

Curriculum Vitae

LUCIAN ILIE

1 Personal

- Rank: Associate Professor, full-time, tenured¹
- Address: Department of Computer Science, University of Western Ontario, London, ON, N6A 5B7, Canada, e-mail: ilie@csd.uwo.ca, web: www.csd.uwo.ca/~ilie/
- Citizenship: Canadian

2 Education

- Ph.D. 1999, University of Turku, Finland (supervisor: Acad. Arto Salomaa, Academy of Finland, opponent: Prof. Grzegorz Rozenberg, Leiden University, The Netherlands)

3 Employment history

- Jul. 2005 – present: Associate Professor, Department of Computer Science, University of Western Ontario
- Aug. 2000 – Jun. 2005: Assistant Professor, Department of Computer Science, University of Western Ontario
- Feb. 2010 – present: Adjunct Associate Professor, Department of Computing and Software, McMaster University

4 Awards, Fellowships, and Honours

- **CNRS Visiting Professor**², Centre National de la Recherche Scientifique, Université Paris-Est, France, Sep. 2006 - Jun. 2007³.
- **Faculty Scholar Award**⁴, University of Western Ontario, 2009 – 2011.
- **Award of Excellence**, USC Teaching Honour Roll, University of Western Ontario, 2008 – 2009.
- **Humboldt fellowship**⁵, Magdeburg, Germany, Oct. 2000 – Sep. 2001.
- Postdoctoral Fellow, Turku Centre for Computer Science, Turku, Finland, Feb. 1999 – Dec. 1999.
- Visiting Researcher, Leiden Institute of Advanced Computer Science, Leiden, The Netherlands, 1998. Oct. 1998 – Nov. 1998, Jun. 1998 – Jul. 1998
- My Erdős number is 2 (via either Jeffrey Shallit or Solomon Marcus)

¹ Tenure and promotion obtained one year earlier than expected according to the Collective Agreement. Only two out of seven tenure track professors obtained this. (The other one was Bin Ma, currently at Univ. of Waterloo.)

² The highly selective “poste rouge,” French government-funded senior research fellowship. Awarded based on quality of applicant and research project, most applications receive only 3-6 months.

³ During my sabbatical leave from the University of Western Ontario.

⁴ Awarded “to honour and celebrate outstanding scholarly achievements at a critical point in the career” based on “a recent, outstanding research achievement that has had international impact in the field of research and that identifies the individual as a leading member of that research community.”

⁵ Declined to take up my tenure-track position at the University of Western Ontario.

5 Research interests

Current interests

- Bioinformatics
- String Algorithms

Other interests: String Combinatorics, Mathematical Properties of Strings, Text Processing, Finite Automata for String Processing, Regular Expression Matching, String Complexity, Data Compression

6 Publications⁶

Summary: 90

refereed journals: 49

refereed conferences: 30

referred book chapters: 11

Refereed journals

1. L. Ilie and W.F. Smyth, Minimum unique substrings and maximal repeats, *Fund. Inform.* 110 (1-4) (2011) 183 – 195.
2. M. Crochemore, L. Ilie, C. Iliopoulos, M. Kubica, W. Rytter, and T. Walen, Computing the Longest Previous Factor, *Eur. J. Comb.*, to appear.
3. L. Ilie, S. Ilie, and A. Mansouri Bigvand, SpEED: fast computation of sensitive spaced seeds, *Bioinformatics* 27(17) (2011) 2433 – 2434.
4. L. Ilie, S. Ilie, S. Khoshraftar, and A. Mansouri-Bigvand, Seeds for effective oligonucleotide design, *BMC Genomics* 12 (2011) 280.
5. A. Al-Hafeedh, M. Crochemore, L. Ilie, J. Kopylov, W.F. Smyth, G. Tischler, and M. Yusufu, A comparison of Lempel-Ziv LZ77 factorization algorithms, *ACM Computing Surveys*, accepted.
6. M. Crochemore, L. Ilie, and L. Tinta, The “runs” conjecture, *Theoret. Comput. Sci.* 412(27)(2011) 2931 – 2941.
7. M. David, M. Dzamba, D. Lister, L. Ilie, and M. Brudno, SHRiMP2: Sensitive yet practical short read mapping, *Bioinformatics* 27(7) (2011) 1011 – 1012.
8. L. Ilie, F. Fazayeli, and S. Ilie, HiTEC: accurate error correction in high-throughput sequencing data, *Bioinformatics* 27(3) (2011) 295 – 302.
9. L. Ilie, G. Navarro, and L. Tinta, The Longest Common Extension problem revisited and an application to approximate string searching, *J. Discrete Alg.* 8(4) (2010) 418 – 428.
10. L. Ilie and S. Ilie, Fast computation of neighbour seeds, *Bioinformatics* 25(6) (2009) 822 – 823.
11. M. Crochemore, L. Ilie, and W. Rytter, Repetitions in strings: algorithms and combinatorics, *Theoret. Comput. Sci.* 410(50) (2009) 5227 – 5235.
12. M. Crochemore and L. Ilie, Computing longest previous factor in linear time and applications, *Inform. Proc. Lett.* 106 (2008) 75 – 80.
13. M. Crochemore and L. Ilie, Maximal repetitions in strings, *J. Comput. Syst. Sci.* 74 (2008) 796 – 807.

⁶ The order of authors for theoretical and mathematical papers is alphabetic, following common practice, whereas the order in bioinformatics papers is according to importance of contribution.

