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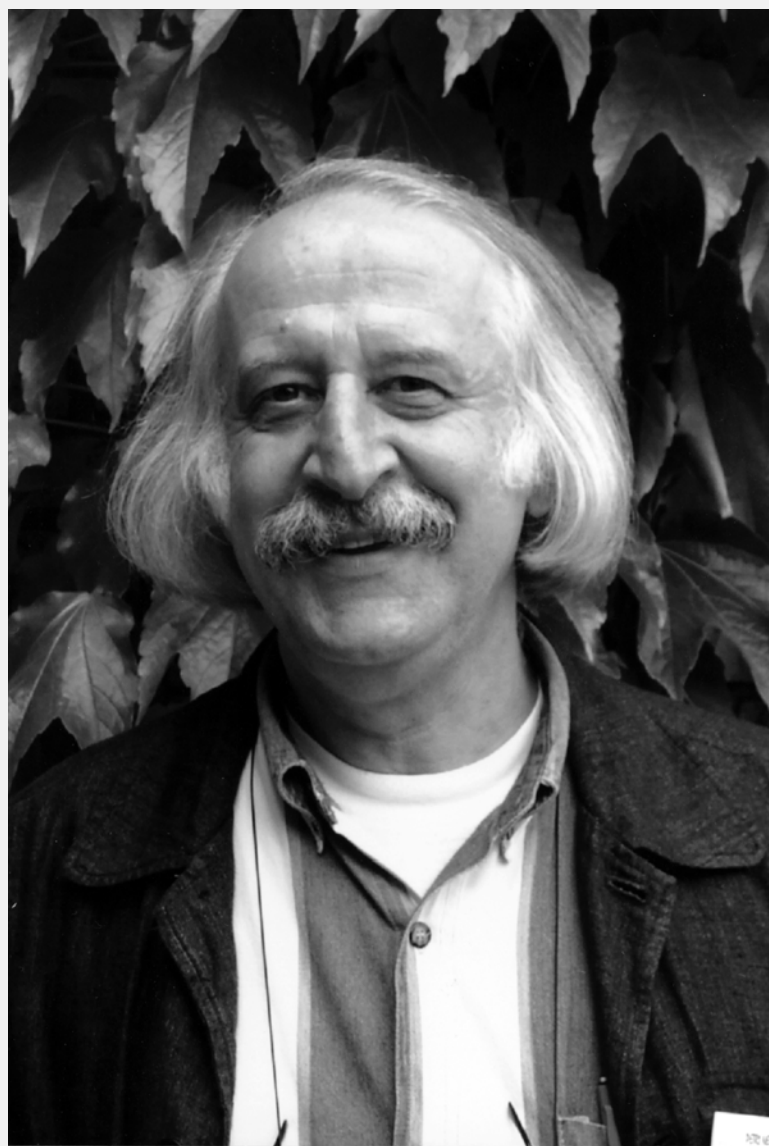
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Formal and Natural Computing

Essays Dedicated to Grzegorz Rozenberg



Springer

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Preface

This book presents state of the art research in theoretical computer science and related fields. In particular, the following areas are discussed: automata theory, formal languages and combinatorics of words, graph transformations, Petri nets, concurrency, as well as natural and molecular computing. The articles are written by leading researchers in these areas. The writers were originally invited to contribute to this book but then the normal refereeing procedure was applied as well. All of the articles deal with some issue that has been under vigorous study during recent years. Still, the topics range from very classical ones to issues raised only two or three years ago. Both survey articles and papers attacking specific research problems are included.

The book highlights some key issues of theoretical computer science, as they seem to us now at the beginning of the new millennium. Being a comprehensive overview of some of the most active current research in theoretical computer science, it should be of definite interest for all researchers in the areas covered. The topics range from basic decidability and the notion of information to graph grammars and graph transformations, and from trees and traces to aqueous algorithms, DNA encoding and self-assembly. Special effort has been given to lucid presentation. Therefore, the book should be of interest also for advanced students.

The feature common to all writers in this book is that they want to dedicate their work to *Grzegorz Rozenberg* on the occasion of his 60th birthday, March 14, 2002. In addition the topics belong to areas of his central interests, either currently or in the past. The broad spectrum of the topics is an indication of the width and diversity of the research of this great scientist. We have included in this book the bibliography of Grzegorz Rozenberg but we have not undertaken here the challenging task of describing or even outlining his scientific work. Instead, at the end of this Preface, each of the four editors presents his personal gratulatory greeting to Grzegorz. It is also very well known that Grzegorz Rozenberg occupies a central role in the theoretical computer science community in Europe. He was the President of EATCS for nine years and is still the Editor of the *EATCS Bulletin*, after being in this position already for more than twenty years. More about these matters can be read, for instance, in the book *People and Ideas in Theoretical Computer Science* (C. Calude, Ed.), Springer-Verlag, 1999, ISBN 981-4021-13-X, or in the *EATCS Bulletin* 46, 1992, 391–413.

The articles in this book are divided into five parts, according to their topics. A brief description of the individual parts now follows.

As its title *Words, Languages, Automata* indicates, the first part is concerned with the oldest issues in theoretical computer science. However, the papers reflect some currently active aspects of research. Classical context-free languages are considered in connection with the currently popular XML-documentation. Another old topic studies how simpler languages (for example regular languages)

can be used via trees to define more complicated ones (namely, context-free languages). Models of concurrency are discussed in two papers, using structural and logical approaches, respectively. The other four papers are connected to words. In two of those, old fundamental problems are addressed, namely, the celebrated Post Correspondence Problem and the commutation problem of Conway. Patterns occurring in infinite words is a challenging new topic. Finally, recent fundamental results on the structure of finite words are related to the notion of information.

Part two on graph transformations starts with a sightseeing tour of the computational landscape of this interesting field. The relationship between local action systems and algebraic graph grammars and bisimulation equivalences for graph grammars are discussed in two other contributions.

The concept of processes is addressed in part three on Petri nets from the high-level net point of view. Moreover, it is shown how Petri nets can be used as a control mechanism for grammar systems. Finally an interesting conjecture is presented relating regular event structures and finite Petri nets.

In addition to graph transformations and Petri nets, in part four, other models for concurrent computing are discussed. It is shown how object-oriented collaborative work can be supported by the concept of team automata. Other interesting topics are temporal concurrent constraint programming and how to use grammars as processes.

The final part deals with natural computing. Computation gleaned from nature is at its best in the article describing the amazing capabilities of ciliates. Studies about aqueous algorithms and self-assembly computations are also close to practical laboratory work. P systems have turned out to be a very useful model for natural computing. Some of the early aspects of DNA computing, namely splicing and DNA encoding, are addressed in two papers.

Acknowledgements. We thank all the authors and referees for their cooperation and timely work. We express our gratitude to Dadara for the cover, and to Hendrik Jan Hoogeboom and Marloes Boon-van der Nat for their help in various “local” matters. Special thanks are due to Arto Lepistö for unifying the files for print, and in many cases preparing parts of the script in the format required. Finally, thanks are due to Springer-Verlag, especially Mrs. Ingeborg Mayer.

Munich, Berlin and
Turku, December 2001

Wilfried Brauer, Hartmut Ehrig
Juhani Karhumäki, Arto Salomaa

Wilfried Brauer, personal greeting

Dear Nonpareil Amiable Grzegorz,

Sure, there are many more attributes fitting to you – but these are not suited to denote the area of your current scientific interest. Nevertheless, I cannot resist mentioning some more of your characteristics. Cooperative, multi-interested and witty: these features became evident to me when we first met (in the early 1970s) at Oberwolfach where you demonstrated how to squeeze languages out of Lindenmayer systems. Already then you did fruitful interdisciplinary research with biologists – as you do now in DNA computing. Quick to comprehend and speedy in entering new fields of research: so you conquered the area of Petri nets and concurrency after I invited you in 1979 to the first Advanced Course on Petri Nets in Hamburg. Determined, influential and winning: I got to know these traits of yours especially when you came onto the board of EATCS and (with many new ideas and activities) pushed EATCS forward on its way to becoming a large well-organized international scientific society. You are a good friend: this became obvious to all the many persons who listened to the excellent and cordial laudatio you presented at the festive colloquium in Munich on the occasion of my 60th birthday. And now it is your turn to celebrate this special birthday. I hope you will have a similar experience as I (and many others) have had: from this age on one looks at disorders and troubles from a more distant point of view and develops a more serene and calm attitude of mind. My congratulations and all my best wishes to you.

Wilfried

Hartmut Ehrig, personal greeting

Dear Grzegorz,

When I visited you for the first time in Utrecht you invited me to one of the famous pancake houses to investigate stacks of pancakes. In this way I learned by eating about the relationship between stacks in different areas, like computer science, biology and real life. Consequently we established a link between our favorite topics at that time, L-systems and graph grammars, leading not only to the new topic of parallel graph grammars, but also to the first international workshop on graph grammars with applications in computer science and biology. This first international workshop in 1978 was continued by five other ones in Europe and the USA until the last one in 1998. This, however, was not the end of graph grammars and graph transformations, but the starting point of a series of international conferences on graph transformations.

The special present from the entire graph transformation community and especially myself on your 60th birthday is the first International Conference on Graph Transformations, to be held in Barcelona, October 7–12, 2002. Let me thank you for your continuous support and cooperation concerning scientific as well as real-life topics, and I wish you all the best for the future in science and real life and the continuation of our friendship for further decades.

Hartmut

Juhani Karhumäki, personal greeting

Dear Grzegorz:

I met you for the first time in 1974 at the Workshop on Unusual Automata Theory in Aarhus. Two years later I was lucky to have you on the committee that heard the defence of my dissertation, and after that even luckier to work with you on scientific problems. In those years, and later, I learnt a lot from you not only about the spirit of science, but also about life itself. One teaching was: what ever you do, do it as well as you can – or even better! In all of your activities, whether it is writing papers, organizing conferences or collecting owls, this principle is strictly followed. After saying this I should not say anything about your unmatched scientific achievements. However, I will take a risk. You have written just one article on the theory of codes. This, written jointly with Andrzej, solved one of the main problems of the field. It provided a method, subsequently known as the Ehrenfeucht-Rozenberg method, for how to embed a rational code into a rational maximal one. This result amazed the French School and others who had worked for years on the problem. Still, it is only one of the jewels you have created.

I wish you all the best in all areas of your activities, including collecting owls.

Juhani

Arto Salomaa, personal greeting

Dear Bolgani:

Another scientist with his birthday on March 14, Albert Einstein, once said: *It would be possible to describe everything scientifically, but it would make no sense; it would be without meaning, as if you described a Beethoven symphony as a variation of wave pressure.* Let us look at your bibliography in this book. No matter how impressive it is and no matter how many landmark papers it contains, still much of Bolgani's magical impact in opening new vistas lies elsewhere than in numbered papers. I have experienced this personally already for over three decades. Cooperation with Bolgani, be it about L systems or ciliates, about decidability or finite automata, has been for me an inexhaustible source of ideas and inspiration. Our discussions about science also went on to considerations about important matters in life. Many questions remained unanswered, perhaps we will find an answer in Jerusalem. But we always had great fun.

On your birthday, I wish you all the best for the years to come, both in life and in science.

Tarzan

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A. Books

5. A. Ehrenfeucht, T. Harju, G. Rozenberg: *The Theory of 2-structures – A Framework for Decomposition and Transformation of Graphs*, World Scientific, 1999.
4. G. Paun, G. Rozenberg, A. Salomaa: *DNA Computing - New Computing Paradigms*, Texts in Theoretical Computer Science - An EATCS Series, Springer-Verlag, 1998.
3. G. Rozenberg, A. Salomaa: *Cornerstones of Undecidability*, International Series in Computer Science, Prentice Hall, 1994.
2. G. Rozenberg, A. Salomaa: *The Mathematical Theory of L Systems*, Academic Press, 1980.
1. G.T. Herman, G. Rozenberg: *Developmental Systems and Languages*, North-Holland/American Elsevier, Amsterdam, 1975.

B. Edited Books

51. G.A. Agha, F. De Cindio, G. Rozenberg (Eds.): *Concurrent Object-Oriented Programming and Petri Nets (Advances in Petri Nets)*, Lecture Notes in Computer Science **2001**, Springer-Verlag, 2001.
50. A. Condon, G. Rozenberg (Eds.): *DNA Computing - 6th International Workshop on DNA-based Computers, DNA 2000, Leiden, The Netherlands*, Lecture Notes in Computer Science **2054**, Springer-Verlag, 2001.
49. G. Paun, G. Rozenberg, A. Salomaa (Eds.): *Current Trends in Theoretical Computer Science – Entering the 21st Century*, World Scientific, 2001.
48. H. Ehrig, G. Engels, H.-J. Kreowski, G. Rozenberg (Eds.): *Theory and Applications of Graph Transformations, 6th International Workshop, TAGT'98*, Lecture Notes in Computer Science **1764**, Springer-Verlag, 2000.
47. G. Rozenberg, W. Thomas (Eds.): *Developments in Language Theory, Foundations, Applications, and Perspectives*, World Scientific, 2000.
46. J. Billington, M. Diaz, G. Rozenberg (Eds.): *Application of Petri Nets to Communication Networks (Advances in Petri Nets)*, Lecture Notes in Computer Science **1605**, Springer-Verlag, 1999.
45. H. Ehrig, H.-J. Kreowski, U. Montanari, G. Rozenberg (Eds.): *Handbook of Graph Grammars and Computing by Graph Transformation, Volume 3: Concurrency, Parallelism, and Distribution*, World Scientific, 1999.
44. J. Karhumäki, H. Maurer, G. Paun, G. Rozenberg (Eds.): *Jewels Are Forever, Contributions to Theoretical Computer Science in Honor of Arto Salomaa*, Springer-Verlag, 1999.

43. J. Karhumäki, A. Mateescu, G. Rozenberg (Eds.) Special Issue of Fundamenta Informaticae Dedicated to Arto Salomaa, 38, 1999.
42. W. Reisig, G. Rozenberg (Eds.): *Lectures on Petri Nets, I: Basic Models (Advances in Petri Nets)*, Lecture Notes in Computer Science **1491**, Springer-Verlag, 1998.
41. W. Reisig, G. Rozenberg (Eds.): *Lectures on Petri Nets, II: Applications (Advances in Petri Nets)*, Lecture Notes in Computer Science **1492**, Springer-Verlag, 1998.
40. G. Rozenberg, F. Vaandrager (Eds.): *Lectures on Embedded Systems*, Lecture Notes in Computer Science **1494**, Springer-Verlag, 1998.
39. J. Mycielski, G. Rozenberg, A. Salomaa (Eds.): *Structures in Logic and Computer Science - A Selection of Essays in Honor of A. Ehrenfeucht*, Lecture Notes in Computer Science **1261**, Springer-Verlag, 1997.
38. G. Rozenberg (Ed.): *Handbook of Graph Grammars and Computing by Graph Transformation, Volume 1: Foundations*, World Scientific, 1997.
37. G. Rozenberg, A. Salomaa (Eds.): *Handbook of Formal Languages, Volume 1: Word, Language, Grammar*, Springer-Verlag, 1997.
36. G. Rozenberg, A. Salomaa (Eds.): *Handbook of Formal Languages, Volume 2: Linear Modelling: Background and Application*, Springer-Verlag, 1997.
35. G. Rozenberg, A. Salomaa (Eds.): *Handbook of Formal Languages, Volume 3: Beyond Words*, Springer-Verlag, 1997.
34. G. Rozenberg, A. Salomaa (Eds.): *Special Issue on Formal Language Theory*, Theoretical Computer Science **183**, 1997.
33. J. Cuny, H. Ehrig, G. Engels, G. Rozenberg (Eds.): *Graph Grammars and Their Application to Computer Science*, Lecture Notes in Computer Science **1073**, Springer-Verlag, 1996.
32. G. Rozenberg (Ed.): *Special Issue on Petri Nets*, Theoretical Computer Science **153**, Springer-Verlag, 1996.
31. G. Rozenberg (Ed.): *Special Issue on Formal Language Theory*, Fundamenta Informaticae **25**(3,4), 1996.
30. J. Dassow, G. Rozenberg, A. Salomaa (Eds.): *Developments in Language Theory II - At the Crossroads of Mathematics, Computer Science and Biology*, World Scientific, 1995.
29. V. Diekert, G. Rozenberg (Eds.): *The Book of Traces*, World Scientific, 1995.
28. J.W. de Bakker, W.-P. de Roever, G. Rozenberg (Eds.): *A Decade of Concurrency, Reflections and Perspectives*, Lecture Notes in Computer Science **803**, Springer-Verlag, 1994.
27. J. Karhumäki, H. Maurer, G. Rozenberg (Eds.): *Results and Trends in Theoretical Computer Science, Colloquium in Honor of Arto Salomaa, Graz, Austria*, Lecture Notes in Computer Science **812**, Springer-Verlag, 1994.

26. E. Best, G. Rozenberg (Eds.): *Special Issue of Selected Papers of the Third Workshop on Concurrency and Compositionality, Goslar, Germany, March 1991*, Theoretical Computer Science **114** (1), June 1993.
25. B. Courcelle, G. Rozenberg (Eds.): *Special Issue of Selected Papers of the International Workshop on Computing by Graph Transformation, Bordeaux, France, 1991*, Theoretical Computer Science **109** (1-2), March 1993.
24. G. Rozenberg (Ed.): *Advances in Petri Nets 1992*, Lecture Notes in Computer Science **609**, Springer-Verlag, Berlin, 1993.
23. G. Rozenberg, A. Salomaa (Eds.): *Current Trends in Theoretical Computer Science, Essays and Tutorials*, Series in Computer Science **40**, World Scientific Publishing, Singapore, 1993.
22. A. Salomaa, G. Rozenberg (Eds.): *Developments in Language Theory - At the Crossroads of Mathematics, Computer Science and Biology*, World Scientific, 1993.
21. G. Rozenberg, A. Salomaa (Eds.): *Lindenmayer Systems*, Springer-Verlag, 1992.
20. J.W. de Bakker, W.P. de Roever, G. Rozenberg (Eds.): *Foundations of Object-Oriented Languages (REX School/Workshop, Noordwijkerhout)*, Lecture Notes in Computer Science **489**, Springer-Verlag, Berlin, 1991.
19. H. Ehrig, H.-J. Kreowski, G. Rozenberg (Eds.): *Graph Grammars and Their Application to Computer Science (4th International Workshop, Bremen, Germany)*, Lecture Notes in Computer Science **532**, Springer-Verlag, Berlin, 1991.
18. K. Jensen, G. Rozenberg (Eds.): *High-Level Petri Nets, Theory and Applications*, Springer-Verlag, Berlin, 1991.
17. G. Rozenberg (Ed.): *Advances in Petri Nets 1991*, Lecture Notes in Computer Science **524**, Springer-Verlag, Berlin, 1991.
16. G. Rozenberg (Ed.): *Advances in Petri Nets 1990*, Lecture Notes in Computer Science **483**, Springer-Verlag, Berlin, 1991.
15. J.W. de Bakker, W.-P. de Roever, G. Rozenberg (Eds.): *Stepwise Refinement of Distributed Systems; Models, Formalisms, Correctness, REX Workshop, May/June 1989*, Lecture Notes in Computer Science **430**, Springer-Verlag, Berlin, 1990.
14. G. Rozenberg (Ed.): *Advances in Petri Nets 1989*, Lecture Notes in Computer Science **424**, Springer-Verlag, Berlin, 1990.
13. W. Brauer, W. Reisig, G. Rozenberg (Eds.): *Petri Nets: Central Models and Their Properties - Advances in Petri Nets 1986, Part I*, Lecture Notes in Computer Science **254**, Springer-Verlag, 1987.
12. W. Brauer, W. Reisig, G. Rozenberg (Eds.): *Petri Nets: Applications and Relationships to Other Models of Concurrency - Advances in Petri Nets 1986, Part II*, Lecture Notes in Computer Science **255**, Springer-Verlag, 1987.

11. H. Ehrig, M. Nagl, G. Rozenberg, A. Rosenfeld (Eds.): *Graph-Grammars and Their Application to Computer Science*, Lecture Notes in Computer Science **291**, Springer-Verlag, 1987.
10. G. Rozenberg (Ed.): *Advances in Petri Nets 1987*, Lecture Notes in Computer Science **266**, Springer-Verlag, 1987.
9. K. Voss, H.J. Genrich, G. Rozenberg (Eds.): *Concurrency and Nets*, Springer-Verlag, 1987.
8. J.W. de Bakker, W.P. de Roever, G. Rozenberg (Eds.): *Current Trends in Concurrency*, Lecture Notes in Computer Science **224**, Springer-Verlag, 1986.
7. G. Rozenberg (Ed.): *Advances in Petri Nets 1985*, Lecture Notes in Computer Science, Springer-Verlag, 1986.
6. A. Salomaa, G. Rozenberg (Eds.): *The Book of L*, Springer-Verlag, 1986.
5. H. Ehrig, M. Nagl, G. Rozenberg (Eds.): *Graph-Grammars and Their Application to Computer Science*, Lecture Notes in Computer Science **153**, Springer-Verlag, 1983.
4. A. Pagnoni, G. Rozenberg (Eds.): *Applications and Theory of Petri Nets*, Informatik Fachberichte **66**, Springer-Verlag, 1983.
3. V. Claus, H. Ehrig, G. Rozenberg (Eds.): *Proceedings of the International Workshop on Graph Grammars and Their Application to Computer Science and Biology*, Lecture Notes in Computer Science **73**, Springer-Verlag, 1978.
2. A. Lindenmayer, G. Rozenberg (Eds.): *Automata, Languages, Development*, North-Holland, Amsterdam, 1976.
1. G. Rozenberg, A. Salomaa (Eds.): *L Systems*, Lecture Notes in Computer Science **15**, 1974.

C. Papers

349. Team Automata for CSCW, in: Proceedings of the 2nd International Colloquium on Petri Net Technologies for Modelling Communication Based Systems (H. Weber, H. Ehrig, W. Reisig, Eds.), Fraunhofer Institute for Software and Systems Engineering, Berlin, Germany, 1–20 (with M.H. ter Beek, C.A. Ellis, J. Kleijn), 2001.
348. Team Automata for Spatial Access Control, in: Proceedings of the 7th European Conference on Computer-Supported Cooperative Work (ECSCW 2001), Bonn, Germany, 2001 (W. Prinz, M. Jarke, Y. Rogers, K. Schmidt, V. Wulf, Eds.), Kluwer Academic Publishers, Dordrecht, 59–77 (with M.H. ter Beek, C.A. Ellis, J. Kleijn), 2001.
347. Synchronizations in Team Automata for Groupware Systems, Computer Supported Cooperative Work, (with M.H. ter Beek, C.A. Ellis, J. Kleijn), 2001.
346. Sequences of Languages in Forbidding-Enforcing Families, Soft Computing **5**, 121–125 (with A. Ehrenfeucht, H.J. Hoogeboom, N. van Vugt), 2001.

345. Formal Properties of PA-matching, *Theoretical Computer Science* **262**, 117–131 (with S. Kobayashi, V. Mitrana, G. Paun), 2001.
344. String Tile Models for DNA Computing by Self-assembly, *Lecture Notes in Computer Science* **2054**, 63–88, Springer-Verlag (with E. Winfree, T. Eng), 2001.
343. Pancyclicity of Switching Classes, *Information Processing Letters* **73**, 153–156 (with A. Ehrenfeucht, J. Hage, T. Harju), 2000.
342. Complexity Issues in Switching of Graphs, *Lecture Notes in Computer Science* **1764**, 59–70, Springer-Verlag (with A. Ehrenfeucht, J. Hage, T. Harju), 2000.
341. Forbidding and Enforcing, in: *DNA Based Computers V* (E. Winfree, D. Gifford, Eds.), DIMACS Series in Discrete Mathematics and Theoretical Computer Science **54**, 195–206 (with A. Ehrenfeucht, H.J. Hoogeboom, N. van Vugt), 2000.
340. Universal and Simple Operations for Gene Assembly in Ciliates, in: *Where Mathematics, Computer Science and Biology Meet* (C. Martín-Vide, V. Mitrana, Eds.), Kluwer Academic Publishers, 329–342 (with A. Ehrenfeucht, I. Petre, D.M. Prescott), 2000.
339. Double-Pullback Graph Transitions: A Rule-Based Framework with Incomplete Information, *Lecture Notes in Computer Science* **1764**, 85–102, Springer-Verlag (with H. Ehrig, R. Heckel, M. Llabrés, F. Orejas, J. Padberg), 2000.
338. Computing with DNA by Operating on Plasmids, *Biosystems* **57**, 87–93 (with T. Head, R.S. Bladergroen, C.K.D. Breck, P.H.M. Lommerse, H.P. Spaink), 2000.
337. On Strongly Context-Free Languages, *Discrete Applied Mathematics* **103**, 153–165 (with L. Ilie, G. Paun, A. Salomaa), 2000.
336. A Characterization of Poly-slender Context-Free Languages, *R.A.I.R.O. – Informatique Théorique et Applications* **34**, 77–86 (with L. Ilie, I. Petre), 2000.
335. Uniformly Scattered Factors, in: *Finite VS Infinite, Contributions to an Eternal Dilemma* (C. Calude, G. Paun, Eds.), *Discrete Mathematics and Theoretical Computer Science* **243**, Springer-Verlag, London UK, 187–198 (with L. Ilie, I. Petre), 2000.
334. Membrane Computing with External Output, *Fundamenta Informaticae* **41**, 313–340 (with G. Paun, A. Salomaa), 2000.
333. Cross-Fertilization between Evolutionary Computing and DNA-based Computing, in: *Proceedings of the 1999 Congress on Evolutionary Computing*, 980–987 (with T. Bäck, J.N. Kok), 1999.
332. Watson-Crick Finite Automata, in: *3rd DIMACS Workshop on DNA Based Computers* (H. Rubin, D.H. Wood, Eds.), DIMACS Series in Discrete Mathematics **48**, 297–327 (with R. Freund, G. Paun, A. Salomaa), 1999.

331. Contexts on Trajectories, *International Journal of Computer Mathematics* **73**, 15–36 (with C. Martín-Vide, A. Mateescu, A. Salomaa), 1999.
330. X-Families: An Approach to the Study of Families of Syntactically Similar Languages, in: *Issues in Mathematical Linguistics* (C. Martín-Vide, Ed.), *Studies in Functional and Structural Linguistics* **47**, John Benjamins, Amsterdam, 145–163 (with C. Martín-Vide, G. Paun, A. Salomaa), 1999.
329. Some Properties of Duplication Grammars, *Acta Cybernetica* **14**, 165–177 (with V. Mitrana), 1999.
328. DNA Computing: New Ideas and Paradigms, *Lecture Notes in Computer Science* **1644**, 106–118, Springer-Verlag (with A. Salomaa), 1999.
327. Permutations, Parenthesis Words, and Schroeder Numbers, *Discrete Mathematics* **190**, 259–264 (with A. Ehrenfeucht, T. Harju, P. ten Pas), 1998.
326. On Representing Recursively Enumerable Languages by Internal Contextual Languages, *Theoretical Computer Science* **205**, 61–83 (with A. Ehrenfeucht, G. Paun), 1998.
325. Bidirectional Sticker Systems, in: *Pacific Symposium on Biocomputing* (R.B. Altman, A.K. Dunker, L. Hunter, T.E. Klein, Eds.), v. 3, World Scientific, Singapore, 535–546 (with R. Freund, G. Paun, A. Salomaa), 1998.
324. DNA Computing, Sticker Systems, and Universality, *Acta Informatica* **35**, 401–420 (with L. Kari, G. Paun, A. Salomaa, S. Yu), 1998.
323. Universality Results for Finite H Systems and Watson-Crick Finite Automata, in: *Computing with Bio-Molecules, Theory and Experiments* (G. Paun, Ed.), Springer-Verlag, Singapore, 200–220 (with C. Martín-Vide, G. Paun, A. Salomaa), 1998.
322. Simple Splicing Systems, *Discrete Applied Mathematics* **84**, 145–163 (with A. Mateescu, G. Paun, A. Salomaa), 1998.
321. Characterizations of RE Languages Starting from Internal Contextual Languages, *International Journal of Computer Mathematics* **66**, 179–197 (with A. Mateescu, G. Paun, A. Salomaa), 1998.
320. Shuffle on Trajectories: Syntactic Constraints (Fundamental Study), *Theoretical Computer Science* **197**, 1–56 (with A. Mateescu, A. Salomaa), 1998.
319. Sticker Systems, *Theoretical Computer Science* **204**, 183–203 (with G. Paun), 1998.
318. Complementarity versus Universality: Keynotes of DNA Computing, *Complexity* **4**, 14–19 (with G. Paun, A. Salomaa), 1998.
317. Elementary Net Systems, *Lecture Notes in Computer Science* **1491**, 12–121, Springer-Verlag (with J. Engelfriet), 1998.
316. Grammar Systems, in: *Handbook of Formal Languages, Volume 2: Linear Modelling: Background and Application* (G. Rozenberg, A. Salomaa, Eds.), Springer-Verlag, 155–213 (with J. Dassow, G. Paun), 1997.
315. 2-structures – A Framework for Decomposition and Transformation of Graphs, in: *Handbook of Graph Grammars and Computing by Graph*

- Transformation, Volume 1: Foundations (G. Rozenberg, Ed.), World Scientific, 401–478 (with A. Ehrenfeucht, T. Harju), 1997.
314. Invariants of Inversive 2-structures on Groups of Labels, *Mathematical Structures in Computer Science* **7**, 303–327 (with A. Ehrenfeucht, T. Harju), 1997.
313. Semantics of Nonsequential Tree-Based Computation Schemes, *Fundamenta Informaticae* **29**, 305–324 (with A. Ehrenfeucht, K. Salomaa), 1997.
312. Node Replacement Graph Grammars, in: *Handbook of Graph Grammars and Computing by Graph Transformation, Volume 1: Foundations* (G. Rozenberg, Ed.), World Scientific, 1–94 (with J. Engelfriet), 1997.
311. L Systems, in: *Handbook of Formal Languages, Volume 1: Word, Language, Grammar* (G. Rozenberg, A. Salomaa, Eds.), Springer-Verlag, 253–328 (with L. Kari, A. Salomaa), 1997.
310. Shuffle-like Operations on Omega-Words, *Lecture Notes in Computer Science* **1218**, 395–411, Springer-Verlag (with A. Mateescu, G.R. Mateescu, A. Salomaa), 1997.
309. Geometric Transformations of Language Families: The Power of Symmetry, *International Journal of Foundations of Computer Science* **8**, 1–14 (with A. Mateescu, A. Salomaa), 1997.
308. Syntactic and Semantic Aspects of Parallellism, *Lecture Notes in Computer Science* **1337**, 79–105, Springer-Verlag (with A. Mateescu, A. Salomaa), 1997.
307. Contextual Grammars and Formal Languages, in: *Handbook of Formal Languages, Volume 2: Linear Modelling: Background and Application* (G. Rozenberg, A. Salomaa, Eds.), Springer-Verlag, 237–293 (with G. Paun), 1997.
306. Computing by Splicing: Programmed and Evolving Splicing Systems, in: *Proceedings of the 1997 IEEE International Conference on Evolutionary Computation (ICEC'97)*, 273–278 (with G. Paun, A. Salomaa), 1997.
305. Finite Languages for the Representation of Finite Graphs, *Journal of Computer and System Sciences* **52**, 170–184 (with A. Ehrenfeucht, J. Engelfriet), 1996.
304. Group Based Graph Transformations and Hierarchical Representations of Graphs, *Lecture Notes in Computer Science* **1073**, 502–520, Springer-Verlag (with A. Ehrenfeucht, T. Harju), 1996.
303. On Representing RE Languages by One-Sided Internal Contextual Languages, *Acta Cybernetica* **12**, 217–233 (with A. Ehrenfeucht, A. Mateescu, Gh. Paun, A. Salomaa), 1996.
302. A Note on Binary Grammatical Codes of Trees, *Theoretical Computer Science* **155**, 425–438 (with A. Ehrenfeucht, P. ten Pas), 1996.
301. Linear Landscape of External Contextual Languages, *Acta Informatica* **33**, 571–594 (with A. Ehrenfeucht, G. Paun), 1996.

300. Characterization and Complexity of Uniformly Nonprimitive Labeled 2-structures, *Theoretical Computer Science* **154**, 247–282 (with J. Engelfriet, T. Harju, A. Proskurowski), 1996.
299. Pattern Systems, *Theoretical Computer Science* **154**, 183–201 (with V. Mitrana, Gh. Paun, A. Salomaa), 1996.
298. Computing by Splicing, *Theoretical Computer Science* **168**, 321–336 (with G. Paun, A. Salomaa), 1996.
297. Pattern Grammars, *Journal of Automata, Languages and Combinatorics* **1**, 219–235 (with G. Paun, A. Salomaa), 1996.
296. Restricted Use of the Splicing Operation, *International Journal of Computer Mathematics* **60**, 17–32 (with G. Paun, A. Salomaa), 1996.
295. Contextual Grammars: Parallellism and Blocking of Derivation, *Fundamenta Informaticae* **25**, 381–398 (with G. Paun, A. Salomaa), 1996.
294. Contextual Grammars: Deterministic Derivations and Growth Functions, *Revue Roumaine de Mathématiques Pures et Appliquées* **41**, 83–108 (with G. Paun, A. Salomaa), 1996.
293. Grammatical Codes of Trees and Terminally Coded Grammars, *Fundamenta Informaticae* **23**, 1–33 (with A. Ehrenfeucht, J. Engelfriet, P. ten Pas), 1995.
292. On the Generative Capacity of Certain Classes of Contextual Grammars, in: *Mathematical Linguistics and Related Topics* (G. Paun, Ed.), Editura Academiei, 105–118 (with A. Ehrenfeucht, L. Ilie, G. Paun, A. Salomaa), 1995.
291. Dynamic Change within Workflow Systems, in: *Proceedings of the ACM Conference on Organisational Computing Systems*, 10–21 (with C.A. Ellis, K. Keddera), 1995.
290. Dependence Graphs, in: *The Book of Traces*, World Scientific, 43–68 (with H.J. Hoogeboom), 1995.
289. Generalised DOL Trees, *Acta Cybernetica* **12**, 1–9 (with L. Kari, A. Salomaa), 1995.
288. Parikh Prime Words and GO-like Territories, *Journal of Universal Computer Science* **1**, 790–810 (with A. Mateescu, G. Paun, A. Salomaa), 1995.
287. Transition Systems, Event Structures and Unfoldings, *Information and Computation* **118**, 191–207 (with M. Nielsen, P.S. Thiagarajan), 1995.
286. Grammars Based on the Shuffle Operation, *Journal of Universal Computer Science* **1**, 67–82 (with G. Paun, A. Salomaa), 1995.
285. Clans and Regions in 2-structures, *Theoretical Computer Science* **129**, 207–262 (with A.H. Deutz, A. Ehrenfeucht), 1994.
284. Hyperedge Channels Are Abelian, *Theoretical Computer Science* **127**, 387–393 (with A.H. Deutz, A. Ehrenfeucht), 1994.
283. Quotients and Plane Trees of Group Labeled 2-structures, in: *GRAGRA'94 Proceedings*, 247–251 (with A. Ehrenfeucht, T. Harju), 1994.

282. Incremental Construction of 2-structures, *Discrete Mathematics* **128**, 113–141 (with A. Ehrenfeucht, T. Harju), 1994.
281. An Introduction to Context-Free Text Grammars, in: *Developments in Language Theory*, World Scientific, 357–369 (with A. Ehrenfeucht, H.J. Hoogeboom, P. ten Pas), 1994.
280. Combinatorial Properties of Dependence Graphs, *Information and Computation* **114**, 315–328 (with A. Ehrenfeucht, H.J. Hoogeboom), 1994.
279. On the Generative Capacity of Certain Classes of Contextual Grammars, in: *Mathematical Linguistics and Related Topics*, The Publishing House of the Romanian Academy of Sciences, Bucharest, 105–118 (with A. Ehrenfeucht, L. Ilie, G. Paun, A. Salomaa), 1994.
278. Properties of Grammatical Codes of Trees, *Theoretical Computer Science* **125**, 259–293 (with A. Ehrenfeucht, P. ten Pas), 1994.
277. Context-Free Text Grammars, *Acta Informatica* **31**, 161–206 (with A. Ehrenfeucht, P. ten Pas), 1994.
276. Normal Forms for Contextual Grammars, in: *Mathematical Aspects of Natural and Formal Languages* (G. Paun, Ed.), World Scientific Series in Computer Science, v. 43, World Scientific Publishing, 79–95 (with A. Ehrenfeucht, G. Paun), 1994.
275. Dynamic Labeled 2-structures, *Mathematical Structures in Computer Science* **4**, 433–455 (with A. Ehrenfeucht), 1994.
274. Dynamic Labeled 2-structures with Variable Domains, *Lecture Notes in Computer Science* **812**, 97–123, Springer-Verlag (with A. Ehrenfeucht), 1994.
273. Square Systems, *Fundamenta Informaticae* **20**, 75–111 (with A. Ehrenfeucht), 1994.
272. Semantics of Trees, *Mathematical Systems Theory* **27**, 159–181 (with A. Ehrenfeucht, K. Salomaa), 1994.
271. Reductions for Primitive 2-structures, *Fundamenta Informaticae* **20**, 133–144 (with T. Harju), 1994.
270. Decomposition of Infinite Labeled 2-structures, *Lecture Notes in Computer Science* **812**, 145–158, Springer-Verlag (with T. Harju), 1994.
269. Structuring Grammar Systems by Priorities and Hierarchies, *Acta Cybernetica* **11**, 189–204 (with V. Mitrana, G. Paun), 1994.
268. Prescribed Teams of Grammars, *Acta Informatica* **31**, 525–537 (with G. Paun), 1994.
267. Marcus Contextual Grammars: Modularity and Leftmost Derivations, in: *Mathematical Aspects of Natural and Formal Languages* (G. Paun, Ed.), World Scientific Publishing, 375–392 (with G. Paun, A. Salomaa), 1994.
266. Contextual Grammars: Erasing Determinism, One-Sided Contexts, in: *Developments in Language Theory*, World Scientific, 370–388 (with G. Paun, A. Salomaa), 1994.

265. Handle-Rewriting Hypergraph Grammars, *Journal of Computer and System Sciences* **46**, 218–270 (with B. Courcelle, J. Engelfriet), 1993.
264. On the Structure of Recognizable Languages of Dependence Graphs, *R.A.I.R.O. – Informatique Théorique et Applications* **27**, 7–22 (with A. Ehrenfeucht, H.J. Hoogeboom), 1993.
263. Combinatorial Properties of Texts, *R.A.I.R.O. – Informatique Théorique et Applications* **27**, 433–464 (with A. Ehrenfeucht, P. ten Pas), 1993.
262. T-structures, T-functions and Texts, *Theoretical Computer Science* **116**, 227–290 (with A. Ehrenfeucht), 1993.
261. An Introduction to Dynamic Labeled 2-structures, *Lecture Notes in Computer Science* **711**, 156–173, Springer-Verlag (with A. Ehrenfeucht), 1993.
260. Permutable Transformation Semigroups, *Semigroup Forum* **47**, 123–125 (with T. Harju), 1993.
259. Computation Graphs for Actor Grammars, *Journal of Computer and System Sciences* **46**, 60–90 (with D. Janssens, M. Lens), 1993.
258. Angular 2-structures, *Theoretical Computer Science* **92**, 227–248 (with A. Ehrenfeucht), 1992.
257. Elementary Transition Systems and Refinement, *Acta Informatica* **29**, 555–578 (with M. Nielsen, P.S. Thiagarajan), 1992.
256. Elementary Transition Systems, *Theoretical Computer Science* **96**, 3–33 (with M. Nielsen, P.S. Thiagarajan), 1992.
255. A Survey of Equivalence Notions for Net Based Systems, *Lecture Notes in Computer Science* **609**, 410–472, Springer-Verlag (with L. Pomello, C. Simone), 1992.
254. Context-Free Handle-Rewriting Hypergraph Grammars, *Lecture Notes in Computer Science* **532**, 253–268, Springer-Verlag (with B. Courcelle, J. Engelfriet), 1991.
253. Grammatical Codes of Trees, *Discrete Applied Mathematics* **32**, 103–129 (with A. Ehrenfeucht), 1991.
252. Net-Based Description of Parallel Object-Based Systems, or POTs and POPs, *Lecture Notes in Computer Science* **489**, 229–273, Springer-Verlag (with J. Engelfriet, G. Leih), 1991.
251. Nonterminal Separation in Graph Grammars, *Theoretical Computer Science* **82**, 95–111 (with J. Engelfriet, G. Leih), 1991.
250. Graph Grammars Based on Node Rewriting: An Introduction to NLC Graph Grammars, *Lecture Notes in Computer Science* **532**, 12–23, Springer-Verlag (with J. Engelfriet), 1991.
249. Diamond Properties of Elementary Net Systems, *Fundamenta Informaticae* **XIV**, 287–300 (with H.J. Hoogeboom), 1991.
248. Structured Transformations and Computation Graphs for Actor Grammars, *Lecture Notes in Computer Science* **532**, 446–460, Springer-Verlag (with D. Janssens), 1991.

247. Vector Controlled Concurrent Systems, Part II: Comparisons, *Fundamenta Informaticae* XIV, 1–38 (with N.W. Keesmaat, H.C.M. Kleijn), 1991.
246. Labeled 2-structures, *Lecture Notes in Computer Science* **555**, 268–282, Springer-Verlag, 1991.
245. Post Correspondence Problem, in: *Encyclopedia of Mathematics*, v. 7, Kluwer Academic Publishers, 252–253 (with A. Salomaa), 1991.
244. The Complexity of Regular DNLC Graph Languages, *Journal of Computer and System Sciences* **40**, 376–404 (with IJ.J. Aalbersberg, J. Engelfriet), 1990.
243. A Characterization of Set Representable Labeled Partial 2-structures through Decompositions, *Acta Informatica* **28**, 83–94 (with A. Ehrenfeucht), 1990.
242. A Theory of 2-structures, Part I: Clans, Basic Subclasses, and Morphisms (Fundamental Study), *Theoretical Computer Science* **70**, 277–303 (with A. Ehrenfeucht), 1990.
241. Theory of 2-structures, Part II: Representation through Labeled Tree Families (Fundamental Study), *Theoretical Computer Science* **70**, 305–342 (with A. Ehrenfeucht), 1990.
240. Primitivity Is Hereditary for 2-structures (Fundamental Study), *Theoretical Computer Science* **70**, 343–358 (with A. Ehrenfeucht), 1990.
239. Partial (Set) 2-structures, Part I: Basic Notions and the Representation Problem, *Acta Informatica* **27**, 315–342 (with A. Ehrenfeucht), 1990.
238. Partial (Set) 2-structures, Part II: State Spaces of Concurrent Systems, *Acta Informatica* **27**, 343–368 (with A. Ehrenfeucht), 1990.
237. Formalizing the Behaviour of Parallel Object-Based Systems by Petri Nets, in: *Semantics for Concurrency* (M.Z. Kwiatkowska, M.W. Shields, R.M. Thomas, Eds.), *Workshops on Computing*, Springer-Verlag, Berlin, 204–221 (with J. Engelfriet, G. Leih), 1990.
236. A Comparison of Boundary Graph Grammars and Context-Free Hypergraph Grammars, *Information and Computation* **84**, 163–206 (with J. Engelfriet), 1990.
235. Vector Controlled Concurrent Systems; Part I: Basic Classes, *Fundamenta Informaticae* XIII, 275–316 (with N.W. Keesmaat, H.C.M. Kleijn), 1990.
234. On Structured Graph Grammars; I, *Information Sciences* **52**, 185–210 (with H.-J. Kreowski), 1990.
233. On Structured Graph Grammars; II, *Information Sciences* **52**, 221–246 (with H.-J. Kreowski), 1990.
232. Edge-Label Controlled Graph Grammars, *Journal of Computer and System Sciences* **40**, 188–228 (with M.G. Main), 1990.
231. Behavioural Notions for Elementary Net Systems, *Distributed Computing* **4**, 45–57 (with M. Nielsen, P.S. Thiagarajan), 1990.

230. Mathematical Theory of Computation, in: Encyclopedia of Mathematics, v. 6, Kluwer Academic Publishers, 146–148 (with A. Salomaa), 1990.
229. L-systems, in: Encyclopedia of Mathematics, v. 5, Kluwer Academic Publishers, 325–327 (with A. Salomaa), 1990.
228. Cryptography, in: Encyclopedia of Mathematics, v. 2, Kluwer Academic Publishers, 466–468 (with A. Salomaa), 1990.
227. Complexity Theory, in: Encyclopedia of Mathematics, v. 2, Kluwer Academic Publishers, 280–283 (with A. Salomaa), 1990.
226. Clans and the Complexity of Dependence Graphs, in: A Perspective in Computer Science (R. Narasimhan, Ed.), World Scientific Publishing, 33–37 (with A. Ehrenfeucht), 1989.
225. A Characterization of State Spaces of Elementary Net Systems, in: J.W. de Bakker, 25 jaar semantiek, Liber Amicorum, C.W.I. Amsterdam, 193–201 (with A. Ehrenfeucht), april 1989.
224. Actor Grammars, Mathematical Systems Theory **22**, 75–107 (with D. Janssens), 1989.
223. Theory of Traces, Theoretical Computer Science **60**, 1–82 (with IJ.J. Aalbersberg), 1988.
222. