Personal Data: *Professor*
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                                            Department of E and Computer Science
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Education: · Faculty, York University, Toronto, 1995-present
                 · Postdoctoral-Fellow, International Comp. Sci. Inst., Berkeley CA, 1993-1995.
                 · Ph.D., Computer Science, Univ. of Toronto, 1993.
                       "Time-Space Lower Bounds for Undirected and Directed *st*-Connectivity
                       on JAG Models."   Thesis adviser: *Dr. Faith Ellen.*
                 · M.S., Computer Science, Univ. of Toronto, 1990.
                       "Element Distinctness on COMMON."   Thesis adviser: *Dr. Faith Ellen.*
                 · B.Math, Co-op Bachelor of Mathematics, Univ. of Waterloo, 1987.

Research   · machine learning
Interests: · scheduling multi-processor jobs
                  · secure data transmission over networks for multi-media applications
                  · complexity theory
                  · probability theory
                  · parallel lower bounds and algorithms
                  · graph theory, combinatorics, and optimization

Masters (Co) Supervision:

· Chester Wyke, Masters (Quite involved supervisor Urner), 2024.
· Karan Singh, Masters (Co-supervisor Urner), Started 2019.
· Yunge Had, Masters (Co-supervisor Tourlakis), Started 2019.
· Kowsar Hossain, Masters (Supervisor Datta), "An Efficient MAC protocol for Wireless Sensor
     and Ad Hoc Networks," 2017. Present Position: Lecturer, Khulna University of Engineer-
     ing and Technology
· Toni Kunic, Masters (Supervisor Tsotsos) 2017 "Program Compiler: Understanding natural
     languages to execute tasks." Currently: Computer Vision Researcher, York U.
· Feng Gao, Masters (joint with Tourlakis), "A Short and Readable Proof of Cut Elimination for
     Two First-Order Modal Logics", 2016
· Stephen Voland, Masters, "Random Polyhedral Scenes", 2015. Currently: Software Engineer
     at bid13.com - Online Storage Auctions
· Nassim Nasser, Masters 2008.
· James Hyukjoon Kwon, Masters 2008.
· Jaisingh Solanki, Masters 2007.

Post Doc (Co) Supervision:

· Oscar Gonzalez, Post Doc (Supervisor Tsotsos) 2017 "Short and Long-Term Attentional Firing Rates Can Be Explained by ST-Neuron Dynamics Frontiers in Neuroscience." Currently: York

· Donald Chinn, postdoctoral fellowship 1995.

Co-Supervision not at York:

· Venkatesh Medabalimi, Doctorate (Supervisor Cook) 2018
   (We published two branching program lower bound papers together.)

· Tasos Sidiropoulos, Post Doc 2008-2009.

· I took an advisory role with the University of Toronto graduate students I. Mertz, V. Medabalimi, D. Achlioptas, C.K. Poon, and G. Barnes. I wrote papers with each of these people.

Masters Supervision in Africa:

· Chilperic Armel Foko Kuate, Masters, AIMS-Ghana, 2016 "Reverse engineering of T-cell Proliferation dynamics." Has done a second masters and has been teaching. We are working on getting him a visa to study at York University

· Guy Fabrice Gounoue, AIMS-Cameroon, 2016 "Differential equations governing rabies populations in Sub-Saharan Africa." We have been in regular contact. Met once in England. Currently: PhD in Germany and South Korea

· Salvatory Roman Kessy, Masters AIMS-Tanzania, 2016 "Actuarial models for Farmers in Tanzania." Currently: PhD at Southampton Uni in UK on full Chevening scholarship and will return to Tanzania to fill a deep need for Actuaries

· Leclaire Anjipu, Masters, AIMS-Senegal, 2016 "Big Data Algorithms." Currently: Big Data, Smile Open Source Solutions

· Evans Okyere, Masters, AIMS-Tanzania, 2016 "Applications of line graphs."

