

CV, Urban Larsson

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Personal details:

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Technion–Israel Institute of Technology
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Current position:

Postdoc with the Game theory group at Technion–Israel Institute of Technology, Haifa, Israel, host Dr. Reshef Meir, October 2016 - September 2018

Degree:

PhD in Mathematics, Chalmers, Goteborg, Sweden, *Impartial Games and Recursive Functions*, supervisors Prof. P. Hegarty and Doc. J. Wästlund, opponent Prof. V. Gurvich, September 2013

Editorial work and Books:

–Editor for the book *Games of No Chance 5*, forthcoming (2018) consisting of original peer reviewed research papers in Combinatorial Game Theory, Cambridge University Press, MSRI publications

–Associate Editor for International Journal of Game Theory; coauthor with B. von Stengel, C. P. Santos and A. S. Fraenkel of the preface for the forthcoming (2018) *Special issue on combinatorial games*, for IJGT

–We are currently accepting submissions for the next issue of Games of no Chance MSRI, CUP.

Awards:

–Killam Laureate, Izaak Walton Killam Postdoctoral Fellowships (2014, 2015)

–Aly Kaufman Fellowship (2017)

Research

Original peer reviewed published/accepted research papers in journals and books:

[1] E. Duchene, M. Heinrich, U. Larsson, A. Parreau, The switch operators and push-the-button games: a sequential compound over rulesets, *Theoret. Comput. Sci* 715 (2018) 71-85

- [2] J. Chappelon, U. Larsson, A. Maatsura, 2-player Tower of Hanoi, *Int. J. Game Theory 47, Special Issue on Combinatorial Games*. Invited paper from Combinatorial Game Theory Colloquium, Lisbon 2015 (2018)
- [3] N. Mc Kay, U. Larsson, R. J. Nowakowski, A. Siegel, Wythoff partizan subtraction, *Int. J. Game Theory 47, Special Issue on Combinatorial Games*, 2018. Invited paper from Combinatorial Game Theory Colloquium, Lisbon 2015 (2018)
- [4] M. Fisher, U. Larsson, Chromatic Nim finds a game for your solution, to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)
- [5] A. S. Fraenkel, U. Larsson, Take-away games on Beatty's theorem and the notion of k-invariance, to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)
- [6] E. Friedman, S. M. Garrabrant, U. Larsson, A. S. Landsberg, I. K. Phipps-Morgan, Geometric Analysis of a Generalized Wythoff Game, to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)
- [7] U. Larsson, M. Weimerskirch, Impartial games whose rule sets correspond to a given continued fraction, to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)
- [8] U. Larsson, J. Wästlund, Endgames in bidding chess, to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)
- [9] U. Larsson, R. J. Nowakowski, C. P. Santos, Game comparison through play, *Theoret. Comput. Sci.* (2017)
- [10] U. Larsson, R. J. Nowakowski, C. P. Santos, Games with guaranteed scores and waiting moves, *Int. J. Game Theory* (2017) 1–19
- [11] U. Larsson, I. Rocha, Eternal Picaria, *Recreational Mathematics Magazine*, 4(7) (2017); this is an original research paper, published in a high quality recreational math journal
- [12] U. Larsson, S. Rubinstein-Salzedo, Global Fibonacci Nim, *Int. J. Game Theory* (2017) 1–17
- [13] M. Cook, U. Larsson, T. Neary, A cellular automaton for blocking queen games, *Nat. Comput.* (2017) DOI 10.1007/s11047-016-9581-2 (an extended version of a paper in the conference proceedings [21])
- [14] E. Duchene, U. Larsson, S. Heubach, M. Dufour, Building nim, *Int. J. Game Theory* (2016) 45: 859

