning... Avslutningsvis, skulle jag vilja tacka för en trevlig och givande kurs. Jag tycker det var ett bra upplägg att få föreläsningsanteckningar i förhand, så kunde man lätt komplettera med egna anteckningar under föreläsningarna. Dessutom uppskattade jag ditt pedagogiska sätt att undervisa på.  
Det jag tycker man kunde ha gjort annorlunda, hade varit om bonusuppgiften kunde haft ett tidigare inlämningsdatum, så kunde du tagit en kvart vid ngt lektions tillfälle och gått igenom uppgiften. Det hade oxå varit bra med lite utförligare svar på tentorna som ligger på hemsidan."`

Finally, an unusual point. It was very illuminating to get a constant feedback from my son Rauan Sagit who studied Bioengineering and now is about to finish the Master program in Bioinformatics. He gave me a genuine student's perspective at the educational process at Chalmers, which helped me to understand in a better way the difficulties faced by the students taking my own courses.

## **Description of and reflections on my pedagogical activity**

Passing the ever growing amount of gained information from one generation to another is a most important task for our civilization to prosper. The role of a teacher is to facilitate the learning process by students who are motivated to various degrees. As the learning process takes a more significant part of our everyday life, in my opinion it is very important to make this process enjoyable as well as effective. And here the role of the teacher is crucial, especially for an "average" student as compared with top students who can often manage on their own by reading books and watching recorded lectures if available.

While striving to deliver a certain amount of information at an appropriate level during a lecture, the teacher should always keep the student's perspective in mind. The course should be clearly structured when it comes to the time schedule, the reading assignments, the grading rules, the course webpage, and so on. It is important that there is a connection and trust between students and lecturer, so that the students feel safe to ask even "silly" questions during classes.

As I became more confident about the main content of my courses and gained experience in public presentations, I started paying more attention to form and presentation techniques. Examples vividly illustrating key statistical and probabilistic issues are extremely important for a successful course. I now try to explain basic concepts carefully, formulas and parameters involved and leave most of the mathematical proofs for self study. It is most important that the student gets the big picture and the key idea behind a statistical method or a result from the probability theory. It is also most important to recognize a situation when a certain stochastic model is appropriate.

I believe that for a basic course most of the presentation is best done on the blackboard and not with overheads or power point. It gives the right pace for the lecture and a more comfortable format for the students.

## **Production of teaching materials**

In 1996 I wrote a compendium on basics in financial mathematics in Russian as a supplementary teaching material for the courses on Real Estate Valuation, where I was involved as instructor. It was issued as a preprint at the Institute of Theoretical and Applied Mathematics, National Academy of Sciences in Kazakstan.

My main contribution in the production of teaching material at Chalmers was in the form of lecture notes for all the courses I taught. They are easily available via my homepage [www.math.chalmers.se/~serik](http://www.math.chalmers.se/~serik).

It is important for the student to have such notes downloadable from the course page. The lecture notes help in following lectures and making it clear what part of the text book is covered in the course.

In my teaching practice I moved from using the lecture notes as overheads toward writing everything on the blackboard. Experience shows that this way of presentation is more effective, since it provides with a right pace and more possibilities for being connected to the students during a lecture.

For some of the courses I put solutions of the home assignments on the course page, which allowed running the courses on a low budget, as students do the exercises on their own.

## **Administration and leadership of curriculum planning**

2001-2005

Member of the steering committee for the Master programs ``Teknisk matematik" and ``Engineering Mathematics" at Chalmers University of Technology. The committee met regularly (every quarter) to discuss issues concerning the courses of the programs, student performance, enrolling of new students, program budgets and similar matters.

2003-present

Contact person at the Division of Mathematical Statistics for the GU Master degree projects. I help GU students to choose a suitable project and I keep a webpage with current project proposals and past Master degree projects in Mathematical Statistics.

2006-present

Since the autumn of 2006 I was helping the previous Director of Studies during the transition period to the Bologna system. From 1 July 2007 I am the **Director of Undergraduate Studies** in Mathematical Statistics at the Department of Mathematics. My duties include:

- appointing teachers to the undergraduate Mathematical Statistics courses (both GU and Chalmers) in accordance with their preferences and planned teaching load,
- curriculum planning for new courses and revision of existing courses,
- monitoring course budgets,
- recruitment of part-time teachers,
- supporting course catalogues at Chalmers and GU with current information,
- informing students about the programs and courses and students theses,
- many other things.