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Current position: Associate Professor at Dept. IEOR, IIT Bombay, India.

Degrees:
–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.
–Degree of Master of Science in Mathematics, Göteborgs Universitet, supervisor Prof. Peter Hegarty, February 2005.

Editorial work, books, conference organizer:
–Editor for the forthcoming volume *Games of No Chance 6,* original peer reviewed research papers and surveys in Combinatorial Game Theory, Cambridge University Press & MSRI publications (2025).
–Editor for the volume *Games of No Chance 5*, 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 *Special issue on combinatorial games*, IJGT (2018); co-editor with B. von Stengel and C. P. Santos of a forthcoming *Special issue on combinatorial games*, IJGT (2025).
–I have organized several conferences and workshops, and most recently the conference Combinatorial Games at Mumbai 2024, and with C. P. dos Santos CGTC5 Lisbon January 2025; see below for more details.

Awards:
–Aly Kaufman Fellowship (2017).
–Killam Laureate, Izaak Walton Killam Postdoctoral Fellowships (2014, 2015).

Teaching interests:
I am comfortable teaching any undergraduate course in Mathematics and Computer Science. My special interests are Combinatorics, Discrete Mathematics Algorithms

and Game Theory. I am happy teaching my speciality *Combinatorial Game Theory* at any level.

Research: in total 48 published/accepted research papers, and 64 by including preprints, surveys, conference papers etc.

Original peer reviewed published research papers in journals and books:

[43] P. Kant, U. Larsson, R. K. Rai and A. V. Upasany, Constructive comparison in bidding combinatorial games, *Int. J. Game Theory* (2025).

[42] T. Abuku, S. Kimura, H. Kiya, U. Larsson, I. Saha, K. Suetsugu, T. Yamashita Enforce and selective operators of combinatorial games, *Int. J. Game Theory* (2024).

[41] U. Larsson, R. J. Nowakowski, C. P. Santos, A complete solution for a nontrivial ruleset with entailing moves, *Electron. J. Combin*. **31** (2024) P4.65

[40] U. Larsson and I. Saha Subtraction games in more than one dimension, *Theoret. Comput. Sci*. **1016** (2024) 114775.

[39] P. Kant, U. Larsson, R. K. Rai, and A. V. Upasany, Bidding combinatorial games, *Electron. J. Combin*. **31** (2024) P1.51.

[38] U. Larsson, R. J. Nowakowski, Atomic weights and the combinatorial game of bipass, *Discr. Math.* **346**, (2023)

[37] U. Larsson, R. Milley, R. J. Nowakowski, G. Renault, and C. P. dos Santos, Recursive comparison tests for dicot and dead-ending games under misère play, *Integers*, **21B,** memorial volume for Berlekamp, Conway and Guy (2021) A16.

[36] U. Larsson, R. J. Nowakowski, C. P. Santos, Impartial games with entailing moves, *Integers*, **21B,** memorial volume for Berlekamp, Conway and Guy (2021) A17.

[35] D. E. Iannucci, U. Larsson, Game values of arithmetic functions, *Integers*, **21B,** *Memorial volume for Berlekamp, Conway and Guy* (2021) A14.

[34] Y. Babichenko, U. Larsson, Golden games, *Theoret. Comput. Sci*., **891,** (2021) 50-58.

[33] U. Larsson, N. Patel, R. K. Rai, Discrete Richman-bidding scoring games, *Int. J. Game Theory,* **50**, (2021) 695-728.

[32] A. Dailly, E. Duchene, U. Larsson, G. Paris, Partition games, *Discrete Applied Mathematics,* **285**, (2020) 509-525.

[31] G. Cohensius, U. Larsson, R. Meir, D. Wahlstedt, Cumulative subtraction games, *Electron. J. Combin*. **26**, (2019) P4.52.

[30] A. S. Fraenkel, U. Larsson, Playability and arbitrarily large rat games, *Integers,* **19** (2019), G04.

[29] M. Fisher, U. Larsson, Chromatic Nim finds a game for your solution, in *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 321-339.

[28] A. S. Fraenkel, U. Larsson, Take-away games on Beatty's theorem and the notion of k-invariance, in *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 341-350.