Under Graduate Supervision:

· Laily Ajellu 4070 project 2024 Cubatorin
· Pedram Ahadinejad 4070 project 2020
· Mahmoudreza Eskandarijam 4070 project 2020
· Goharanpour Bardia, 4070 project 2018
· Alexandra Zaslavsky, 4070 project 2018
· CJ D'Alimonte, 4080 project 2017
· Jake Peters, 4080 project 2015
· Chang-Han Chiang, 4080 project 2013
· Rubin Sung Hoon Yoo, 4080 project 2012
· Oren Shemesh, 4080 project 2012
· Doug Scheurich, 4080 project 2012
· Kian Shokouhi, Undergrad Thesis 2008.
· Daniel Natapov, Undergrad Thesis 2007.
· Geri Grolinger, Undergrad Thesis 2006.

Teaching Experience:

- Math 1090 – Formal Proof Systems - Worked crazy hard to learn and teach in a brand new way.
- COSC 1030 – Intro to Computer Science II - Course Director (6 times 95-98)
- CSE 2001 – Intro to the Theory of Computation (4 times)
- CSE 2011 – Intro to Data Structures (1 time)
- CSE 3510 – Data Structures (F95)
- CSE 3101 – Intro to Algorithms (22 times 99-)
- CSE 4022 – Advanced Theory (W99)
- CSE 4111 – Computability & Complexity (2 times W11-)
- COSC 5115,6115 – Grad Course in Complexity Theory (W96,F98)
- COSC 6121,6111 – Grad Algorithms (8 times W04-)

Service:

- ACM Programming J. Edmonds (chair)
- Awards and Scholarships
- Petitions Committee (chair)
- Department and Curriculum committee (LCS) EECS Science programs representative.
- Planning, Academic Resources and Research (PARR)
- Hiring (two years)
- T & P (a few years)
- undergrad advising (many years)
- high school visits (five times)
- executive committee (one year)
- graduate admissions (many years)
- Curriculum (three years)
- Internship Coordinator (two years)

Reviewing Conferences and Journals:

- I have never been on a committee but I help review about six papers a year.

Awards:

- Supervised Laily Ajellu winning Second Prize at the Lassonde Undergraduate Research Award Conference 2024 // Cubatorin: The Chatbot Incubator for Angel Investors and Startups https://cubatorin.com/
- Best CS Teaching 20??
- York's Merit Award [2000,2001,2002,2009]

External Research Funding:

- New Frontiers in Research Fund – Exploration 2019 Application ID: NFRFE-2019-00549 Title: Molecular Data Stores: DNA as a Medium for Information Storage with Sebastian Magierowski
- NSERC ('19-'24) [$23,000/yr × 5]
- On going member at Centre for Innovation in Computing @ Lassonde
- NSERC ('11-'16) [$15,000/yr × 5]
- NSERC ('05-'10) [$32,000/yr × 5]
- NSERC ('00-'04) [$32,000/yr × 5]
- CITO (13 people), Fundamental Issues in Computing, (1998-2000), [$90,000/yr × 2]
- A NCE grant called MITACS (co-applicant with 200 others).
- NSERC ('95-'99) [$25,000]
- NSF Postdoctoral Scholarship, (1993–1995) [$33,000 US/yr × 2]
- NSERC Postdoctoral Scholarship, (1993–1995) [$30,000/yr × 2]
- Ontario Graduate Scholarship (OGS), (1991–1993)
- NSERC Graduate Scholarship, (1989–1991)

Papers in Refereed Journals (and Refereed Conferences):

- J. Edmonds, A. Potukuchi " "All" Critical Gradient Descent Solutions Are Optimal & Small Running time (Given Minimal Over-Parameterization)," 22 pages *rejected*, 2024.

- J. Edmonds, K. Singh, R. Urner, "Implications of Modeled Beliefs for Algorithmic Fairness in Machine Learning," *the Workshop on Algorithmic Fairness through the Lens of Causality and Robustness - Workshop @ NeurIPS*, 2021.

- S. Davis, J. Edmonds, and R. Impagliazzo, "Power of Free Branching in a General Model of Backtracking and Dynamic Programming Algorithms," Submitted to *Algorithmica.*

- J. Edmonds and Alex Edmonds, "Search Time when Solving Random Jigsaw Puzzles with a Planted Solution," Submitted to *Algorithmica.*

- J. Edmonds and M. Luby, "Erasure Codes with a Hierarchical Bundle Structure" Submitted to *IEEE Transactions on Information Theory,.*

- M. Solbach, S. Voland, J. Edmonds, and J. Tsotsos, "Random Polyhedral Scenes: An Image Generator for Active Vision System Experiments," *arXiv:1803.10100*, 2018

- K. Hossain, S. Datta, I. Hossain, and J. Edmonds, "ResVMAC: A Novel Medium Access Control Protocol for Vehicular Ad hoc Networks," *Procedia Computer Science*, 109, p. 432-439, 2017.

- S. Dobreva, J. Edmonds, D. Komm, R. Kralovic, R. Kralovic, S. Krug, and T. Momke, "Improved Analysis of the Online Set Cover Problem with Advice" *Journal of Theoretic Computer Science* 2017.

- A. Chattopadhyay, J. Edmonds, F. Ellen, and T. Pitassi, "A Little Advice Can Be Very Helpful," or "Upper and Lower Bounds on the Power of Advice,"

    - *SODA, ACM Symp. on Discrete Algorithms*, 2012.
    - SIAM Journal on Computing (SICOMP), 2016

Papers in Refereed Journals (and Refereed Conferences) Cont.:

· J. Edmonds and K. Pruhs, "Scalably Scheduling Processes with Arbitrary Speedup Curves,"

 · *ACM Transactions on Algorithms* 8(3): 28 (2012)
 · *SODA, ACM Symp. on Discrete Algorithms*, 2009, p. 685-692.

· J. Edmonds, "On the Competitiveness of AIMD-TCP within a General Network,"

 · *Journal Theoretical Computer Science*, 2012
 · *Lecture Notes in Computer Science*, Volume 2976/2004.
 · *LATIN, Latin American Theoretical Informatics,* pp. 577-588, 2004.

· J. Edmonds and K. Pruhs, "Cake Cutting Really is Not a Piece of Cake,"

 · *ACM Transactions on Algorithms* 7(4): 51 (2011)
 · *SODA, ACM Symp. on Discrete Algorithms*, pp. 271-278 2006.

· H. Chan, J. Edmonds, T. Lam, L. Lee, A. Marchetti-Spaccamela, and K. Pruhs, "Nonclairvoyant Speed Scaling for Flow and Energy,"

 · *Algorithmica* 61(3): 507-517 (2011)
 · *STACS, The 26th International Symposium on Theoretical Aspects of Computer Science*, pp. 255-264, 2009.
 · CoRR abs/0902.1260: (2009)

· H. L. Chan, J. Edmonds, and K. Pruhs, "Speed Scaling of Processes with Arbitrary Speedup Curves on a Multiprocessor,"

 · *Theory of Computing Systems*, 2011
 · *SPAA, ACM Symp. of Parallelism in Algorithms and Architectures*, 2009, p. 1-10.

· J. Edmonds, S. Datta, and P. Dymond, "TCP is Competitive with Resource Augmentation (Against a Limited Adversary),"

 · *Theory of Computing Systems*, Vol 47 pp. 137-161, 2010.
 · *SPAA, ACM Symp. of Parallelism in Algorithms and Architectures*, pp. 174-183, 2003.

· J. Edmonds, "Every Deterministic Nonclairvoyant Scheduler has a Suboptimal Load Threshold,"

 · *Journal of Scheduling*, 2010.
 · Dagstuhl Seminar Proceedings, 2010.

· J. Edmonds, "Embedding into l_∞^2 is Easy Embedding into l_∞^3 is NP-Complete",

 · *The Journal of Discrete and Computational Geometry,* pp.747-765 2008.
 · *SODA, ACM Symp. on Discrete Algorithms,* 2007

· J. Edmonds and K. Pruhs, "A Maiden Analysis of Longest Wait First,"

 · *ACM Transactions on Algorithms,* Volume 1 Issue 1, pp. 14-32, 2005
 · *SODA, ACM-SIAM Symposium on Discrete Algorithms,* 2004

· J. Edmonds and K. Pruhs, "Multicast Pull (Broadcast) Scheduling: When Fairness Is Fine,"

 · *Special Issue Algorithmica on Online Algorithms*, Volume 36, pg. 315-330, 2003.
 · *SODA, ACM-SIAM Symposium on Discrete Algorithms,* 2002, p. 421-430.

Papers in Refereed Journals (and Refereed Conferences) Cont.:

· J. Edmonds, J. Gryz, D. Liang, R. Miller, "Mining for Empty Rectangles in Large Data Sets",

  · *Journal Theoretical Computer Science*, Vol 296, No 3, pp. 435-452, 2003.
  · Patented.
  · *International Conference on Database Theory*, 2001, pg 174-188.
  · Technical Report CSRG-410 Dept. of Comp. Sci., University of Toronto.

· J. Edmonds, D. Chinn, T. Brecht, X. Deng, "Non-clairvoyant Multiprocessor Scheduling of Jobs with Changing Execution Characteristics",

  · *Special Issue of Journal of Scheduling on "Online Problems"*, #6:3, pp 231-250, 2003.
  · *STOC, ACM Symp. on Theory of Computing*, pp. 120-129, 1997.

· J. Edmonds, R. Impagliazzo, S. Rudich, and J. Sgall, "Communication Complexity Towards Lower Bounds on Circuit Depth,"

  · *Journal of Computational Complexity,* 10: pp 210-246, 2001.
  · *FOCS, Symp. Foundations of Computer Science*, pp. 249-257, 1991.

· J. Edmonds "Scheduling in the Dark",

  · Improved results: manuscript 2001.
  · *Blum's Special Issue of the Journal of Theoretic Computer Science,* 235:109-141, 2000.
  · *STOC, ACM Symp. on Theory of Computing*, pp. 179-188, 1999.

· P. Beame, S. Cook, J. Edmonds, R. Impagliazzo, and T. Pitassi, "The relative complexity of NP search problems,"

  · *Journal of Computer and System Sciences,* 57:3-19, 1998. Special issue of invited papers from 1995 STOC.
  · *STOC, ACM Symp. on Theory of Computing*, pp. 315-324, 1995.

· G. Barnes, J. Edmonds, "Time–Space Lower Bounds for Directed ST-Connectivity on Graph Automata Models (JAG),"

  · *SIAM Journal on Computing*; Volume 27, Number 4, pp. 1190-1202, 1998.
  · *FOCS, Symp. on Foundations of Comp. Sci.*, pp. 228–237, 1993.

· J. Edmonds, "Time–Space Tradeoffs for Undirected ST-Connectivity on a Graph Automata (JAG),"

  · *SIAM Journal on Computing*; Volume 27, Number 5, pp. 1492-1513, 1998.
  · *STOC, ACM Symp. on Theory of Computing*, pp. 718-727, 1993.

· J. Edmonds, and C.K. Poon, D. Achlioptas, "Tight lower bounds for *st*-connectivity on NN-JAGs",

  · *SIAM Journal on Computing,* 1997.

· J. Edmonds, "Fundamental study removing Ramsey theory: lower bounds with smaller domain size,"

  · *Journal of Theoretical Computer Science,* 172, pp. 1-41, 1997.
  · *Structures in Complexity Theory*, pp. 322-332, 1991.

Papers in Refereed Journals (and Refereed Conferences) Cont.:

· A. Albanese, J. Blömer, J. Edmonds, M. Luby, and M. Sudan, "Prioritized Encoding Transmission,"

> · *IEEE Transactions on Information Theory*, Vol. 42, No. 6, 1996.
> · *FOCS, Symp. on Foundations of Comp. Sci.*, pp. 604–612, 1994.
> · *ICSI Technical Report TR94-058.*

Papers in Refereed Conference Proceedings (Submitted to Journals):

· J. Edmonds, V. Medabalimi, and T. Pitassi, "Hardness of Function Composition for Semantic Read once Branching Programs," *Computational Complexity Conference*, 2018.