14. L. Ilie and S. Ilie, Multiple spaced seeds for homology search, *Bioinformatics* 23(22) (2007) 2969 – 2977.
15. S. Constantinescu and L. Ilie, The Lempel–Ziv complexity of fixed points of morphisms, *SIAM Journal on Discrete Math.* 21(2) (2007) 466 – 481.
16. M. Crochemore, L. Ilie, and E. Seid-Hilmi, The structure of factor oracles, *Internat. J. Found. Comput. Sci.* 18(4) (2007) 781 – 797.
17. L. Ilie, A note on the number of squares in a word, *Theoret. Comput. Sci.* 380(3) (2007) 373 – 376.
18. L. Ilie and C. Popescu, Viral genome compression and shortest common superstring problem, *Fund. Inform.* 73(1-2) (2006) 153 – 164.
19. S. Constantinescu and L. Ilie, Fine and Wilf’s theorem for abelian periods, *Bulletin of EATCS* 89 (2006) 167 – 170.
20. L. Ilie, S. Marcus, and I. Petre, Periodic and Sturmian languages, *Inform. Proc. Lett.* 98(6) (2006) 242 – 246.
21. L. Ilie, A simple proof that a word of length n has at most $2n$ distinct squares, *J. Combin. Theory, Ser. A* 112(1) (2005) 163 – 164.
22. M. Davidson and L. Ilie, Fast data compression with antidictionaries, *Fund. Inform.* 64(1-4) (2005) 119 – 134.
23. L. Ilie, P. Ochem, and J. Shallit, A generalization of repetition threshold, *Theoret. Comput. Sci.* 345(2-3) (2005) 359 – 369.
24. S. Constantinescu and L. Ilie, Generalized Fine and Wilf’s theorem for arbitrary number of periods, *Theoret. Comput. Sci.* 339(1) (2005) 49 – 60.
25. L. Ilie, S. Yu, and K. Zhang, Word complexity and repetitions in words, *Internat. J. Found. Comput. Sci.* 15(1) (2004) 41 – 55.
26. L. Ilie and S. Yu, Follow automata, *Inform. and Comput.* 186(1) (2003), 140 – 162.
27. L. Ilie and S. Yu, Reducing NFAs by invariant equivalences, *Theoret. Comput. Sci.* 306(1-3) (2003) 373 – 390.
28. V. Halava, T. Harju, and L. Ilie, Periods and binary words, *J. Combin. Theory, Ser. A*, 89 (2000) 298 – 303.
29. L. Ilie, Gh. Păun, G. Rozenberg, and A. Salomaa, On strongly context-free languages, *Discrete Appl. Math.* 103 (2000) 153 – 165.
30. L. Ilie and A. Salomaa, On the expressiveness of subset-sum representations, *Acta Inform.* 36 (2000) 665 – 672.
31. L. Ilie, G. Rozenberg, and A. Salomaa, A characterizations of poly-slender context-free languages, *Theoret. Inform. Appl. (RAIRO)* 34 (2000) 77 – 86.
32. L. Ilie, On lengths of words in context-free languages, *Theoret. Comput. Sci.* 242 (2000) 327 – 359.
33. L. Ilie and W. Plandowski, Two-variable word equations, *Theoret. Inform. Appl. (RAIRO)* 34 (2000) 467 – 501.
34. L. Ilie, Subwords and power-free words are not expressible by word equations, *Fund. Inform.* 38 (1999) 109 – 118.
35. L. Ilie and A. Salomaa, 2-Testability and relabelings produce everything, *J. Comput. System Sci.* 56 (1998) 253 – 262.
36. T. Harju and L. Ilie, On quasi orders of words and the confluence property, *Theoret. Comput. Sci.* 200 (1998) 205 – 224.
37. L. Ilie and A. Salomaa, On well quasi orders of free monoids, *Theoret. Comput. Sci.* 204 (1998) 131 – 152.
38. L. Ilie, Generalized factors of words, *Fund. Inform.* 33 (1998) 239 – 247.
39. T. Harju and L. Ilie, Languages obtained from infinite words, *RAIRO, Inform. Théor. Appl.* 31 (1997) 445 – 455.

40. L. Ilie, On computational complexity of contextual languages, *Theoret. Comput. Sci.* 183 (1997) 33 – 44.
41. V. Halava, T. Harju, and L. Ilie, On a geometric problem of zig-zags, *Inform. Process. Lett.* 62 (1997) 1 – 4.
42. L. Ilie, On the computational complexity of Marcus contextual languages, *Fund. Inform.* 30 (1997) 161 – 167.
43. L. Ilie, A new type of self-reading sequences, *Rev. Roumaine Math. Pures Appl.* 42 (1997) 409 – 421.
44. L. Ilie, Some recent results on contextual languages, *Bull. EATCS (The Formal Language Theory Column)* 62 (1997) 176 – 194.
45. L. Ilie, Collapsing hierarchies in parallel communicating grammar systems with communication by command, *Comput. Artificial Intelligence* 15 (1996) 173 – 184.
46. L. Ilie, A non-semilinear language generated by an internal contextual grammar with finite choice, *An. Univ. Bucureşti Mat. Inform.* 45 (1996) 63 – 70.
47. L. Ilie and V. Mitrana, Binary self-adding sequences and languages, *Int. J. Comput. Math.* 62 (1996) 171 – 181.
48. L. Ilie, On subwords of infinite words, *Discrete Appl. Math.* 63 (1995) 277 – 279.
49. L. Ilie, On a conjecture about slender context-free languages, *Theoret. Comput. Sci.* 132 (1994) 427 – 434.