[27] E. Friedman, S. M. Garrabrant, U. Larsson, A. S. Landsberg, I. K. Phipps-Morgan, Geometric analysis of a generalized Wythoff game, in *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 351-380.

[26] U. Larsson, M. Weimerskirch, Impartial games whose rule sets correspond to a given continued fraction, in *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 411-427.

[25] U. Larsson, J. Wästlund, Endgames in bidding chess, in *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 429-446.

[24] 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.

[23] J. Chappelon, U. Larsson, A. Maatsura, 2-player Tower of Hanoi, *Int. J. Game Theory* **47**, *Special Issue on Combinatorial Games, 2018.* Invited paper from Combinatorial Game Theory Colloquium, Lisbon 2015 (2018) 463–486.

[22] 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) 613–652.

[21] U. Larsson, R. J. Nowakowski, C. P. Santos, Games with guaranteed scores and waiting moves, *Int. J. Game Theory* **47**, Special Issue on Combinatorial Games, 2018. Invited paper from Combinatorial Game Theory Colloquium, Lisbon 2015 (2018) 653–671.

[20] U. Larsson, S. Rubinstein-Salzedo, Global Fibonacci Nim, *Int. J. Game Theory* **47**, Special Issue on Combinatorial Games, 2018. Invited paper from Combinatorial Game Theory Colloquium, Lisbon 2015 (2018), 595–611.

[19] U. Larsson, R. J. Nowakowski, C. P. Santos, Game comparison through play, *Theoret. Comput. Sci.* **725** (2017) 52-63.

[18] 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.

[17] M. Cook, U. Larsson, T. Neary, A cellular automaton for blocking queen games, *Nat. Comput*. (2017) 16: 397–410 (an extended version of a paper in the conference proceedings [32]).

[16] 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.

[14] N. Fox, U. Larsson, An aperiodic subtraction game of nim-dimension two, *J. Integer Seq*., **18** (2015), Article 15.7.4.

[13] U. Larsson, S. Rubinstein-Salzedo, Grundy values of Fibonacci nim, *Int. J. Game Theory*, (2015), 45: 617.

[12] U. Larsson, Restrictions of m-Wythoff Nim and p-complementary Beatty sequences, *Games of No Chance 4*, MSRI Publ. **63**, Cambridge University Press, (2015), 137–160.

[11] U. Larsson, J. Wästlund, Maharaja Nim: Wythoff's Queen meets the Knight, *Integers*, **14** (2014), G05.

[10] U. Larsson, Splitting sequences and Wythoff Nim extensions*, J. Integer Seq.*, **17** (2014), Article 14.5.7.

[9] U. Larsson, J. Wästlund, From heaps of matches to the limits of computability, *Electron. J. Combin.*, **20** (2013), P41.

[8] U. Larsson, Impartial games emulating one-dimensional cellular automata and undecidability, *J. Combin. Theory, Ser. A,* **120** (2013), 1116–1130.

[7] U. Larsson, The *-operator and invariant subtraction games, *Theoret. Comput. Sci.,* **422** (2012) 52–58.

[6] U. Larsson, A Generalized Diagonal Wythoff Nim, *Integers,* **12** (2012), G2.

[5] U. Larsson, Blocking Wythoff Nim, *Electron. J. Combin.*, **18** (2011), P120.

[4] U. Larsson, P. Hegarty, A. S. Fraenkel, Invariant and dual subtraction games resolving the Duchêne-Rigo conjecture, *Theoret. Comput. Sci.,* **412** (2011), 729–735.

[3] U. Larsson, 2-PileNim with a restricted number of move-size imitations (Appendix by P. Hegarty), *Integers,* **9** (2009), G4 671–690.

[2] P. Hegarty, U. Larsson, Permutations of the natural numbers with prescribed difference multisets, *Integers,* **6** (2006), A3.

[1] 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:

[46] 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).

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

[44] 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:

[56] A. M. Davies, U. Larsson, R. J. Nowakowski, C. P. Santos, A. N. Siegel, R. Milley, Combinatorial game theory monoids and their absolute restrictions—a survey; **to appear** in *Games of No Chance 6*, MSRI/CUP.

