

CURRICULUM VITÆ

Sheng Yu

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EDUCATION

- 1982–1986 Ph.D in Computer Science at the Department of Computer Science, University of Waterloo, Waterloo, Ontario, Canada. Supervisor: Professor Karel Culik II.
- 1980–1982 M.Math in Computer Science at the Department of Computer Science, University of Waterloo, Waterloo, Ontario, Canada. Supervisor: Professor John C. Beatty.

EXPERIENCE

- 1998 – Full Professor at the Department of Computer Science, The University of Western Ontario.
- 1992 – 1998 Associate Professor at the Department of Computer Science, The University of Western Ontario.
- 1989 – 1992 Assistant Professor at the Department of Computer Science, The University of Western Ontario.
- 1987 – 1991 Assistant Professor at the Department of Mathematics and Computer Science, Kent State University. (On leave 1989 – 1991)
- 1986 – 1987 Post-doctoral fellow at the Department of Computer Science, University of Waterloo.
- 1986 – 1986 Visiting Scientist at the Department of Mathematics, University of Turku, Finland, sponsored by the Finnish Science Academy.

PERSONAL INFORMATION:

Citizen of Canada

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS:

ACM, EATCS

RESEARCH INTERESTS

Automata and formal language theory, implementation of automata, object-oriented analysis and design, programming languages, in particular, object-oriented programming languages and parallel programming languages.

MEMBER OF THE EDITORIAL BOARDS OF INTERNATIONAL JOURNALS:

1. *International Journal of Foundations of Computer Science*
2. *Fundamenta Informaticae*
3. *Engineering Letters*
4. *Journal of Universal Computer Science*

CONFERENCE PROGRAM COMMITTEES ETC.:

1. Member of the steering committee of CIAA (International Conference on Implementation and Application of Automata) conference series since 1996 and Chair since 2001.
2. Member of the steering committee of DLT (Development in Language Theory) conference series since 2005.
3. Program committee chair and Organizing committee chair of DLT 2010.
4. Council member of the European Association for Theoretical Computer Science (EATCS) 1997-2003.
5. Program committee member of FCT'99 (Foundations of Computing Theory), DLT'99 (Development in Language Theory), CIAA 2001, CIAA 2002, DLT'02, CIAA 2003, DLT'03, CIAA 2004, DCFS'04, DLT'04, CIAA 2005, FSMNLP 2005, DLT'06, DCFS'06, CIAA 2006, DCFS 2007, CIAA 2007, FSMNLP 2008 (Finite-State Methods and Natural Language Processing), DLT 2008, CIAA 2008, CAI 2009 (International Conference on Algebraic Informatics), CIAA 2009, FSMNLP 2009, CIAA 2010, ICGI 2010 (10th International Colloquium on Grammatical Inference), DLT 2010, DCFS 2010, NCMA 2010 (International Workshop on Non-Classical Models of Automata and Applications), CIAA 2011, DCFS 2011, and several other conferences.
6. Member of program committee and chair of *Half Century of Automata Theory* event, July 2000.
7. Program committee chair of CIAA 2000 and co-chair of CIAA 2004.
8. Program committee co-chair and Organization Committee co-chair of the International Workshop on Implementing Automata 1996 and 1997 (WIA'96 and WIA'97).

THESIS AND ESSAY

1. *On Systolic Automata*, Ph.D. Dissertation, 1986, University of Waterloo. Supervisor: Karel Culik II.
2. *Efficient Methods for Computing LALR(1) Lookahead*, Master Essay, May 1982, also Research Report CS-82-53, Department of Computer Science, University of Waterloo. Supervisor: John C. Beatty.

RESEARCH GRANTS OBTAINED

1. NSERC Discovery Grant, "State Complexity", \$30,000 per year April 2007 - March 2012.
2. NSERC Research Grant, "New Directions in Automata and Formal Language Theory", \$32,000 per year, April 2002 - March 2007.
3. NSERC Research Grant, "New Directions in Automata and Formal Language Theory", \$32,000-\$36,900 per year, April 1998 - March 2002.
4. NSERC Research Grant, "Automata and Formal Languages", \$30,000 per year, April 1994 - March 1998.
5. NSERC (Natural Science and Engineering Research Council of Canada) Strategic Grant, "Symbolic Manipulation of Language Theory Objects", as the Principal Investigator (Co-Investigator: D. Wood), \$133,000, per year (\$399,000 in total), Jan. 1995 - Dec. 1997, extended to Nov. 1, 1998.
6. U.W.O. Academic Development Fund, "DNA Computing", as the PI (Co-I: L. Kari and G. Gloor), \$31,000, 1997.

7. Internal NSERC General Research Grant, U.W.O, "Image compression with weighted automata", \$7,300, 1995.
8. NSERC Operating Grant, "Cellular Automata", \$32,000 per year (\$96,000 in total), April 1991 - March 1994.
9. Internal NSERC General Research Grant, U.W.O, "ParC: A Practical Parallel Programming Languages", \$7,500, June 1990 - March 1991.
10. NSERC Equipment Grant, "Parallel Computer System", as the P.I. (Co-I: Bauer, Bennett, Culik, Webber, and Zhang), \$72,422, 1992.
11. NSERC Operating Grant, "Cellular Automata", \$21,940 per year (\$43,880 in total), April 1989 - March 1991.
12. Summer Research Award, Kent State University, \$5,000, June 1989 - July 1989.