· S. Cook, J. Edmonds, V. Medabalimi, and T. Pitassi, "Lower Bounds for Nondeterministic Semantic Read-Once Branching," *International Colloquium on Automata, Languages and Programming (ICALP)*, 2016.

· S. Datta, J. Edmonds, and K. Hossain, "An Efficient MAC protocol for Wireless Sensor and Ad Hoc Networks" *ANT, Int. Conf. on Ambient Systems, Networks and Technologies*, 2015.

· J. Edmonds, S. Im and B. Moseley, "Online Scalable Scheduling for the ℓ_k-norms of Flow Time Without Conservation of Work," *SODA, ACM Symp. on Discrete Algorithms*, 2011.

· S. Chakraborty and J. Edmonds, "Bounding Variance and Expectation of Longest Path Lengths in DAGs from Variance and Expectation of Edge Lengths," *SODA, ACM Symp. on Discrete Algorithms*, 2010.

· J. Edmonds, A. Sidiropoulos, and A. Zouzias, "Hardness of Embedding into $\mathcal{R}^2$ with Constant Distortion," *SODA, ACM Symp. on Discrete Algorithms*, 2010.

· J. Edmonds, K. Pruhs, and J. Solanki, "Confidently Cutting a Cake into Approximately Fair Pieces,"

> · *AAIM, Conference on Algorithmic Aspects in Information and Management*, 2008, p. 155-164.
> · Masters thesis under my supervision, 68 pages, 2007.

· J. Edmonds and K. Pruhs, "Balanced Allocations of Cake," *FOCS, Symp. Foundations of Computer Science*, pp. 623-634, 2006.

· S. Davis, J. Edmonds, and R. Impagliazzo, "Online Algorithms To Minimize Resource Reallocations and Network Communication,"

> · *Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques,* Springer pp. 104-115, 2006.
> · *Approx: 9th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems*, pp. 204-219, 2006.

· M. Adler, J. Edmonds, and J. Matoušek, "Towards Asymptotic Optimality in Probabilistic Packet Marking," *STOC, ACM Symp. on Theory of Computing*, pp. 450-459, 2005.

· M. Clegg, J. Edmonds, R. Impagliazzo, "Using the Groebner basis algorithm to find proofs of unsatisfiability," *STOC, ACM Symp. on Theory of Computing*, pp. 174-184, 1996.

Papers in Refereed Conference Proceedings (Submitted to Journals) Cont.:

· N. Alon, J. Edmonds, M. Luby, "Linear Time Erasure Codes with Nearly Optimal Recovery,"

    · Submitted to *IEEE Transactions on Information Theory.*

    · *FOCS, Symp. on Foundations of Comp. Sci.*, pp. 512-519, 1995.

· J. Edmonds, C. K. Poon, "A Nearly Optimal Time-Space Lower Bound for Graph Connectivity Problem on NNJAG Model," *STOC, ACM Symp. on Theory of Computing*, pp. 147-156, 1995.

Books:

· J. Edmonds, "How to Think About Algorithms",

    · Second Addition, increasing the length from 448 to 616, 2026.

    · Cambridge University Press, 2008.

    · Text for CSE 3101.

    · http://www.amazon.com/Think-About-Algorithms-Jeff-Edmonds/dp/0521614104

    · Glowing reviews in *SIGACT News* 2008, *Review in Times Higher Education* 2008, and *York Writes* 2009.

    · Translated into Greek 2016

    · Translated into Portuguese 2011

· Thousands of power point slides for algorithms class. They are getting very good reviews in the class and in the community.

· Chapter "Scheduling with Equipartition" in "Encyclopedia of Algorithms," Springer, Editor Ming-Yang Kao, 2008.