[55] U. Larsson, P. Kant, Survey on Richman bidding combinatorial games; **to appear** in *Games of No Chance 6*, MSRI/CUP.

[54] U. Larsson, I. Saha, A brief conversation about subtraction games; **to appear** in *Games of No Chance 6*, MSRI/CUP.

[53] U. Larsson, CombinArtorial games, in (Ed. Bharath Sriraman) Handbook of the Mathematics of the Arts and Sciences (2020).

[52] U. Larsson, A beautiful formula for game convergence, *Recreational Mathematics Colloquium VI: Proceedings of the Recreational Mathematics Colloquium VI*, Ludus, J. N. Silva (ed.) (2019); this is a popular version of the research paper [31].

[51] 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].

[50] U. Larsson, R. J. Nowakowski, C. P. Santos, Scoring games: the state of play, an invited survey in *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 89-111.

[49] E. Duchene, A. S. Fraenkel, V. Gurvich, N. B. Ho, C. Kimberling, U. Larsson, Wythoff visions, an invited survey in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 35-87.

[48] D. Singmaster, edited by U. Larsson, An historical tour of binary and tours, an invited survey in: *Games of No Chance 5*, MSRI Publ. **70**, Cambridge University Press (2019) 207-245.

[47] A. Fraenkel, U. Larsson, C. P. Santos, B. von Stengel, Special issue on combinatorial game theory, *Int J Game Theory* (2018) 47:375–377.

Preprints of research papers (5 accepted):

[65] A. Dargad, U. Larsson, N. Balachandran, Temperatures of Robin Hood, arXiv:2501.07239.

[64] U. Larsson, R. J. Nowakowski, C. P. dos Santos, Affine Normal Play, arXiv:2402.05732; **to appear** in *Games of No Chance 6*, MSRI/CUP.

[63] U. Larsson, R. J. Nowakowski, C. P. Santos, Infinitely many absolute universes, arXiv:2303.05198; **to appear** *in Games of No Chance 6*, MSRI/CUP.

[62] U. Larsson, R. Meir, Y. Zick, Cumulative games: Who is the current player?, arXiv:2005.06326.

[61] U. Larsson, S. Rubinstein-Salzedo, A. N. Siegel, Memgames, arXiv:1912.10517; **to appear** in *Games of No Chance 6*, MSRI/CUP.

[60] U. Larsson, R. J. Nowakowski, C. P. Santos, Absolute combinatorial game theory, arXiv:1606.01975; **to appear** in *Games of No Chance 6*, MSRI/CUP.

[59] 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: 1807.11297; splitted into two documents, first one published in *Integers* ([37] above). The second one **to appear** in *Games of No Chance 6*, MSRI/CUP.

[58] U. Larsson, Vicious cycles and questions without answers, Qeios CJTKN.

[57] U. Larsson, Comply subtraction games avoiding arithmetic progressions, preprint at arxiv.org/1206.5359.

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:
– Visiting Associate Professor, IEOR, IITB, Feb 3 2022 – March 29 2023
–Research Fellow, School of Computing, National University of Singapore, host Prof. Reza Shokri, July 2020 - June 2021.
–Research Fellow, School of Computing, National University of Singapore, host Prof. Yair Zick, April 2019 - June 2020.
–Postdoc with the Game theory group at Technion–Israel Institute of Technology, Haifa, Israel, host Prof. Reshef Meir, October 2016 - March 2019.
–Killam Postdoc at Dalhousie University, Halifax, Canada, host Prof. R. J. Nowakowski, June 2014 – Sep 2016; the position was competitive over all the faculties of Arts, Science, Engineering, and Computer Science and only 2 were awarded that year.

Responsible lecturer:
–IE616-2023-2, Decision Analysis and Game Theory, IEOR, IITB (with Veeraruna Kavitha).
–IE619-2023-1, Combinatorial Game Theory, IEOR, IITB (proposed by me).
–IE616-2022-2, Decision Analysis and Game Theory, IEOR, IITB.
–IE509-2022-1, Computer Programming Lab, IEOR, IITB.
–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 2014: 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. I am teaching Game Theory at various levels.