PUBLICATIONS

Papers in refereed journals:

1. "State complexity of combined operations with two basic operations", by B. Cui, Y. Gao, L. Kari, S. Yu, *Theoretical Computer Science*, accepted.
2. "Transition complexity of incomplete DFAs", by Y. Gao, K. Salomaa, S. Yu, *Fundamentae Informatica* 110 (1-4) (2011) 143-158.
3. "State complexity of two combined operations: catenation-union and catenation-intersection", by B. Cui, Y. Gao, L. Kari, S. Yu, *International Journal of Foundations of Computer Science*, accepted.
4. "State Complexity of Union of Star and Intersection of Star", by Y. Gao, L. Kari, S. Yu, *Theoretical Computer Science*, accepted.
5. "State complexity of two combined operations: catenation-star and catenation-reversal", by B. Cui, Y. Gao, L. Kari, S. Yu, *International Journal of Foundations of Computer Science*, accepted.
6. "Subword Occurrences, Parikh Matrices and Lyndon Images", by A. Salomaa and S. Yu, *International Journal of Foundations of Computer Science* (2010), 21 (1) 91-111.
7. "On implementing Recognizable Transductions", by S. Konstantinidis, N. Santean, S. Yu, *International Journal of Computer Mathematics*, 87(2) 260-277, 2010.
8. "Deciding determinism of caterpillar expressions", by K. Salomaa, S. Yu, J. Zan, *Theoretical Computer Science* (2009), 410 (37) 3438-3446.
9. "Hierarchy and equivalence of multi-letter quantum finite automata", by D. Qiu and S. Yu, *Theoretical Computer Science* (2009), 410(30-32) 3006-3017.
10. "Estimation of State Complexity of Combined Operations", by Z. Esik, Y. Gao, G. Liu, S. Yu, *Theoretical Computer Science* (2009), 410(35) 3272-3280.
11. "Variants of codes and indecomposable languages" by A. Salomaa, K. Salomaa, S. Yu, *Information and Computation*, 207 (11) (2009) 1340-1349.
12. "The State Complexity of Two Combined Operations: Star of Catenation and Star of Reversal" by Y. Gao, K. Salomaa, S. Yu, *Fundamenta Informaticae* vol. 83, no. 1-2 (2008) 75-89.

13. "State Complexity of Basic Language Operations Combined with Reversal", by G. Liu, C. Martin-Vide, A. Salomaa, S. Yu, *Information and Computation* 206 (9-10) (2008) 1178-1186.
14. "On the Existence of Prime Decompositions", by Y.-S. Han, A. Salomaa, K. Salomaa, D. Wood, S. Yu, *Theoretical Computer Science*, 376 (1-2) (2007) 60-69.
15. "A Family of NFAs Free of State Reductions", by C. Campeanu, N. Santean, S. Yu, *Journal of Automata, Languages and Combinatorics* 12 (1-2) (2007) 69-78.
16. "State Complexity of Combined Operations", by A. Salomaa, K. Salomaa, S. Yu, *Theoretical Computer Science* 383 (2007) 140-152.
17. "SC-Expressions in Object-Oriented Languages", by S. Yu and Q. Zhao, *International Journal of Foundations Computer Science* vol. 18, no. 6 (2007) 1441-1452.
18. "Fuzzification of Rational and Recognizable Sets" by S. Konstantinidis, S. Nicolae, S. Yu, *Fundamenta Informaticae* vol. 76, no. 4 (2007) 413-447.
19. "On the state complexity of combined operations and their estimation", by K. Salomaa and S. Yu, *International Journal of Foundations of Computer Science*, Vol. 18, No. 4 (2007) 683-698.
20. "Representation and Uniformization of Algebraic Transducers", by S. Konstantinidis, N. Santean, S. Yu, *Acta Informatica*, 76 (4) (2007) 413-447.
21. "Nondeterministic Bimachines and Rational Relations with Finite Codomain", by N. Santean and S. Yu, *Fundamenta Informaticae* 73 (2006) 237-264.
22. "Subword Conditions and Subword Histories", by A. Salomaa and S. Yu, *Information and Computation* 204 (2006) 1741-1755.
23. "Type Theory and Language Constructs for Objects with States", by H. Xu and S. Yu, *Electronic Notes in Theoretical Computer Science*, <http://dx.doi.org/10.1016/j.entcs.2005.09.028>, Elsevier 2006.
24. "State Complexity: Recent Results and Open Problems", by S. Yu, *Fundamenta Informaticae* vol. 64, no. 1-4 (2005) 471-480.
25. "Mergible States in Large NFA", by C. Câmpeanu, N. Sântean, S. Yu, *Theoretical Computer Science* 330 (2005) 23-34.
26. "Pattern Expressions and Pattern Languages" by C. Câmpeanu and S. Yu, *Information Processing Letters* 92 (2004) 267-274.
27. "On the state complexity of reversals of regular languages", by A. Salomaa, D. Wood, and S. Yu, *Theoretical Computer Science* 320 (2004) 293-313.
28. "Subword history and Parikh matrices", by A. Mateescu, A. Salomaa, S. Yu, *Journal of Computer and System Sciences* Vol.68, No.1 (2004) 1-21.
29. "Word Complexity and Repetitions in Words", by L. Ilie and S. Yu, *International Journal of Foundation of Computer Science* Vol. 15, No. 1 (2004) 41-56.
30. "Follow automata" by L. Ilie and S. Yu, *Information and Computation* vol. 186, no. 1 (2003) 140-162.
31. "Reducing NFA by invariant equivalences", by L. Ilie and S. Yu, *Theoretical Computer Science* vol. 306, no. 1-3 (2003) 373-390.
32. "A Formal Study of Practical Regular Expressions", by C. Campeanu, K. Salomaa, S. Yu, *International Journal of Foundation of Computer Science*, Vol. 14, No. 6 (2003) 1007-1018.

33. “Decidability of EDT0L structural equivalence”, by K. Salomaa and S. Yu, *Theoretical Computer Science* Vol. 276, No. 1-2 (2002) 245-259.
34. “On the robustness of primitive words” by G. Paun, N. Santean, G. Thierrin, S. Yu, *Discrete Applied Mathematics* 117 (2002) 239-252.
35. “Tight lower bound for the state complexity of shuffle of regular languages”, by C. Campeanu, K. Salomaa, S. Yu, *Journal of Automata, Languages and Combinatorics*, 7 (2002) 3, 303-310.
36. “Factorizations of Languages and Commutativity Conditions”, by A. Mateescu, A. Salomaa, S. Yu, *Acta Cybernetica* 15 (2002) 339-351.
37. “A sharpening of the Parikh mapping”, by A. Mateescu, A. Salomaa, K. Salomaa, S. Yu, *Theoretical Informatics and Applications* , 35 (2001) 551-564.
38. “An Efficient Algorithm for Constructing Minimal Cover Automata for Finite Languages” by C. Campeanu, A. Paun, S. Yu, *International Journal of Foundations of Computer Science* Vol. 13, No. 1 (2002) 83-97.
39. “Minimal Cover-Automata for Finite Languages”, by C. Campeanu, N. Santean, S. Yu, *Theoretical Computer Science* 267 (2001) 3-16.
40. “On the state complexity of k-entry deterministic finite automata”, by M. Holzer, K. Salomaa, S. Yu, *Journal of Automata, Languages and Combinatorics* Vol. 6 (2001) 4, 453-466.
41. “Tree-Systems of Morphisms” , by J. Dassow, G. Paun, G. Thierrin, S. Yu, *Acta Informatica*, 38 (2001) 131-153.
42. “State Complexity of Regular Languages” by S. Yu, *Journal of Automata, Languages and Combinatorics*, 6 (2001) 2, 221-234.
43. “Efficient implementation of regular languages using reversed alternating finite automata”, by K. Salomaa, X. Wu, S. Yu, *Theoretical Computer Science*, 231/1 (2000) 103-111.
44. “Using DNA to solve the bounded post correspondence problem”, by L. Kari, G. Gloor and S. Yu, *Theoretical Computer Science*, 231/2 (2000) 193-203.
45. “On Fairness of Many-Dimensional Trajectories”, by A. Mateescu, K. Salomaa, S. Yu, *Journal of Automata, languages and Combinatorics* 5 (2000) 2, 145-157.
46. “Alternating Finite Automata and Star-Free Languages”, by K. Salomaa and S. Yu, *Theoretical Computer Science*, 234 (2000) 167-176.
47. “Synchronization expressions and languages”, by K. Salomaa and S. Yu, *Journal of Universal Computer Science*, Vol. 5, Nr. 9 (1999) 610–621.
48. “On Synchronization in P Systems”, by G. Paun and S. Yu, *Fundamenta Informaticae*, vol.38, no.4 (1999) 397-410.
49. “Generalized fairness and context-free languages”, by K. Salomaa and S. Yu, *Acta Cybernetica* 14 (1999) 193-203.
50. “Synchronization Expressions with Extended Join Operation”, by K. Salomaa and S. Yu, *Theoretical Computer Science* 207 (1998) 73-88.
51. “DNA computing, sticker systems and universality”, by L. Kari, G. Paun, G. Rozenberg, A. Salomaa, S. Yu, *Acta Informatica* 35 (1998) 401-420.

52. “NFA to DFA Transformation for Finite Languages over Arbitrary Alphabets”, by K. Salomaa and S. Yu, *Journal of Automata, Languages and Combinatorics*, 2 (1997) 3, 177-186.
53. “Physical versus Computational Complementarity I” by C. Calude, K. Svozil, S. Yu, *International Journal of Theoretical Physics*, Vol. 36, No. 7 (1997) 1495-1523.
54. “Language-Theoretic Complexity of Disjunctive Sequences”, by C. Calude and S. Yu, *Discrete Applied Mathematics* (80) 2-3 (1997) 199-205.
55. “Structural equivalence and ET0L grammars”, by K. Salomaa, D. Wood, S. Yu, *Theoretical Computer Science* 164 (1996) 123-140.
56. “On Synchronization Languages”, by L. Guo, K. Salomaa, S. Yu, *Fundamenta Informaticae* 25 (1996) 423-436.
57. “Program Reuse via Kind-Bounded Polymorphism”, by S. Yu and Q. Zhuang, *Journal of Computing and Information*, Vol.2, No.1 (1996) 1163-1181.
58. “Complexity of EOL structural equivalence”, by K. Salomaa, D. Wood, S. Yu, *RAIRO Theoretical Informatics and Applications* , Vol.29, No.6 (1995) 471-485.
59. “Decision problems for patterns”, by T. Jiang, A. Salomaa, K. Salomaa, S. Yu, *Journal of Computer and System Sciences*, Vol.50, No.1 (1995) 53-63.
60. “P, NP and the Post Correspondence Problem”, by A. Mateescu, A. Salomaa, K. Salomaa, S. Yu, *Information and Computation*, Vol. 121, No. 2 (1995) 135-142.
61. “Measuring Degrees of Nondeterminism for Pushdown Automata”, by K. Salomaa and S. Yu, *Journal of Computer and System Sciences*, Vol. 49, No. 2 (1994) 362-374.
62. “Algorithmic Abstraction in Object-Oriented Languages”, by S. Yu and Q. Zhuang, *Journal of Object-Oriented Systems* 2 (1995) 217-236.
63. “Fuzzy Automata in Lexical Analysis”, by A. Mateescu, A. Salomaa, K. Salomaa, S. Yu, *Journal of Universal Computing*, Vol.1, No.5 (1995).
64. “Pumping and Pushdown Machines”, by K. Salomaa, D. Wood, S. Yu, *RAIRO Theoretical Informatics and Applications* , Vol. 28, No. 3-4 (1994) 221-232.
65. “Decidability of the Intercode Property”, by H. Jürgensen, K. Salomaa, S. Yu, *Journal of Information Processing and Cybernetics* 29 (1993) 6, 375-380 (actually appear in 1994).
66. “Pattern languages with and without erasing”, by T. Jiang, E. Kinber, A. Salomaa, K. Salomaa, S. Yu, *International Journal of Computer Mathematics*, Vol. 50 (1994) 147-163.
67. “On the state complexity of some basic operations on regular languages”, by K. Salomaa, S. Yu, Q. Zhuang, *Theoretical Computer Science* 125 (1994) 315-328.
68. “Transducers and the decidability of independence in free monoids”, by H. Jürgensen and K. Salomaa, S. Yu, *Theoretical Computer Science* 134 (1994) 107-117.
69. “On sparse language L such that $LL = \Sigma$ ”, by P. Enflo, A. Granville, J.Shallit, S. Yu, *Discrete Applied Mathematics* 52 (1994) 275-285.
70. “Limited nondeterminism for pushdown automata”, by K. Salomaa and S. Yu, *EATCS Bulletin* 50 (1993) 186-193.