Refereed conferences

50. L. Ilie and L. Tinta, Practical algorithms for the longest common extension problem, in: J. Karlgren, J. Tarhio, and H. Hyyrö (eds.), *Proc. of the 16th International Symposium on String Processing and Information Retrieval (SPIRE'09)*, Lecture Notes in Comput. Sci. 5721, Springer, Heidelberg, 2009, 302 – 309.
51. L. Ilie and S. Ilie, Efficient computation of good neighbour seeds, *17th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB'09) & 8th European Conference for Computational Biology (ECCB'09)*, Stockholm, 2009. (poster).
52. M. Crochemore, L. Ilie, C. Iliopoulos, M. Kubica, W. Rytter, and T. Waleń, LPF computation revisited, in: J. Fiala, J. Kratochvíl, and M. Miller, eds., *Proc. of 20th IWOCA*, Lecture Notes in Comput. Sci. 5874, Springer, Heidelberg, 2009, 158–169.
53. L. Ilie and S. Ilie, Improved algorithms for local alignment, *16th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB'08)*, Toronto, 2008. (poster).
54. M. Crochemore, L. Ilie, and L. Tinta, Towards a solution to the “runs” conjecture, in: P. Ferragina and G. Landau (Eds.), *Proceedings of the 19th Annual Symposium on Combinatorial Pattern Matching (CPM'08)* (Pisa, Italy), Lecture Notes in Comput. Sci. 5029, Springer, Berlin, 2008, 290 – 302.
55. M. Crochemore and L. Ilie, Understanding Maximal Repetitions in Strings, in: S. Albers and P. Weil, eds., *Proceedings of the 25th Symposium on Theoretical Aspects of Computer Science (STACS'08)* (Bordeaux, 2008), <http://drops.dagstuhl.de/opus/volltexte/2008/1344>.
56. M. Crochemore, L. Ilie, and W.F. Smyth, A simple algorithm for computing the Lempel-Ziv factorization, in: J. A. Storer and M. W. Marcellin, eds., *Proc. of the 18th Data Compression Conference (DCC'08)* (Snowbird, Utah, USA), IEEE Computer Society, Los Alamitos, CA, 2008, 482 – 488.
57. L. Ilie and S. Ilie, Fast computation of multiple spaced seeds for homology search, in: R. Giancarlo, S. Hannenhalli, eds., *Proc. of the 7th Workshop on Algorithms in Bioinformatics (WABI'07)* (Philadelphia, 2007), Lecture Notes in Bioinformatics 4645, Springer, Berlin, 2007, 346 – 358.

58. L. Ilie and S. Ilie, Long spaced seeds for homology search, in: H. Arabnia, M.Q. Yang, and J.Y. Yang, eds., *Proc. of the 2007 International Conference on Bioinformatics and Computational Biology (BIOCOMP'07)* (Las Vegas, 2007), Vol. I, CSREA Press, Las Vegas, 2007, 3 – 8.
59. M. Crochemore and L. Ilie, Analysis of maximal repetitions in strings, in: L. Kučera, A. Kučera, eds., *Proc. of The 32nd Mathematical Foundations of Computer Science (MFCS'07)* (Cesky Krumlov, Czech Republic, 2007), Lecture Notes in Comput. Sci. 4708, Springer, Berlin, 2007, 465–476.
60. M. Crochemore, L. Ilie, and E. Seid-Hilmi, Factor oracles, in: O. Ibarra and H.-C. Yen, eds., *Proc. of the 11th International Conference on Implementation and Application of Automata (CIAA'06)* (Taipei, Taiwan, 2006), Lecture Notes in Comput. Sci. 4094, Springer, Berlin, 2006, 78 – 89.
61. S. Constantinescu and L. Ilie, The Lempel–Ziv complexity of fixed points of morphisms, *Proc. of the 31st Mathematical Foundations of Computer Science (MFCS'06)* (Stara Lesna, Slovakia, 2006), Lecture Notes in Comput. Sci. 4162, Springer, Berlin, 2006, 280 – 291.
62. L. Ilie, L. Tinta, C. Popescu, and K. Hill, Viral genome compression, in: C. Mao, T. Yokomori, eds., *Proc. of the 12th International Meeting on DNA Computing (DNA'06)* (Seoul, Korea), Lecture Notes in Comput. Sci. 4287, Springer, Berlin, 2006, 111 – 126.
63. L. Ilie and R. Solis-Oba, Gene assembly algorithms for ciliates, in: C. Mao, T. Yokomori, eds., *Proc. of the 12th International Meeting on DNA Computing (DNA'06)* (Seoul, Korea, 2006), Lecture Notes in Comput. Sci. 4287, Springer, Berlin, 2006, 71 – 82.
64. S. Constantinescu and L. Ilie, The Lempel–Ziv complexity of fixed points of morphisms, *SIAM Conference on Discrete Mathematics* (Victoria, 2006).
65. L. Ilie, A note on the number of distinct squares in a word, in: S. Brlek, C. Reutenauer, eds., *Proc. of the 5th International Conference on Combinatorics on Words (WORDS'05)* (Montreal, 2005), LaCIM 36, Montreal, 2005, 289 – 294.
66. L. Ilie, R. Solis-Oba, and S. Yu, Reducing NFAs by equivalences and preorders, in: A. Apostolico, M. Crochemore, K. Park, eds., *Proceedings of the 16th Annual Symposium on Combinatorial Pattern Matching (CPM'05)* (Jeju island, Korea, 2005), Lecture Notes in Comput. Sci. 3537, Springer, Berlin, 2005, 310 – 321.
67. L. Ilie, P. Ochem, and J. Shallit, A generalization of repetition threshold, in: J. Fiala et al., eds.: *Proceedings of the 29th International Symposium on Mathematical Foundations of Computer Science (MFCS'04)*, (Prague, 2004), Lecture Notes in Comput. Sci. 3153, Springer, Berlin, 2004, 818 – 826.
68. S. Constantinescu and L. Ilie, Fine and Wilf's theorem for any number of periods, in: T. Harju, J. Karhumaki, eds., *Proc. of the 4th International Conference on Combinatorics on Words (WORDS'03)* (Turku, 2003), TUCS General Publication, 27 (2003) 65 – 74.
69. L. Ilie, S. Yu, and Q. Zhao, Introduction to Process Traces, in: H.R. Arabnia and Y. Mun, Eds., *Proc. of the 2003 International Conference on Parallel Distributed Processing Techniques and Applications (PDPTA'03)* (Las Vegas, 2003), CSREA Press, Las Vegas, 2003, 1706 – 1712.
70. L. Ilie, B. Shan, and S. Yu, Fast algorithms for extended regular expression matching and searching, in: H. Alt and M. Habib, eds., *Proceedings of the 20th Symposium on Theoretical Aspects of Computer Science (STACS'03)* (Berlin, 2003), Lecture Notes in Comput. Sci., 2607, Springer, Berlin, 2003, 179 – 190.
71. L. Ilie and S. Yu, Constructing NFAs by optimal use of positions in regular expressions, in: A. Apostolico, M. Takeda, eds., *Proceedings of the 13th Annual Symposium on Combinatorial Pattern Matching (CPM'02)* (Fukuoka, 2002), Lecture Notes in Comput. Sci., 2373, Springer, Berlin, 2002, 279 – 288.
72. L. Ilie, S. Yu, and K. Zhang, Repetition complexity of words, in: O. Ibarra, L. Zhang, eds., *Proceedings of the 8th Annual International Computing and Combinatorics Conference (CO-*