Three PhD students:

- My current PhD students are Anjali Bhagat, Prem Kant (IEOR, IITB) and Ankita Dargad (Mathematics, IITB)
–I also teach several students at various levels (B.Tech, M.Tech, etc) at IIT Bombay. IE 797-2022-1, IE 685-2022-1, IES801-2022-1, etc

More than 50 Coauthors:
T. Abuku, Y. Babichenko, N. Balachandran, A. Balz, G. Cohensius, J. Chappelon, M. Cook, A. Dailly, A. Dargad, E. Duchêne, M. Dufour, M. J. Fisher, N. Fox, A. S. Fraenkel, E. Friedman, S. Garrabrant, V. Gurvich, P. Hegarty, M. Heinrich, S. Heubach, N. B. Ho, D. E. Iannucci, P. Kant, C. Kimberling, S. Kimura, H. Kiya, J. Knape, A. Landsberg, R. Lavi, A. Maatsura, R. Meir, R. Milley, N. McKay, T. Neary, J. P. Neto, R. J. Nowakowski, G. Paris, A. Parrau, N. Patel, I. K. Phipps-Morgan, R. K. Rai, G. Renault, I. Rocha, S. Rubinstein-Salzedo, I. Saha, C. P. dos Santos, T. Schoen, A. A. Siegel, A. N. Siegel, D. Singmaster, B. Von Stengel, K. Suetsugu, D. Wahlstedt, M. Weimerskirch, J. Wästlund, T. Yamashita, M. Yokoo, Y. Zick.

Coding expertise:
Many of my published/accepted research papers depend on my coding skills in various computer languages, such as C, C++, Maple, Mathematica, Python, CG-suit, and more. I have recently started interacting with chatGPT about the coding part of research. It is interesting. (But regarding the theoretical part of research, so far I have seen no benefit of consulting chatGPT.)

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

Work in progress:
I am involved in many projects, specializing in Combinatorial Game Theory, and branching (Economic) Game Theory, Number Theory, Combinatorics, Mechanism Design, Algorithms, Computability, Art & Mathematics, and more.

Conference and workshop organizer:
I am a constant member of the scientific committee for Combinatorial Game Theory Colloquium I 2015, II 2017, III 2019, and IV 2023, hosted by Dr. C. P. dos Santos, University of Lisbon Portugal. I was a co-organizer for Games at Dal workshops in Combinatorial Game Theory, 2015 and 2016, with Dr. R. J. Nowakowski, Dalhousie University, Halifax, Canada. I was in the program committee for three Games, Agents, and Incentives Workshops (GAIW@AAMAS 2020, 2021 and 2022), inv. By prof. Yair Zick. I co-organized, with Dr. Erika Berenice Roldan Roa, and lectured at a CGT-workshop at Ohio State University (2019). I organized and lectured a CGT-workshop at IIT Bombay, invited by Prof. Mallikarjuna Rao (2019). I taught CGT at the AAMAS 2019 meeting. I organized a CGT-workshop “Games at Carmel”, 14-17 May 2018, at Technion, Haifa, Israel. I taught several combinatorial games' workshops and seminars in Japan, May 2023, at the National Instititue of Informatics (Tokyo), Kyoto University, and Kyushu University; https://sites.google.com/view/jcgtw/%E7%A0%94%E7%A9%B6%E9%9B%86%E4%BC%9A. Together with my

students Anjali Bhagat, Prem Kant and Prof. Mallikarjuna Rao, we recently organized a pioneering international conference Combinatorial Games at Mumbai 2024, with more than 60 participants from US, Japan, Canada, Portugal and India; https://www.ieor.iitb.ac.in/Combinatorial_Games.

Invited talks and research collaborations:
I have been an invited researcher/speaker at more than 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, Kyoto University, Kyushu University, MDH MAM-seminar, MIT Combinatorics Seminar, Université de Montpellier Institut Montpelliérain Alexander Grothendieck, National Instititue of Informatics Tokyo, The National Museum of Mathematics NYC MOVES conference, NIT Nagaland, 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," Universite du Quebec 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, IIT Bombay, IIT Gandhinagar, NUS, NTU, SUTD.

Other hobby/teaching/work/study

As I arrived in India, Maharashtra Go Association started to organize monthly Go meetings here at IEOR, IITB (and I am one of the strongest Go players in India). I have been teacher 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.