Technical Reports and Abstracts:

· J. Edmonds and K. Pruhs, "Cake Cutting Upper Bound," Wikipeida page, http://en.wikipedia.org/wiki/Edmonds-Pruhs_protocol, 2014

· J. Edmonds and K. Pruhs, "Cake Cutting Lower Bound," Taught at CMU 2014: http://www.cs.cmu.edu/ arielpro/15896/schedule.html, http://www.cs.cmu.edu/ ariel-pro/15896/docs/slides17.pdf pg 14.

· N. Nasser and J. Edmonds, "PBT Framework and BT Reductions," Masters project, 54 pages, 2008.

· A. Borodin, J. Edmonds, and H. Kwon, "Improved Results on Models of Greedy and Primal-Dual Algorithms," Masters thesis under my supervision, 63 pages, 2008.

· J. Edmonds and A. Mirzaian, "Adding Made Easy," Manuscript

· J. Edmonds, S. Datta, P. Dymond, and K. Ali, "RQM: A new rate-based active queue management algorithm." York University Technical Report CSE-2006-09.

Patents:

· J. Gryz, R. Miller, J. Edmonds, D. Liang, "Efficient Determination of Homogeneous Rectangles in a Binary Matrix", 2000. Patented.

· Andres Albanese, Michael Luby, Johannes Blömer and Jeff Edmonds, "Message Encoding and Transmission System and Method for Multilevel Data Redundancy", *U.S. Patent Application*, Serial Number 08/361,802; 12-21-94, Assignment recorded February 27, 1995, Reel 7364, Frames 685-689.

Scholarly and Professional Activities (Invited Talks and/or I invited myself):

- · Wrote an app www.eecs.yorku.ca/∼jeff/flow/ for the kortright.org.
- · Gave two machine learning seminars/talks at York and one at U. of T.
- · Attended 60th birthday celebration of Toniann Pitassi in Berkeley March 26-31.
- · Taught a 30hr Machine Learning zoom course for AIMS masters students in Cameroon, March 2021, 2022 and 2023.
- · Oct-Dec 2022:

    - · Worked at BKAI, a leading artificial intelligence research center in Vietnam.
    - · Taught a course on algorithms
    - · Gave a few lectures on machine learning
    - · Helped organize the 11th International Symposium on Information and Communication Technology in Hanoi Dec 1-3 2022.
    - · Appeared in a newspaper article https://soict.hust.edu.vn/18802.html

- · Monthly machine learning reading group with York grad students 2022-present
- · Gave seven Invited talks for *IEEE Women in Engineering* Nov-Dec 2021.
    https://www.eecs.yorku.ca/∼jeff/courses/machine-learning/
- · *Artificial Intelligence Hive Lassonde, York University.* I have given two talks. https://www.youtube.com/watch?v=vCyQgsjrc9s&feature=youtube
- · African Institute of Mathematical Sciences (AIMS): Taught 7 masters level courses in Ghana, Senegal, Tanzania, and Cameroon, 2015-2016 for three weeks each.
- · Workshop on Proof Complexity: Banff International Research Station 2011
- · Workshop on Scheduling: Dagstule 2010.
- · Workshop on Cake Cutting: Dagstule 2008.
- · Workshop on Scheduling: France 2007.
- · Univ. of Toronto: Every year or two at the theory colloquium
- · York Univ.: Every five years or so at the theory colloquium (too hard to get people to come).
- · Univ. of California at San Diego or Princeton Inst. for Advanced Studies: Every two years or so visiting R. Impagliazzo
- · Planning for my first Sabbatical 2001: CWI Amsterdam, Chennai, Bangalore, TIFR Bombay, IIT Bombay.
- · Early years at York (≈ 1996) Univ. of Waterloo, Hong Kong, McMaster.
- · Late Graduate School or Postdoc (1994): Carnegie Mellon, Univ. of Pittsburgh, Univ. of Washington, Simon Fraser Univ., Univ. of California at Santa Cruz, Emory in Atlanta, Georgia State University.