- COON'02*) (Singapore, 2002), Lecture Notes in Comput. Sci., 2387, Springer, Berlin, 2002, 320 – 329.
73. L. Ilie and S. Yu, Algorithms for computing small NFAs, in: K. Diks, W. Rytter, eds., *Proceedings of the 27th International Symposium on Mathematical Foundations of Computer Science (MFCS'02)*, (Warszawa, 2002), Lecture Notes in Comput. Sci., 2420, Springer, Berlin, 2002, 328 – 340.
 74. L. Ilie and W. Plandowski, Two-variable word equations, in: H. Reichel, S. Tison, eds., *Proc of the 17th Symposium on Theoretical Aspects of Computer Science (STACS'00)* (Lille, 2000), Lecture Notes in Comput. Sci., 1770, Springer, Berlin, 2000, 122 – 132.
 75. L. Ilie, An attempt to define a class of mildly context-sensitive languages, in: A. Ádám, P. Dömösi, eds., *Proceedings of the 8th International Conference on Automata and Formal Languages (ICAF'99)* (Salgotarjan, 1996), *Publ. Math. Debrecen* 54 (1999) 865 – 876.
 76. L. Ilie, Remarks on well quasi orders of words, in: S. Bozapalidis, ed., *Proceedings of the 3rd Developments in Language Theory Conference (DLT'98)* (Thessaloniki, 1997), Aristotle Univ. of Thessaloniki, 1998, 399 – 411.
 77. L. Ilie, On ambiguity in internal contextual languages, in: C. Martin-Vide, ed., *Mathematical and computational analysis of natural language* (Tarragona, 1996), Benjamins, Amsterdam, 1998, 29 – 45.
 78. L. Ilie, On disjunctivity, ultimate periodicity, and ultimate identity of Păun-Salomaa self-reading sequences, in: J. Dassow, G. Rozenberg, A. Salomaa, eds., *Proceedings of the 2nd Developments in Language Theory Conference (DLT'95)* (Magdeburg, 1995), World Sci. Publishing, River Edge, NJ, 1996, 44 – 53.
 79. L. Ilie and A. Salomaa, On regular characterizations of languages by grammar systems, in: E. Csuhaj-Varju, ed., *Grammar systems: recent results and perspectives* (Budapest 1996), *Acta Cybernet.* 12 (1996) 411 – 425.

Refereed book chapters

80. L. Ilie, *Regular Expression Matching*, in: Ming-Yang Kao, ed., *Encyclopedia of Algorithms*, Springer, New York, 2008, 768 – 771.
81. L. Ilie, Combinatorial complexity measures for strings, *Recent Advances in Formal Languages and Applications*, Springer-Verlag, Berlin, Heidelberg, 2006, 149 – 170.
82. L. Ilie, G. Navarro, and S. Yu, On NFA reductions, in: J. Karhumaki, H. Maurer, G. Paun, G. Rozenberg, eds., *Theory is Forever* Lecture Notes in Comput. Sci. 3113, Springer-Verlag, Berlin, Heidelberg, 2004, 112 – 124.
83. L. Ilie and V. Mitrana, Crossing-over on languages: a formal representation of chromosomes recombination, in C. Martin-Vide et al., eds., *Grammars and Automata for String Processing: From Mathematics and Computer Science to Biology, and Back*, Taylor and Francis, London, 2003, 391-401.
84. L. Ilie, S. Yu, K. Zhang, Repetition complexity of words, invited lecture, in: J. Dassow, M. Hoeberechts, H. Jürgensen, D. Wotschke, eds., *Preproc. of Descriptive Complexity of Formal Systems (DCFS)*, (London, 2002).
85. T. Harju and L. Ilie, Forbidden subsequences and permutations sortable on two parallel stacks, in: C. Martin-Vide et al., eds., *Where Mathematics, Computer Science, Linguistics, and Biology Meet*, Kluwer, Dordrecht, 2001, 267 – 275.
86. L. Ilie, On generalized slenderness of languages, in: M. Ito, Gh. Păun, S. Yu, eds. *Words, Semigroups, and Transductions*, World. Sci. Publ., Singapore, 2001, 189 – 202.
87. L. Ilie, I. Petre, and G. Rozenberg, Uniformly scattered factors, in: C. Calude, Gh. Păun, eds., *Finite Versus Infinite. Contributions to an Eternal Dilemma*, Springer-Verlag, London, 2000, 187 – 198.