71. "Attempting Guards in Parallel: A Dataflow Approach to Execute Generalized Communication Guards", by R. Govindarajan and S. Yu, *International Journal of Parallel Programming*, Vol. 21, No. 4 (1992) 225-268.
72. "Decidability of Structural Equivalence of EOL Grammars", by K.Salomaa and S. Yu, *Theoretical Computer Science* 82 (1991) 131-139.
73. "Cellular Automata, $\omega\omega$ -Regular Sets, and Sofic Systems", by K.Culik II and S. Yu, *Discrete Applied Mathematics* 32 (1991) 85-101.
74. "Primality Types of Instances of the Post Correspondence Problem", by A. Salomaa, K. Salomaa, S. Yu, *EATCS Bulletin* 44 (1991) 226-241.
75. "Computation Theoretic Aspects of Global Cellular Automata Behavior", by K.Culik II, L.P.Hurd, S. Yu, *Physica D* 45 (1990) (Special issue on cellular automata), 357-378.
76. "Finite-Time Behavior of Cellular Automata", by K.Culik II, L.P.Hurd, S. Yu, *Physica D* 45 (1990) (Special issue on cellular automata), 396-403.
77. "Constructions on Alternating Finite Automata", by A.Fellah, H.Jürgensen, S. Yu, *International Journal of Computer Mathematics*, Vol.35, No.3 & 4, (1990) 117-132.
78. "The Immortality Problem for Lag Systems", by K.Salomaa and S. Yu, *Information Processing Letters* (IPL), 36 (1990) 311-315.
79. "A Pumping Lemma for Deterministic Context-Free Languages", *Information Processing Letters* 31 (1989) 47-51.
80. "On the Limit Sets of Cellular Automata", by K.Culik II, J.Pachl, S. Yu, *SIAM Journal on Computing*, Vol. 18, No. 4, August (1989) 831-842.
81. "Undecidability of CA Classification Schemes", by K. Culik II and S. Yu, *Complex Systems* 2 (April,1988) 177-190.
82. "The Emptiness Problem for CA Limit Sets", by K. Culik II and S. Yu, *Mathematical and Computer Science Modeling* 11 (1988) 363-366.
83. "Can the Catenation of Two Sparse Languages Be Dense?", by S. Yu, *Discrete Applied Mathematics* 20 (1988) 265-267.
84. "Fault-Tolerant Schemes for Some Systolic Systems", by K. Culik II and S. Yu, *International Journal of Computer Mathematics* 22 (1987) 13-42.
85. "Decision Problems Resulting From Grammatical Inference", by S. Horvath, E. Kinber, A. Salomaa, S. Yu, *Annales Academiae Scientiarum Fennicae*, Series A. 1. Mathematica, Vol. 12 (1987) 287-298.
86. "On a Public-Key Cryptosystem Based on Iterated Morphisms and Substitutions", by A. Salomaa and S. Yu, *Theoretical Computer Science* 48 (1986) 283-296.
87. "Real Time, Pseudo Real Time and Linear Time ITA", by K.Culik II and S. Yu, *Theoretical Computer Science* 47 (1986), 15-26.
88. "A Property of Real-Time Trellis Automata", by S. Yu, *Discrete Applied Mathematics* 15 (1986), 117-119.
89. "On the Equivalence of Grammars Inferred from Derivations", by E. Kinber, A. Salomaa, S. Yu, *EATCS Bulletin* 29 (1986) 186-193.

90. “Iterative Tree Arrays with Logarithmic Depth”, by K. Culik II, O. H. Ibarra, S. Yu, *International Journal of Computer Mathematics* 20 (1986) 187-204.
91. “Iterative Tree Automata”, by K. Culik II and S. Yu, *Theoretical Computer Science* 32 (1984), 227-247.

Books and journals edited:

91. A special issue of *International Journal of Foundations of Computer Science* for the selected papers of DLT 2010, edited by Y. Gao, H. Lu, S. Seki, S. Yu, to appear soon.
92. *Seventy Years Derick Wood*, by H. Jurgensen, H. Maurer, A. Salomaa, S. Yu, a special issue of *Journal of Universal Computer Science* 16(5), 2010.
93. *Developments in Language Theory*, edited by Y. Gao, H. Lu, S. Seki, S. Yu, Proceedings of the 14th International Conference DLT 2010, LNCS 6224, 2010.
94. *Implementation and Application of Automata*, edited by M. Domaratzki, A. Okhotin, K. Salomaa, S. Yu, Springer LNCS 3317, 2005.
95. *International Journal of Foundation of Computer Science*, Vol. 13, No. 1 (2002), edited by S. Yu.
96. *A Half Century of Automata Theory*, edited by A. Salomaa, D. Wood, S. Yu, World Scientific, 2001.
97. *Words, Semigroups, Transductions*, edited by M. Ito, G. Paun, S. Yu, World Scientific, 2001.
98. *Implementation and Application of Automata*, edited by S. Yu and A. Paun, Springer LNCS 2088 (2001).
99. *Theoretical Computer Science* 231/1 (a special issue), Jan. 2000, edited by K. Salomaa, D. Wood, S. Yu.
100. *Automata Implementation WIA’97* (LNCS 1436), Springer 1998, edited by D. Wood and S. Yu.
101. *Automata Implementation WIA’96* (LNCS 1260), Springer 1997, edited by D. Raymond, D. Wood, S. Yu.

Book chapters and papers in other journals or LNCS:

101. “Cover Automata for Finite Languages”, by S. Yu, in *Formal Language Theory Column* by A. Salomaa, in *EATCS Bulletin* 92 (2007) 65-74.
102. “State Complexity of Finite and Infinite Regular Languages”, by S. Yu, in *Current Trends in Theoretical Computer Science – The Challenge of the New Century*, Vol. 2, 2004, pps. 567-580, World Scientific, edited by G. Paun, G. Rozenberg, A. Salomaa.
103. “On NFA Reductions”, by L. Ilie, G. Navarro, S. Yu, *Theory Is Forever*, LNCS 3113, 2004, pps. 112-124, edited by J. Karhumäki, H. Maurer, G. Paun, G. Rozenberg.
104. “Finite Automata”, by S. Yu, in *Formal Languages and Applications*, edited by C. Martin-Vide, V. Mitrana, G. Paun, *Studies in Fuzziness and Soft Computing* 148. Springer, (2004) 55-85.
105. “Class-is-type is inadequate for object reuse”, by S. Yu, *ACM Sigplan Notices* vol. 36, no. 6 (2001) 50-59.
106. Chapter 14: “The Time Dimension of Computation Models”, by S. Yu, in *Where Mathematics, Computer Science, Linguistics and Biology Meet*, 161-172, Kluwer 2001.