- [15] U. Larsson, J. Neto, R. J. Nowakowski and C. P. Santos, Guaranteed scoring games, *Electron. J. Combin.*, **23** (2016) P3.27
- [16] N. Fox, U. Larsson, An aperiodic subtraction game of nim-dimension two, *J. Integer Seq.*, **18** (2015), Article 15.7.4
- [17] U. Larsson, S. Rubinstein-Salzedo, Grundy values of Fibonacci nim, *Int. J. Game Theory*, (2015) 45: 617
- [18] U. Larsson, Restrictions of m-Wythoff Nim and p-complementary Beatty sequences, in: *Games of No Chance 4*, MSRI Publ. **63**, Cambridge University Press, (2015) 137–160
- [19] U. Larsson, J. Wästlund, Maharaja Nim: Wythoff's Queen meets the Knight, *Integers*, **14** (2014) G05
- [20] U. Larsson, Splitting sequences and Wythoff Nim extensions, *J. Integer Seq.*, **17** (2014) Article 14.5.7
- [21] U. Larsson, J. Wästlund, From heaps of matches to the limits of computability, *Electron. J. Combin.*, **20** (2013) P41
- [22] U. Larsson, Impartial games emulating one-dimensional cellular automata and undecidability, *J. Combin. Theory, Ser. A*, **120** (2013) 1116–1130
- [23] U. Larsson, The $*$ -operator and invariant subtraction games, *Theoret. Comput. Sci.*, **422** (2012) 52–58
- [24] U. Larsson, A Generalized Diagonal Wythoff Nim, *Integers*, **12** (2012) G2
- [25] U. Larsson, Blocking Wythoff Nim, *Electron. J. Combin.*, **18** (2011) P120
- [26] U. Larsson, P. Hegarty, A. S. Fraenkel, Invariant and dual subtraction games resolving the Duchêne-Rigo conjecture, *Theoret. Comput. Sci.*, **412** (2011) 729–735
- [27] U. Larsson, 2-PileNim with a restricted number of move-size imitations (Appendix by P. Hegarty), *Integers*, **9** (2009) G4 671–690
- [28] P. Hegarty, U. Larsson, Permutations of the natural numbers with prescribed difference multisets, *Integers*, **6** (2006) A3
- [29] A. Baltz, P. Hegarty, J. Knape, U. Larsson, T. Schoen, Sets of integers containing no solutions of the equation $ka=b+c$, *Electron. J. Combin.*, **12** (2005) R19

Peer reviewed published papers in conferences:

[30] M. Dufour, S. Heubach, U. Larsson, A misère-play star operator, in: M. Nathanson (ed.) *Combinatorial and Additive Number Theory II*: CANT, New York, NY, USA, 2015 and 2016 Springer, New York, 2017, the Springer Proceedings in Mathematics & Statistics series, volume 220. (2017)

[31] U. Larsson, Hopeful windows and fractals in cellular automata and combinatorial games, exploratory paper, Automata, Zurich (2016)

[32] M. Cook, U. Larsson, T. Neary, A cellular automaton for blocking queen games, *Cellular Automata and Discrete Complex Systems, 21st IFIP WG 1.5 International Workshop, Automata 2015, Turku, Finland, June 8-10, Proceedings*, J. Kari, (ed.) LNCS 9099 (2015) 71–84

Invited publications, surveys etc:

[33] U. Larsson, The game is not over yet: endgames in bidding chess, *Recreational Mathematics Colloquium V: Proceedings of the Recreational Mathematics Colloquium V*, Ludus, J. N. Silva (ed.) (2017); this is a popular version of the research paper [25]

[34] U. Larsson, R. J. Nowakowski, C. P. Santos, Scoring games: the state of play, an invited survey to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)

[35] E. Duchene, A. S. Fraenkel, V. Gurvich, N. B. Ho, C. Kimberling, U. Larsson, Wythoff visions, an invited survey to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)

[36] D. Singmaster, edited by U. Larsson, An historical tour of binary and tours, an invited survey to appear in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2018)

Submitted preprints of research papers:

[37] U. Larsson, R. J. Nowakowski, C. P. Santos, Absolute combinatorial game theory, arXiv:1606.01975; submitted to *E-JC*

[38] A. S. Fraenkel, U. Larsson, Playability and arbitrarily large rat games, arXiv:1705.03061; submitted to *Integers*

[39] A. Dailly, E. Duchene, U. Larsson, G. Paris, Partition games are pure breaking games; arXiv:1803.02621; submitted to *JCT - series A*

[40] G. Cohensius, U. Larsson, R. Meir, D. Wahlstedt, Cumulative Subtraction Games; arXiv; submitted to *E-JC*

[41] U. Larsson, R. Milley, R. J. Nowakowski, G. Renault, C. P. Santos, Progress on misère dead ends: game comparison, canonical form, and conjugate inverses; arXiv; submitted to *Contributions to Discrete Mathematics*

Theses (before PhD):

- Licentiate Thesis, *Sequences and Games Generalizing the Combinatorial Game of Wythoff Nim*, adviser Professor P. Hegarty, Chalmers (2009)
- Master Thesis, with J. Knape, *Sets of Integers and Permutations Avoiding Solutions to Linear Equations*, adviser Professor P. Hegarty, Göteborg University (2004)
- Fil. Kand. Thesis, *Quadratic Reciprocity*, adviser Professor J. Brzezinski, Göteborg University (2002)

Academic work

–Postdoc at Dalhousie University, Halifax, Canada, host Prof R. J. Nowakowski, June 2014 – Sep 2016

Responsible lecturer:

- Matrix Theory and Linear Algebra II, Math 2040, Dalhousie University, Halifax, Canada, July – Aug 2016
- Discrete mathematics, Elektroingenjörerna och Dataingenjörerna, mve070, Chalmers, Goteborg Sweden, Jan – April 2013: this course explored a new teaching method, and I presented the result at a seminar series initiated together with Prof. S. Bengmark, Chalmers
- Matematik 1, Sjöingenjörerna, Chalmers, Goteborg Sweden, Sep-Nov 2013

Teacher:

Several courses in Algebra, Calculus and Discrete mathematics at Chalmers & University of Goteborg 2004 -2013

Coauthors:

A. Balz, G. Cohensius, J. Chappelton, M. Cook, A. Dailly, E. Duchêne, M. Dufour, M. Fisher, N. Fox, A. S. Fraenkel, E. Friedman, S. Garrabrant, V. Gurvich, P. Hegarty, M. Heinrich, S. Heubach, N. B. Ho, C. Kimberling, J. Knape, A. Landsberg, A. Maatsura, R. Meir, R. Milley, N. McKay, T. Neary, J. P. Neto, R. J. Nowakowski, G. Paris, A. Parrau, G. Renault, I. Rocha, S. Rubinstein-Salzedo, C. P. dos Santos, T. Schoen, A. Siegel, D. Singmaster, D. Wahlstedt, M. Weimerskirch, J. Wästlund

Coding expertise:

Many of the below published/accepted research papers depended in my coding skills in various computer languages, such as C, C++, Maple, Mathematica, Python, and more. I find it easy to learn new languages as required. I have used Matlab in teaching and courses.

Language:

I am fluent in English and Swedish, and I know German (fluent in reading).

Work in progress:

I am leading three projects with my colleagues at the Technion Game Theory group, with Reshef Meir, Gal Cohensius and Ron Lavi. These projects concern mechanism design, game theory, algorithms and auctions. I have ongoing projects at various stages with A. S. Fraenkel, D. Iannucci, M. Mhalla, C. P. dos Santos, R. J. Nowakowski, A. N. Siegel, A. Martinsson, J. Wästlund, S. Rubinstein-Salzedo, and others.

Conference and workshop organizer:

Organizer of Games at Carmel, workshop in Combinatorial Game Theory, 14-17 May 2018, Technion, Haifa, Israel. In the scientific committee for Combinatorial Game Theory Colloquium I 2015, II 2017, and III 2019, hosted by Dr. C. P. Dos Santos, University of Lisbon Portugal. Co-organizer for Games at Dal workshop in combinatorial game theory, 2015 and 2016, with Dr. R. J. Nowakowski, Dalhousie University, Halifax, Canada.

Invited talks and research collaborations:

I have been an invited researcher/speaker at around 100 international universities, conferences and seminars starting 2004, including: B.I.R.S. CGT workshops, Berkeley ICSI UC, CANT CUNY, Chalmers Discrete Seminar, Claremont McKenna College W.M. Keck Science Department, Corner Brook University, CMS Summer meeting, Czech Academy of Sciences, IBFI Schloss Dagstuhl, Dalhousie University, Goteborg University Logikseminariet, University of Grenoble Laboratoire LIG, INTEGERS UWG, Kamloops University TRUe Games Workshop, KTH, University of Lisbon, Lyon 1, MDH MAM-seminar, MIT Combinatorics Seminar, Université de Montpellier Institut Montpelliérain Alexander Grothendieck, The National Museum of Mathematics NYC MOVES conference, NorCom, Recreational Mathematics Colloquia and Board games studies Ludus Ponta Delgada Azores, Rutgers The State University of New Jersey, Stony Brook University Worksh. Comput. Game Theory, Technion, Tel Aviv University AMS-IMU meeting, Turku University Automata, Université du Québec a Montreal, Vetenskapsfestivalen Chalmers/GU, University of the Virgin Islands, Weizmann Institute of Science, West Chester University, University of Zurich INI, Alfréd Rényi Institute of Mathematics.

Other teaching/work/study

I have been teacher and and examiner for several courses in Computing, Media, Mathematics and Physics, including class superintendent at Polhemsgymnasiet, Lindholmens Tekniska Gymnasium and International IT-college of Sweden, Göteborg. I have worked in many fields as a journalist, photographer, filmmaker, media teacher, electrician, and technician; employed by various companies, including Siemens AG, research department, Munich. I studied 2.5 years at Y-linjen, Linköpings Tekniska Högskola, I am certified teacher in: Media (film photography

and radio production) Medialinjen Biskops Arnös Folkhögskola, director B. Åkerlund; Alexander Technique graduated at The Centre for Training for director D. Gorman. I won a price in best production at Västerås film festival, and produced a documentary that was broadcasted on Swedish television, presented by the famous Swedish actor and director Gösta Ekman.