88. L. Ilie, The decidability of the generalized confluence problem for context-free languages, in, Gh. Păun, A. Salomaa, eds., *New Trends in Formal Languages. Control, Cooperation, and Combinatorics*, Lecture Notes in Comput. Sci., 1218, Springer-Verlag, Berlin, New York, 1997, 454 – 464.
89. A. Ehrenfeucht, L. Ilie, Gh. Păun, G. Rozenberg, and A. Salomaa, On the generative capacity of some classes of contextual grammars, in: Gh. Păun, ed., *Mathematical Linguistics and Related Topics*, Ed. Acad. Române, Bucharest, 1995, 105 – 118.
90. L. Ilie, On contextual grammars with parallel derivation, in: Gh. Păun, ed., *Mathematical Aspects of Natural and Formal Languages*, World Sci. Publishing, Singapore, 1994, 165 – 172.

7 Research funding

1. MITACS Seed Project, PI: M. Brudno (UofT), 3 members
 - title: *Assembly and Analysis of 2-base Encoded Sequencing Data*
 - amount: **\$80,000** for two years (2011 – 2013)
 - non-academic participants: Applied Biosystems, Ontario Institute for Cancer Research, Hospital for Sick Children (Sick Kids)
2. NSERC discovery grant, individual
 - title: *Combinatorial Algorithms for Approximate String Searching and DNA Sequencing*
 - amount: **\$125,000** for five years (2010 – 2015)
3. MITACS Accelerate Internship, one co-PI
 - title: *Wheat Sequence Variation Prediction by Peptide Mass Spectra*
 - amount: **\$15,000** for four months (Sep. 2009 – Dec.2009)
 - non-academic participant: NeoVentures Biotechnology Inc.
4. Faculty Scholar Award, University of Western Ontario
 - amount: **\$14,000** for two years (2009 – 2011)
5. NSERC discovery grant, individual
 - title: *Strings, Finite Machines, and Applications*
 - amount: **\$105,000** for five years (2005 – 2010).
6. NSERC individual grant
 - title: *Combinatorics on Words and Languages*
 - amount: **\$72,000** for four years (2001 – 2005).
7. Start-up grant (Sep. 2000)
 - amount: **\$25,000**

8 Other scholarly and professional activities

8.1 Conferences and Talks

- **invited lecture** – McMaster University, 2011
- **invited lecture** – 3rd biennial Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), Victoria, 2011
- **invited lecture** – McMaster University, 2009
- **invited lecture** – 7th International Conference on Combinatorics on Words (WORDS), Salerno, Italy, 2009.
- 16th International Symposium on String Processing and Information Retrieval (SPIRE), Saariselkä, Finland, 2009

- 17th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB) & 8th European Conference for Computational Biology (ECCB), Stockholm, 2009
- 20th International Workshop on Combinatorial Algorithms (IWOCA), Czech Republic, 2009
- 16th Annual International Conference Intelligent Systems for Molecular Biology (ISMB), Toronto, 2008
- **invite lecture** – Waterloo University, 2008
- 19th Annual Symposium on Combinatorial Pattern Matching (CPM), Pisa, Italy, 2008
- 18th Data Compression Conference (DCC), Snowbird, Utah, USA
- **invited lecture** 25th Symposium on Theoretical Aspects of Computer Science (STACS), Bordeaux, France, 2008
- 7th Workshop on Algorithms in Bioinformatics (WABI), Philadelphia, USA, 2007
- the 2007 International Conference on Bioinformatics and Computational Biology (BIOCOMP), Las Vegas, USA, 2007
- **invited lecture** – AutoMathA 2007, Palermo, Italy, 2007
- 32nd Mathematical Foundations of Computer Science (MFCS), Cesky Krumlov, Czech Republic, 2007
- **invited lecture** – Workshop on Algorithms on Words, Turku, Finland, 2007
- **invited lecture** – London Stringology Day and London Algorithmic Workshop (LSD + LAW) 2007, King’s College, London, UK, 2007
- **invited lecture** – Journées du GDR Informatique Mathématique, Institut Henri Poincaré, Paris, 2007
- **invited lecture** – Laboratoire d’Informatique Algorithmique: Fondements et Applications UMR 7089, CNRS et Université Paris 7, France, 2007
- **invited lecture** – Marne-la-Vallée University, France, 2006
- **invited lecture** – SCRA 2006, Portugal
- 6th PhD School, Tarragona, Spain, 2006
- SIAM Conference on Discrete Mathematics, Victoria, 2006.
- 11th International Conference on Implementation and Application of Automata (CIAA), Taipei, 2006
- 31st International Symposium on Mathematical Foundations of Computer Science (MFCS), Stara Lesna, Slovakia, 2006
- 12th International Meeting on DNA Computing (DNA), Seoul, 2006
- **invited lecture** – McMaster University 2006, Combinatorial complexity measures for strings
- 5th PhD School, Tarragona, Spain, 2005
- 5th International Conference on Combinatorics on Words (WORDS), Montreal, 2005
- 16th Annual Symposium on Combinatorial Pattern Matching (CPM), Jeju island, South Korea, 2005
- 29th International Symposium on Mathematical Foundations of Computer Science (MFCS), Prague, 2004
- 4th International Conference on Combinatorics on Words (WORDS), Turku, 2003.
- International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA), Las Vegas, 2003.
- 20th Symposium on Theoretical Aspects of Computer Science (STACS), Berlin, Germany, 2003
- **invited lecture** – 4th Descriptive Complexity of Formal Systems (DCFS), London, 2002
- 27th International Symposium on Mathematical Foundations of Computer Science (MFCS), Warszawa, 2002
- 8th Annual International Computing and Combinatorics Conference (COCOON), Singapore, 2002
- 13th Annual Symposium on Combinatorial Pattern Matching (CPM), Fukuoka, Japan, 2002

- **invited lecture** – The University of Western Ontario 2000, On fast word algorithms
- 17th Symposium on Theoretical Aspects of Computer Science (STACS), Lille, France, 2000
- **invited lecture** – University of Turku 1999, Periods and binary words
- **invited lecture** – University of Turku 1999, The Critical Factorization Theorem
- **invited lecture** – University of Leiden 1998, Orders of words
- 3rd Developments in Language Theory Conference (DLT), Thessaloniki, Greece, 1997
- **invited lecture** – University of Frankfurt 1996, Recent results on contextual languages
- Workshop on Grammar Systems, Budapest, Hungary, 1996
- 1st German Conference on Bioinformatics (GCB), Leipzig, Germany, 1996
- 8th International Conference on Automata and Formal Languages (ICAF), Salgotarjan, Hungary, 1996
- 2nd International Conference on Mathematical Linguistics (ICML), Tarragona, Spain, 1996.
- **invited lecture** – University of Turku 1995, Languages of infinite words
- 2nd Developments in Language Theory Conference (DLT), Magdeburg, Germany, 1995
- **invited lecture** – University of Turku 1994, Self-reading sequences

8.2 Conference committees

- Program Committee member, Workshop on Algorithmic Analysis of Biological Data (WAABD'11), October 21, Pisa, Italy.
- Program Committee member, 18th Symposium on String Processing and Information Retrieval (SPIRE'11), October 17-21, 2011, Pisa, Italy.
- Program Committee member, 15th International Conference on Implementation and Application of Automata (CIAA'10), August 12-15, Winnipeg, Canada.
- Program Committee member, 14th Developments in Language Theory (DLT'10), Aug.17-20, London, Canada.
- Program Committee member, 14th International Conference on Implementation and Application of Automata (CIAA'09), 14-17th July, Sydney, Australia.
- Program Committee member, 7th International Conference on Combinatorics on Words (WORDS'09), Salerno, Italy, 2009.
- Program Committee member, 3rd International Conference on Language and Automata Theory and Applications (LATA'09), 2009, Tarragona, Spain.
- Program Committee member, 13th International Conference on Implementation and Application of Automata (CIAA'08), July 21-24, 2008, San Francisco, US.
- Program Committee member, 10th Workshop on Descriptive Complexity of Formal Systems (DCFS'08), Charlottetown, Prince Edward Island, Canada, on July 16-18, 2008.
- Program Committee member, 14th Symposium on String Processing and Information Retrieval (SPIRE'07), October 29-31, 2007, Santiago, Chile.
- Program Committee member, 1st International Conference on Language and Automata Theory and Applications (LATA'07), March 29 - April 4, 2007, Tarragona, Spain.
- Program Committee member, 9th Workshop on Descriptive Complexity of Formal Systems (DCFS'07), July 20 - 22, High Tatras, Slovakia, 2007.
- Program Committee member, Language Theory in Biocomputing Workshop (satellite to Unconventional Computation, UC'07), Kingston, Canada, 2007.
- Program Committee member, 11th Developments in Language Theory (DLT'07), July 2007, Turku (Finland).
- Program Committee member, Workshop on Words and Automata (WoWA'06), June 7, 2006, St. Petersburg (Russia).
- Program Committee member, 12th Symposium on String Processing and Information Retrieval (SPIRE'05), November 2-4, 2005, Buenos Aires, Argentina.

- Steering Committee member, Descriptive Complexity of Formal Systems (DCFS), 2005 –
- Program Committee member, 7th Workshop on Descriptive Complexity of Formal Systems (DCFS'05), Como, Italy, June 30 - July 2, 2005.
- Organizing Committee Chair, 6th Workshop on Descriptive Complexity of Formal Systems (DCFS'04), July 26-28, 2004, London, Ontario.
- Program Committee Chair, 6th Workshop on Descriptive Complexity of Formal Systems (DCFS'04), July 26-28, 2004, London, Ontario.

8.3 Journal editorship

- Reviewer for *Mathematical Reviews*.
- Member of the Editorial Board, *International Journal of Computer Mathematics*, 2005 – 2008.
- Guest Editor (with G. Rozenberg, A. Salomaa, K. Salomaa) special issue of *Theoretical Computer Science* 410 (24-25) (2009), volume dedicated to Sheng Yu.
- Guest Editor (with D. Wotschke) of a special issue of *International Journal of Foundations of Computer Science* 16(5) (2005) 829 – 830.
- Editor (with D. Wotschke) of *Proc. of DCFS'04*, Dept. Comput. Sci., UWO, Technical Rep. 619, 2004.