107. Chapter 5: “State Complexity of Regular Languages: Finite Versus Infinite”, by C. Campeanu, K. Salomaa, S. Yu, in *Finite vs Infinite – Contributions to an Eternal Dilemma*, edited by C. Calude and G. Paun, Springer 2000, pps. 53-73.
108. “Synchronization Expressions: Characterization Results and Implementation”, by K. Salomaa and S. Yu, in *Jewels are Forever*, Springer 1999.
109. “Chapter 2. Regular Languages”, by S. Yu, in *Handbook of Formal Languages*, edited by G. Rozenberg and A. Salomaa, Springer, 1998, 41-110.
110. “Chapter 2: Topological Transformation of Systolic Systems”, by K. Culik II and S. Yu, *Transformational Approaches to Systolic Design*, edited by G.M. Megson, Chapman and Hall, 1994, 34-52.
111. “Rewriting Rules for Synchronization Languages” (invited article), by K. Salomaa and S. Yu, *Lecture Notes in Computer Science* 1261, Springer, 1997, 322-338.
112. “Rediscovering Pushdown Machines” (invited article), by K. Salomaa, D. Wood, and S. Yu, in *Lecture Notes in Computer Science* 812, Springer-Verlag, 1994, 372-385.
113. “On the State Complexity of Intersection of Regular Languages”, by S. Yu and Q. Zhuang, *ACM SIGACT News*, Vol. 22, No. 3, (1991) 52-54.
104. “State complexity of combined operations with union, intersection, star and reversal”, by Y. Gao, S. Yu, *Theoretical Computer Science*, submitted in 2011.
105. “State complexity and approximation”, by Y. Gao and S. Yu, *International Journal of Foundations of Computer Science*, submitted 2011.
106. “State complexity approximation of combined operations”, by Y. Gao and S. Yu, *Journal of Computer and System Sciences*, submitted.
107. “Undecidability of State Complexity”, by A. Salomaa, K. Salomaa, S. Yu, *International Journal of Computer Mathematics*, submitted.

In refereed conference proceedings:

116. “State Complexity Research and Approximation”, by S. Yu and Y. Gao, 15th International Conference on Developments in Language Theory (DLT 2011), invited talk, Springer LNCS 6795, pp. 46-57.
117. “Undecidability of the State Complexity of Composed Regular Operations”, by A. Salomaa, K. Salomaa, S. Yu, 5th International Conference on Language and Automata Theory and Applications (LATA 2011), in Springer LNCS 6638, pp. 489-498.
118. “Derick Wood: Always in Our Hearts”, by S. Yu, 16th International Conference on Implementation and Application of Automata (CIAA 2011), invited talk, in Springer LNCS 6807, pp. 1-2.
119. “State complexity of four combined operations composed of union, intersection, star and reversal”, by Y. Gao and S. Yu, *Proceedings of 13th Descriptive Complexity of Formal Systems*, Springer LNCS 6808 (2011) 158-171.
120. “State Complexity of Catenation Combined with Union and Intersection”, by B Cui, Y. Gao, L. Kari, S. Yu, 15th International Conference on Implementation and Application of Automata (CIAA 2010) 95-104. Also in Springer LNCS 6482, pp. 95-104.

121. “Transition Complexity of Incomplete DFAs”, by Y. Gao, K. Salomaa, S. Yu, *Descriptive Complexity of Formal Systems (DCFS 2010)* 99-109.
122. “State Complexity of Catenation Combined with Star and Reversal”, by B. Cui, Y. Gao, L. Kari, S. Yu, *Descriptive Complexity of Formal Systems (DCFS 2010)* 58-67.
123. “State complexity approximation”, by Y. Gao and S. Yu, *Proceedings of Descriptive Complexity of Formal Systems (2009)* 163-174.
124. “Are Statecharts Finite Automata?”, by H. Lu and S. Yu, *Proceedings of The 14th International Conference on Implementation and Application of Automata* Springer LNCS 5642, (2009) 258-261.
125. “State Complexity of Combined Operations for Prefix-Free Regular Languages”, by Y.-S. Han, K. Salomaa, S. Yu, *International Conference on Language and Automata Theory and Applications (LATA 2009)* 398-409.
126. “Estimation of State Complexity of Combined Operations”, by Z. Esik, Y. Gao, G. Liu, S. Yu, *Descriptive Complexity of Formal Systems (DCFS 2008)* 168-181.
127. “Length codes, products of languages and primality”, by A. Salomaa, K. Salomaa, S. Yu, *International Conference on Language and Automata Theory and Applications (LATA 2008)* 487-498. Also in Springer LNCS 5196 (2008) pp. 476-486.
128. “Deterministic Caterpillar Expressions”, by K. Salomaa, S. Yu, and J. Zan, CIAA 2007, appeared in Springer LNCS 4783 (2007) 97-108.
129. “State Complexity of Basic Operations Combined with Reversal”, by G. Liu, C. Martin-Vide, A. Salomaa, and S. Yu, *International Conference on Language and Automata Theory and Applications (LATA 2007)* 355-366.
130. “On the state complexity of combined operations”, by S. Yu, *International Conference on Implementation and Application of Automata (CIAA 2006)*, Springer LNCS 4094, pp. 11-22 (invited speech).
131. “State complexity of catenation and reversal combined with star”, by Y. Gao, K. Salomaa, S. Yu, *Descriptive Complexity of Formal Systems (DCFS 2006)* 153-164.
132. “On Weakly Ambiguous Finite Transducers”, by N. Santean and S. Yu, *10th International Conference on Developments in Language Theory (DLT 2006)*, LNCS 4036, pp. 156-167.
133. “Large NFA without mergible states”, by C. Campeanu, N. Santean, S. Yu, *Proceedings of 7th Descriptive Complexity of Formal Systems (DCFS 2005)* 75-84.
134. “Type Theory and Language Constructs for Objects with States”, by H. Xu and S. Yu, *International Workshop on Development in Computational Models (DCM 2005)* 45-54.
135. “Reducing the size of NFAs by using equivalences and preorders”, by L. Ilie, R. Solis-Oba, S. Yu, *Proceedings of the 16th Annual Symposium on Combinatorial Pattern Matching (CPM 2005)*, LNCS 3537, pp. 310-321.
136. “Adding States into Object Types”, by Haitong Xu and Sheng Yu, *Proceedings of the 2005 International Conference on Programming Languages and Compilers (PLC’05)* 101-107.
137. “Process Traces with the Option Operation”, S. Yu and Q. Zhao, *Proceedings of the 2004 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA’04)* 750-755 (2004).

138. "Introduction to Process Traces", by L. Ilie, S. Yu, Q. Zhao, *Proceedings of the 2003 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'03)* 1706-1712 (2003).
139. "Fast Algorithms for Extended Regular Expression Matching and Searching", by L. Ilie, B. Shan, S. Yu, *20th Annual Symposium on Theoretical Aspects of Computer Science (STACS 2003)*, LNCS 2607, 179-190.
140. "Regex and Extended Regex", by C. Campeanu, K. Salomaa, S. Yu, *International Conference on Implementation and Application of Automata (2002)* 81-90, LNCS 2608, 77-84.
141. "Algorithms for computing small NFAs", by L. Ilie and S. Yu, *Mathematical Foundation of Computer Science*, LNCS 2420 (2002) 328-340.
142. "Repetition Complexity of Words", by L. Ilie, S. Yu, K. Zhang, *International Conference on Computing and Combinatorics (COCOON) 2002*, LNCS 2387 320-329.
143. "Constructing NFAs by optimal use of positions in regular expressions", by L. Ilie and S. Yu, *Symposium on Combinatorial Pattern Matching, CPM 2002*, LNCS 2373 279-288.
144. "Minimal Covers of Formal Languages", by M. Domaratzki, J. Shallit, S. Yu, *Development in Language Theory (2001)* 333-344.
145. "An $O(n^2)$ Algorithm for Constructing Minimal Cover Automata for Finite Languages", by A. Paun, N. Seatan, S. Yu, *Fifth International Conference on Implementation and Application of Automata (2000)* 233-241.
146. "State Complexity of Regular Languages", by S. Yu, *Descriptive Complexity of Automata, Grammars and Related Structures (1999)* 77-88.
147. "State Complexity of Basic Operations on Finite Languages", by C. Campeanu, K. Culik, K. Salomaa, S. Yu, *Proceedings of the Fourth International Workshop on Implementing Automata VIII* 1-11, 1999. LNCS 2214, pp.60-70.
148. "Decomposition of Finite Languages" (Invited lecture), by A. Salomaa and S. Yu, *Proceedings of Fourth International Conference on Developments in Language Theory (1999)* 8-20.
149. "Metric Lexical Analysis", by C. Calude, K. Salomaa, and S. Yu, *Proceedings of the Fourth International Workshop on Implementing Automata VI* 1-12, 1999, *Springer Lecture Notes in Computer Science* 2214, pp. 48-59.
150. "Practical Rules for Reduction on the Number of States of a State Diagram", by J. Ma and S. Yu, *Proceedings of the 26th International Conference on Technology of Object-Oriented Languages and Systems (TOOLS USA '98)* (1998) 46-57, Santa Barbara.
151. "Implementing R-AFA Operations", by S. Huerter, K. Salomaa, X. Wu, S. Yu, *Proceedings of the Third International Workshop on Implementing Automata (WIA'98)* 1998, 54-64.
152. "Minimal Cover-Automata for Finite Languages", by C. Campeanu, N. Santean, S. Yu, *Proceedings of the Third International Workshop on Implementing Automata (WIA'98)* 1998, 32-42.
153. "An Efficient Implementation of Regular Languages Using r-AFA", by K. Salomaa, X. Wu, S. Yu, *Proceedings of the Second International Workshop on Implementing Automata (WIA'97)* 1997, 33-42. Also in LNCS 1436, 176-184.
154. "Decidability of fairness for context-free languages" by A. Mateescu, K. Salomaa, S. Yu, *Proceedings of Third International Conference on Developments in Language Theory (1997)* 351-364.

155. "At the Crossroads of DNA Computing and Formal Languages: Characterizing Recursively Enumerable Languages Using Insertion-Deletion Systems", by L. Kari, G. Paun, G. Thierrin, S. Yu, Proceedings of the Third Annual DIMACS Workshop on DNA Based Computers, (1997) 329-346.
156. "EDT0L Structural Equivalence Is ", by K. Salomaa and S. Yu, Proceedings of DMTCS'96 (Discrete Mathematics and Theoretical Computer Science, by Springer), Dec. 1996, 363-375.
157. "Loop-Free Alternating Finite Automata", by K. Salomaa and S. Yu, Proceedings of the 8th International Conference on Automata and Formal Languages, July 29-Aug. 2, 1996, 979-988.
158. "NFA to DFA Transformation for Finite Languages", by K. Salomaa and S. Yu, the 1996 International Workshop on Implementing Automata (WIA'96), (Aug. 28-30, 96), also appeared in Lecture Notes in Computer Science 1260, Springer, 1997, 149-158.
159. "Language-Theoretic Complexity of Disjunctive Sequences", by C. Calude and S. Yu, Proceedings of the Australian Theory Symposium, 1996, 175-180.
160. "Software Reuse via Algorithm Abstraction", by S. Yu and Q. Zhuang, Proceedings of the 17th International Conference on Technology of Object-Oriented Languages and Systems (TOOLS-USA 17), 1995, 277-292.
161. "Measuring Nondeterminism of Pushdown Automata" by K. Salomaa and S. Yu, International Conference on Development in Language Theory, July, 1995, 154-165.
162. "Synchronization Expressions and Languages", by L. Guo, K. Salomaa, S. Yu, Proceedings of IEEE Symposium on Parallel and Distributed Processing, Oct. 1994, 257-264.
163. "Rediscovering Pushdown Machines", by K. Salomaa, D. Wood, S. Yu, *Results and Trends in Theoretical Computer Science*, Colloquium Proceedings appeared in Lecture Notes in Computer Science 812, 1994, 372-385.
164. "Inclusion is undecidable for pattern languages", by T. Jiang, A. Salomaa, K. Salomaa, S. Yu, Proceedings of the 20th International Colloquium on Automata, Languages, and Programming (ICALP'93), 1993, 301-312.
165. "Structural equivalence and ET0L grammars", by K. Salomaa, D. Wood, S. Yu, Proceedings of the 10th international Conference on Fundamentals of Computation Theory, 1993, 430-439.
166. "Characterizing Regular Languages with Polynomial Densities", by A. Szilard, S. Yu, K. Zhang, J. Shallit, *Proceedings of the 17th International Symposium on Mathematical Foundations of Computer Science*, Aug. 1992, 494-503. (Lecture Notes in Computer Science 629)
167. "State Complexity of Some Basic Operations on Regular Languages", by K. Salomaa, S. Yu, Q. Zhuang, *Proceedings of the 4th International Conference on Computer and Information*, 1992, 95-99.
168. "Iterative Tree Automata, Alternating Turing Machines, and Uniform Boolean Circuits: Relationships and Characterizations", by A. Fellah and S. Yu, *Proceedings of the 1992 ACM Symposium on Applied Computing*, 1992, 1159-1166.
169. "Degree of Nondeterminism for Context-Free Languages", by K. Salomaa and S. Yu, *Proceedings of the 8th International Conference on Fundamentals of Computation Theory*, Sept. 1991, 380-389.
170. "PARC Project: Practical Constructs for Parallel Programming Languages", by S. Yu, L. Guo, R. Govindarajan, and P. Wang, *the Proceedings of the IEEE Fifteenth Annual International Computer Software and Applications Conference*, Sept. 1991, 183-189.

171. “Attending Guards in Parallel: A Data Flow Approach to Execute Generalized Guarded Commands”, by Govindarajan and S. Yu, *the proceedings of PARLE’91 Parallel Architectures and Languages Europe*, June 1991, 372-389.
172. “Alternating Finite Automata”, by A. Fellah, H. Jurgensen, S. Yu, *Proceedings of the 1990 International Conference on Computer and Information*, 1990, 140-143.
173. “Translation of Systolic Algorithms between Systems of Different Topology”, by K. Culik II and S. Yu, *Proceedings of IEEE International Conference on Parallel Processing*, 1985, 756-763.

In other conferences:

164. “State Complexity: Recent Results and Open Problems”, invited talk at the ICALP Formal Language Symposium 2004.
165. “Evolutions of Cellular Automaton Configurations”, by S. Yu, invited talk at the American Mathematical Society Meeting, Tampa, March 23, 1991.
166. “Sofic Systems, $\omega\omega$ -Rational Sets and CA”, by S. Yu, Cellular Automata: Theory and Experiment, Sept. 1989, Los Alamos.
167. “On the Computing Power of Tree Architecture”, by S. Yu, First Montreal Conference on Combinatorics and Computer Science (1987).
168. “The Emptiness Problem of CA Limit Sets”, by S. Yu, Sixth International Conference on Mathematical Modeling (1987).
169. “ITA with Logarithmic Depths”, by S. Yu, invited talk at 1986 Finnish Mathematics conference.

GRADUATE STUDENT AND POSTDOCTORAL FELLOW SUPERVISION

Postdoctoral fellows:

- R. Govindarajan (1990-1991)
- K. Salomaa (NSERC International Fellowship, 1992-1993)
- S. Dube (NSERC International Fellowship, 1995)
- C. Campeanu (1997-1998)

PhD students:

- A. Fellah, Title: “Alternating Finite Automata and Related Problems” (Assoc. Prof., U. of Lethbridge, Graduated in 1991)
- Lifu Guo, Title: “Synchronization Expressions in Parallel Languages” (IBM Toronto Lab., graduated in 1995)
- Qingyu Zhuang, Title: “Algorithmic Abstraction in Object-Oriented Programming Languages” (Bell Lab., Lucent, Chicago, graduated in 1996)
- Andrei Paun, Title: “Unconventional Models of Computation: DNA and Membrane Computing” (Assist. Prof., Louisiana Tech, graduated in 2003)
- Nicolae Santean, Title: “Selected Topics on Sequential Machines” (NSERC postdoc, graduated in 2006)
- Qing Zhao, Title: “SC-Expressions in Object-Oriented Languages” (Microsoft, graduated in 2007)

- Yuan Gao, Title: “Advanced Topics on State Complexity of Combined Operations” (graduated in 2010)
- Hanlin Lu (In progress)
- Jamil Ahmed (In progress)

Masters students:

- Peter Scheyen, Title: “New Constructs for Implementing Generic Functions and Parameterized Classes in C++” (Completed in January 1994)
- William Wong, Title: “WOCAM: A Cellular Automata Virtual Machine on MasPar” (Completed in June 1994)
- John Strybosch, Title: “Image Generation through Function Systems” (Graduated in 1995)
- J. H.G. Redekop, Title: “Lexical Analysis Using Fuzzy Regular Expressions” (Graduated in 1996)
- H. K. Cheung, Title: “An Efficient Implementation Method for Alternating Finite Automata” (Graduated in 1996)
- G. Liu, Title: “Representation and Implementation of Association in Object-Oriented Languages” (Graduated in 1997)
- Xiuming Wu, Title: “Efficient Implementation of Regular Languages Using R-AFA” (Graduated in 1997)
- Jin Ma, Title: “Practical Rules for Reduction on the Number of States of a State Diagram” (Graduated in 1998)
- Andrei Paun, Title: “DNA Computing: Generative mechanisms based on the splicing operation” (Graduated in 1999)
- Nicolae Santean, Title: “Towards A Minimal Presentation for Finite Languages: Theory and Practice” (Graduated in 1999)
- Wenxia Jiang, Title: “New Constructs for Component-Based Software Modeling and Design” (Graduated in 2000)
- Mihaela Paun, Title: “Watson-Crick Automata” (Graduated in 2000)
- Gang Li, Title: “Component Design and Application with UML and JavaBeans” (Graduated in 2001)
- Xiang Ji, Title: “Objects, Interactive Machines, and Statecharts” (Graduated in 2001)
- H. Li, Title: “Implementing Association Using Dynamic Hashing” (Graduated in 2001)
- Shan Zhong, Title: “A Comparison of OMT and UML” (Graduated in 2001)
- Jing Chen, Title: “Synchronization Expressions in Concurrent Object-Oriented Programming Languages” (Graduated in 2001)
- Huiwen Li, Title: “Extended Regular Expressions” (Graduated in 2001)
- Zhenheng Li, Title: “Formalization of State Diagrams” (Graduated in September 2002)
- Qing Zhao, Title: “Introduction to Parallel Traces” (Graduated in January 2003)
- Yongbo An, Title: “AutoML: Definition and Implementation” (Graduated in January 2004)
- L. Sujit K. Kancherla, Title: “NFA Minimization for Finite Languages” (Graduates in December 2004)
- Zheng Ye, Title: “Comparison of Software CMM/CMM Integration and Agile Development Method/eXtreme Programming” (Graduated in May 2005)
- Yuan Gao, Title: “State Complexity of Combined Operations” (Graduated in December 2006)

- Hanlin Lu, Title: “Interaction based models for statecharts” (Graduated in December 2008)
- Jahedur Rahman Chowdhury (started in Sept. 2010)
- Timothy Ng (started in Sept. 2011)
- Asaduzzaman Babu (started in Sept. 2011)

SERVICES

- Member of the Chair Selection Committee, 2009-2011
- Member of the Graduate Executive Committee, 2010-2011
- Member of the Annual Evaluation Committee, 2010-2011
- Member of the PhD Review Committee, 2010-2011
- Member of the departmental Research Committee, 2010-2011
- Member of the Graduate Executive Committee, 2009-2010
- Member of the Annual Evaluation Committee, 2009-2010
- Member of the PhD Review Committee, 2009-2010
- Member of the departmental Research Committee, 2009-2010
- Member of the Graduate Executive Committee, 2008-2009
- Member of the Annual Evaluation Committee, 2008-2009
- Member of the PhD Comprehensive Examination Committee, 2008-2009
- Member of the departmental Research Committee, 2008-2009
- Panel chair of the 2007-2008 Ontario Graduate Scholarship (OGS) Committee
- Member of the Graduate Executive Committee, Dept. of Computer science, 2007-2008
- Member of the Annual Evaluation Committee, 2007-2008
- Member of the PhD Comprehensive Examination Committee, 2007-2008
- Member of the departmental Research Committee, 2007-2008
- Panel chair of the 2006-07 Ontario Graduate Scholarship (OGS) Committee
- Member of the Graduate Executive Committee, Dept. of Computer science, 2005-2006
- Panel member of the 2005-06 Ontario Graduate Scholarship (OGS) Committee
- Member of the Tenure and Promotion Committee, 2004-2007 (sabbatical in 2006-07)
- Panel Chair of the 2005 Ontario Graduate Scholarship (OGS) Committee
- Member of the Graduate Executive Committee, Dept. of Comp. Sci., 2004-2005
- Member of the Annual Evaluation Committee, 2004-2005
- Member of the PhD Comprehensive Examination Committee, 2004-2005

- Member of the Graduate Executive Committee, Dept. of Comp. Sci., 2003-2004
- Member of the Annual Evaluation Committee, 2003-2004
- Member of the Departmental Appointment Committee, 2003-2004
- Member of the PhD Comprehensive Examination Committee, 2003-2004
- Member of the Annual Evaluation Committee, 2002-2003
- Member of the Promotion and Tenure Committee, 2001-2002
- Member of the Annual Evaluation Committee, 2001-2002
- Member of the Departmental Appointment Committee, 2001-2002
- Member of the Chair Selection Committee, 2001-2002
- Member of the PhD Comprehensive Examination Committee, 2000-2002
- Member of the departmental Appointment and Tenure Committee, 1999-2000
- Graduate chair, 1996-98
- Member of the Chair Selection Committee (for Computer Science), 1996-97
- Member of the departmental Appointment and Tenure Committee, 1995-97
- Member of the Department Executive Committee, 1995-1998
- Graduate Chair, Dept. of Computer Science, 1996-98
- Associate chair, Dept. of Computer Science, 1995-96
- Member of departmental Appointment and Tenure Committee, 1992-94
- Chair of the PhD Comprehensive Examination Committee, Dept. of Comp. Sci., 1991-94
- Member of the Graduate Executive Committee, Dept. of Comp. Sci., 1989-1993
- Member of the Chair Selection Committee (for Computer Science), 1992
- Panel chair of the Ontario Graduate Scholarship (OGS) committee, 1992, 1993
- Panel member of the Ontario Graduate Scholarship (OGS) committee, 1991
- Member of the Graduate Executive Committee, Dept. of Mathematics and Computer Science, Kent State University, 1988-1989
- Colloquium chair, Dept. of Mathematics and Computer Science, Kent State University, 1988-1989

COURSES TAUGHT AT U.W.O. (Not including reading courses)

- CS028 Introduction to Computer Science
- CS307 Object-Oriented Modeling and Design
- CS331 Foundations of Computer Science I
- CS342 Organization of Programming Languages

CS390 Industrial Internship
CS430/CS520 Automata Theory, Formal Languages, and Parsing
CS432/CS540 Foundations of Computer Science II
CS453/CS561 Advanced Computer Architecture
CS490 Senior Thesis
CS534 Object-Oriented Analysis and Design
CS619 Parallel Programming
CS620 Advanced Automata Theory
CS720 Advanced Topics in Automata and Formal Language Theory
CS724 Advanced Parsing and Formal language Theory
CS850 Theory of Concurrency and Synchronization
CS870 Automata and Implementation
CS876 State Complexity
CS877 Theory of Objects
CS883 New Directions in Formal Language Theory