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Teaching Portfolio

Formal educational training

- Lecturer training program at SDU in 2014
- Engaging students in group work
- Interactive lecturing
- Helping students understand assessments-using rubrics, peer review and exemplars
- How to use interactive boards as part of your teaching
- PhD supervisor training program 2020

Administrative tasks relating to education

Teaching assignment coordinator for Math and Applied Math 2018-2019
Teaching committee in IMADA (2019-now)

Experience of study programmes supervision and examinations

- I have taught the following courses in SDU: Multivariate statistical analysis (5ECTs), Mathematical statistics (10ECTs), Mathematical statistics 2 (5 ECTS), Complex analysis (5 ECTS), Mathematical Perspectives (5 ECTS), Calculus (10 ECTS), Topology and complex analysis (10 ECTS) and Graph theory (5 ECTS).
- I have taught the tutorials of the following course in SDU: Rings and number theory (5 ECTS) and Graph theory (5 ECTS).
- I have supervised many the individual projects and bachelor projects.
- I have supervised multiple master projects in Mathematics, Applied Mathematics and Mathematical economy.
- I am currently supervising one PhD student.
- I have been examiner for all my own courses and often internal censor for Mathematical and Statistical courses in IMADA.

Methods, materials and tools

During my teaching, I have used the following methods

- Flipped classroom
- Using smart-board
- Forum theatre
- Helping students understand assessments - using rubrics, peer review and exemplars
- Online teaching techniques

Reflections on my teaching practice

I believe the main features of my teaching in mathematics and statistics are the following:

- > Audience orientated. Teaching, as a particular type of presentation, is all about audience. Before I prepare a course, I always spend enormous efforts in collecting background information of the students registered in this course. In particular, discussing with my colleagues who have taught these students.
- > Balanced and prioritized teaching objectives. Everyone appears in the lecture, including both the lecturer and the students, has his/her own expectation for this particular lecture. As a lecturer, my objective is that to make my audience indeed learn knowledge during the teaching to his/her largest extent. To this end, it is of the utmost importance to have balanced and prioritized teaching objectives.
- > Hyggelig and active study atmosphere. The more active the study atmosphere is, the more knowledge the students can learn and the happier people in class are. I observe an interesting and inspiring phenomenon that my students remember the mathematical results better when I teach them with an active and "hyggelig" environment.

- Online teaching is challenging, but there are techniques to improve the quality of teaching. For instance, using OneNote as a tool to share notes of teaching and organise online office hours to let student have access to the lecturer.
- For theoretical courses, it is always "a good picture is better than 1000 words", but I admit, finding a good picture to demonstrate a definition or theorem can be very time consuming and maybe even impossible for the moment. But I consider teaching is a skill which can be improved as long as one teaches. I am still på min vej.

Research outputs

Conditional marginal expected shortfall

Goegebeur, Y., Guillou, A., Le Ho, N. K. & Qin, J., 6. May 2021, (E-pub ahead of print) In: *Extremes*.

Extreme value estimation of the conditional risk premium in reinsurance

Goegebeur, Y., Guillou, A. & Qin, J., Jan 2021, In: *Insurance: Mathematics and Economics*. 96, p. 68-80

Robust nonparametric estimation of the conditional tail dependence coefficient

Goegebeur, Y., Guillou, A., Ho, N. K. L. & Qin, J., Jul 2020, In: *Journal of Multivariate Analysis*. 178, 20 p., 104607.

Bias-corrected estimation for conditional Pareto-type distributions with random right censoring

Goegebeur, Y., Qin, J. & Guillou, A., 15. Sep 2019, In: *Extremes*. 22, 3, p. 459-498

Robust estimation of the Pickands dependence function under random right censoring

Goegebeur, Y., Guillou, A. & Qin, J., 1. Jul 2019, In: *Insurance: Mathematics and Economics*. 87, p. 101-114

On kernel estimation of the second order rate parameter in multivariate extreme value statistics

Goegebeur, Y., Guillou, A. & Qin, J., 2017, In: *Statistics & Probability Letters*. 128, p. 35-43

A Consensus Network of Gene Regulatory Factors in the Human Frontal Lobe

Berto, S., Perdomo-Sabogal, A., Gerighausen, D., Qin, J. & Nowick, K., 2016, In: *Frontiers in Genetics*. 7, p. 1-16 37.