8.4 Reviewer

Journals

- Bioinformatics
- BMC Bioinformatics
- BMC Research Notes
- Journal of Computer and System Sciences
- SIAM Journal on Computing
- Information and Computation
- Information Processing Letters
- Theoretical Computer Science
- Acta Informatica
- Theoretical Informatics and Applications (RAIRO)
- Discrete Applied Mathematics
- Discrete Mathematics
- Fundamenta Informaticae
- International Journal of Foundations of Computer Science
- Acta Cybernetica
- Journal of Automata, Languages, and Combinatorics
- Journal of Parallel and Distributed Computing
- Natural Computing

Conferences

- Annual Symposium on Combinatorial Pattern Matching (CPM)
- Data Compression Conference (DCC)
- International Symposium on Theoretical Aspects of Computer Science (STACS)
- International Colloquium on Automata, Languages, and Programming (ICALP)
- International Symposium on Mathematical Foundations of Computer Science (MFCS)
- International Conference on Implementation and Applications of Automata (CIAA)

- Symposium on String Processing and Information Retrieval (SPIRE)
- Foundations of Software Science and Computation Structures (FOSSACS)
- IBM Centre for Advanced Studies Conference (CASCON)
- International Colloquium on Words, Languages, and Combinatorics (ICWLC)
- International Conference on Developments in Language Theory (DLT)
- International Symposium on Fundamentals of Computation Theory (FCT)
- International Workshop on Descriptive Complexity of Formal Systems (DCFS)
- Latin American Theoretical INformatics (LATIN)
- Workshop on Algorithm Engineering and Experiments (ALENEX)
- Foundations of Software Technology and Theoretical Computer Science (FSTTCS)
- International Frontiers of Algorithmics Workshop (FAW)
- International Conference on Algorithmic Aspects of Information and Management (AAIM)

8.5 Memberships in Professional Organizations

- ISCB (International Society for Computational Biology)
- ACM, SIGACT (Association for Computing Machinery, Special Interest Group on Algorithms and Computation Theory)
- EATCS (European Association for Theoretical Computer Science)

Past memberships

- IEEE, Computer Society (Institute of Electrical and Electronics Engineers, Computer Society)
- IACR (International Association for Cryptologic Research)

8.6 Grant reviewer

- ISF (Israel Science Foundation)
- NSERC (Natural Sciences and Engineering Research Council of Canada)
- NWO (The Netherlands Organization for Scientific Research)

8.7 Miscellaneous

- Teaching “String Complexity” at the 4th International PhD school, Tarragona, Spain, 2005.
- Teaching “String Complexity and applications” at the 5th International PhD school, Tarragona, Spain, 2006.
- Examiner – the 5th International PhD school, Tarragona, Spain, 2006.

9 Teaching

9.1 Undergraduate Courses

Bioinformatics Tools and Applications, Data Structures and Algorithms, Programming Languages, Cryptography and Security.

9.2 Graduate Courses

High-Throughput DNA Sequencing, Biological Sequence Analysis, Bioinformatics Tools and Applications, String Algorithms, String Complexity, Approximate String Algorithms and Applications, Finite Automata and Applications, Combinatorics on Words, Current Problems on Words and Automata.

9.3 Curriculum Development and Course Design

CS413/634 - Cryptography and Security – new course. I have proposed this new course and it turned out to be very successful; in the first year 43 undergraduate students and 7 graduate students attended; it has been introduced in the calendar with its own name and number.

I have completely designed it. I provide **100 pages of course notes**⁷, totally written by myself in L^AT_EX(10pt font, very large text body). It was challenging to find a way to present quite a number of rather deep results from various areas of Mathematics and Computer Science (including number theory, finite fields, probabilities, information theory, algorithms, complexity theory, information theory), which are essential for understanding Cryptography, to Computer Science students. The basic idea was to understand Cryptography and not to simply present various cryptosystems. I started essentially from scratch and presented the concepts in a very easy to understand manner. Gradually, I could help the students grasp even the most difficult parts of the material. I have chosen an interesting but not very deep text book which students could read by themselves; the depth I intended to achieve was provided in my course notes and explained in class.

The assignments and projects were built such that they tested all aspects investigated: theory, applications, and practical implementations. According to the evaluations, it worked.

CS342 - Programming Languages. I have redesigned this course. In the functional and logic programming part, I tried to make clear the connection between underlying theory and actual programming languages. I had to compile a number of sources to build good lecture notes. I provide **360 new slides**⁸, all written by myself in L^AT_EX.

CS8xx courses. Each year I teach a new highest level graduate course; see above. I always try to present top level research so that it is accessible for a wide audience. Because of that, my courses are very popular among students; Approximate String Algorithms and Applications had 27 graduate students attending. The assignments and projects are very research oriented.

CS9601 – Analysis of Biological Sequences. Probabilistic models are fundamental in the analysis of huge amounts of data produced at an increasingly fast rate. The course provides an introduction to core topics in this area, such as: statistical analysis of pairwise alignments, statistical analysis of one and many DNA sequences, whole genome shotgun sequencing – algorithms and statistical analysis, Markov chains and hidden Markov models, profile HMMs for sequence families (applications to modelling protein families, multiple sequence alignment), algorithms for gene prediction, etc. An introduction to the necessary background in probability, statistics, and biology is also provided. I have written **309 new slides**⁹ for this course.

It is very interesting to put Computer Science, Biology, and Statistics together in a coherent manner. This course has attracted students from two departments outside Computer Science.

9.4 Graduate supervision

- Susan Khor, Postdoctoral Fellow
- Nasim Samei, M.Sc.
- Mike Molnar, M.Sc.
- Bahlul Haider, Ph.D.
- Lankesh Shivanna, M.Sc.