Pseudoknots in RNA folding landscapes

Kucharik, M., Hofacker, I. L., Stadler, P. & Qin, J., 2016, In: *Bioinformatics*. 32, 2, p. 187-194

Graph-distance distribution of the Boltzmann ensemble of RNA secondary structures

Qin, J., Fricke, M., Marz, M., Stadler, P. & Backofen, R., 11. Sep 2014, In: *Algorithms for Molecular Biology*. 9, 19, 20 p.

Basin Hopping Graph: A computational framework to characterize RNA folding landscapes

Kucharik, M., Hofacker, I., Stadler, P. & Qin, J., 15. Mar 2014, In: *Bioinformatics*. 30, 14, p. 2009-2017

Geometry and Coarse-Grained Representations of Landscapes

Qin, J., Stadler, P. & Klemm, K., 2014, *Recent Advances in the Theory and Application of Fitness Landscapes, Emergence, Complexity and Computation*. Springer Publishing Company, Vol. 6. p. 153-176

2D meets 4G: G-quadruplexes in RNA secondary structure prediction

Qin, J. & Lorenz et al, R., Jul 2013, In: *IEEE - A C M Transactions on Computational Biology and Bioinformatics*. 10, 4, p. 832-844 12 p.

Distribution of Graph-Distances in Boltzmann Ensembles of RNA Secondary Structures

Backofen, R., Fricke, M., Marz, M., Qin, J. & Stadler, P. F., 2013, *Algorithms in Bioinformatics: 13th International Workshop, WABI 2013, Sophia Antipolis, France, September 2-4, 2013. Proceedings*. Darling, A. & Stoye, J. (eds.). Springer Publishing Company, p. 112-125 13 p. (Lecture Notes in Computer Science, Vol. 8126).

On topological RNA interaction structures

Qin, J. & Reidys, C., 2013, In: *Journal of Computational Biology*. 20, 7, p. 495-513 18 p.

The Trouble with Long-Range Base Pairs in RNA Folding

Amman, F., Bernhart, S. H., Doose, G., Hofacker, I. L., Qin, J., Stadler, P. F. & Will, S., 2013, *Advances in Bioinformatics and Computational Biology: 8th Brazilian Symposium on Bioinformatics, BSB 2013, Recife, Brazil, November 3-7, 2013, Proceedings*. Setubal, J. C. & Almeida, N. F. (eds.). Springer, p. 1-11 11 p. (Lecture Notes in Computer Science, Vol. 8213).

RNA folding algorithms with G-quadruplexes

Lorenz, R., Bernhart, S. H., Externbrink, F., Qin, J., Höner Zu Siederdisen, C., Amman, F., Hofacker, I. L. & Stadler, P. F., 2012

Target prediction and a statistical sampling algorithm for RNA-RNA interaction.

Huang, FW., Qin, J., Reidys, CM. & Stadler, PF., Nov 2009, In: *Bioinformatics* (Oxford, England).

Partition function and base pairing probabilities for RNA-RNA interaction prediction.

Huang, FW., Qin, J., Reidys, CM. & Stadler, PF., Aug 2009, In: *Bioinformatics* (Oxford, England).

Efficient counting and asymptotics of k-noncrossing tangled diagrams

Chen, W. Y. C., Qin, J., Reidys, C. M. & Zeilberger, D., 2009, In: *Electronic Journal of Combinatorics*.

Crossings and nestings in tangled diagrams

Chen, W. Y. C., Qin, J. & Reidys, C. M., 2008, In: *Electronic Journal of Combinatorics*.

Combinatorics of RNA structures with pseudoknots.

Jin, EY., Qin, J. & Reidys, CM., Sep 2007, In: *Bulletin of Mathematical Biology*.

Neutral networks of sequence to shape maps.

Jin, EY., Qin, J. & Reidys, CM., Sep 2007, In: *Journal of Theoretical Biology*.