⁷ www.csd.uwo.ca/~ilie/CS4413lecturenotes.pdf

⁸ www.csd.uwo.ca/~ilie/CS342lecturenotes.pdf

⁹ www.csd.uwo.ca/~ilie/CS9601lecturenotes.pdf

- Hamid Mohamadi, M.Sc. (McMaster University)
- Mike Molnar, Undergraduate (2011: Software Tools for Genome Assembly)
- Zhewei Liang, M.Sc. (2011: Efficient Algorithms for Local Forest Similarity)
- Farideh Fazayeli, M.Sc. (2011: Error Correction in High Throughput Sequencing Data)
- Shima Khoshraftar, M.Sc. (2010: Oligonucleotide Design)
- Anahita Mansouri, M.Sc. (2010: Spaced Seeds for Similarity Search)
- Jonathan Cable, Undergraduate (2010: Software for peptide databases)
- Emine Seid-Hilmi, Ph.D. (Factor oracles and applications to whole genome alignment)
- Liviu Tinta, Ph.D. (2009: String Repetitions: Combinatorics and Algorithms)
- Sorin Constantinescu, Ph.D. (2007: Repetitions and periods of strings)
- Cristian Popescu, M.Sc. (2005: Viral DNA compression)
- Emine Seid-Hilmi, M.Sc. (fast tracked to Ph.D.)
- Liviu Tinta, M.Sc. (fast tracked to Ph.D.)
- Cerasela Toba, M.Sc. (2005: DNA self assembly)
- Sorin Constantinescu, M.Sc. (fast tracked to Ph.D.)
- Mike Davidson, M.Sc. (2003: Data compression with antidictionaries)
- Baozhen Shan, M.Sc. (2002: Fast algorithms for extended regular expression searching)
- Man Yuan, M.Sc. (2002: Comparing implementations of regular expressions by NFAs)
- Denby Wong, M.Sc. (2001: Finite automata with counters)

9.5 Outreach

I have personally recruited all my students except for the first three (the bottom of the list)¹⁰.

9.6 Examiner

- 25 MSc theses
- 15 PhD theses
- 5 external PhD theses

10 Administrative duties

10.1 Faculty of Science Committees

2005 – 2006:

- Member of the Faculty of Science Nominating Committee

10.2 Department of Computer Science Committees

2000 – 2001

- Member of the Awards Committee

2001 – 2002

- Chair of the Awards Committee

– Achievements as Chair of the Awards Committee:

1. Haining Liang – Honorable Mention in the Computing Research Association’s Outstanding Undergraduate Award for 2002 (there were only two for the whole Canada).

¹⁰ Sorin Constantinescu obtained the only international OGS scholarship in our department ever. There are only 60 such scholarships each year in all disciplines in Ontario

- 2. Lila Kari – Florence Bucke Prize.
- 3. Stephen Watt – CANARIE IWAY Award in the category of New Technology Development.
- 4. Stephen Watt – Distinguished Research Professorship.
- Member of the Graduate Executive Committee
- Member of the Resource Planning Committee
- Member of the Curriculum Committee
- Ph.D. comprehensive exam - prepared and marked questions for
 - Programming Languages
- 2002 – 2003**
- Chair of the Awards Committee
- **Achievements as Chair of the Awards Committee:**
 - 1. Richard Tichy – Honorable Mention in the Computing Research Association’s Outstanding Undergraduate Award for 2003 (there were only eight for the whole Canada).
 - 2. Sorin Constantinescu – Faculty of Science Teaching Assistant Award
- Member of the Appointments Committee
- Member of the PhD Comprehensive Exam Committee
- Ph.D. comprehensive exam - prepared and marked questions for
 - Programming Languages
 - Theory of Computing
- 2003 – 2004**
- Member of the Appointments Committee
- Member of the Graduate Executive Committee
- Member of the PhD Comprehensive Exam Committee
- Member of the Workload Committee
- 2004 – 2005**
- Member of the Appointments Committee
- Member of the Graduate Executive Committee
- Member of the PhD Comprehensive Exam Committee
- 2005 – 2006**
- Member of the Appointments Committee
- Member of the Graduate Executive Committee
- Member of the PhD Comprehensive Exam Committee
- 2007 – 2009**
- **Graduate Chair**
- **Achievements as Graduate Chair (in addition to common duties):**
 - 1. I have created the Research Seminar of the Computer Science Department.
 - 2. I have initiated the faculty-graduate students common lounge.
 - 3. I have obtained extra funding from Faculty of Science for 7 graduate students.
 - 4. I have implemented the OCGS requirements regarding cross-listed courses and now our graduate program’s classification is “Good Quality.”
 - 5. Declining undergraduate enrolment created serious financial problems for the graduate program. I have obtained support from Faculty of Science and, as a consequence, our graduate enrolment increased.
- Member of the Department Executive Committee
- Chair of the Graduate Executive Committee
- Member of the Graduate Awards Committee
- Chair of the PhD Comprehensive Exam Committee
- Chair of the Graduate Scholarships Committee
- 2009 – 2010**
- Member of the Awards and Scholarships Committee

- Member of the PhD Comprehensive Exam Committee
2010 – 2011
- Chair of the Awards and Scholarships Committee
 - **Achievements as Chair of the Awards Committee:**
 1. Stephen Watt – Distinguished University Professor
 2. Ben Shirley – Honorable Mention in the Computing Research Association’s Outstanding Undergraduate Award for 2010.
- Chair of the Awards Committee
- Member of the Student Competitions Committee
- Member of the Appointments Committee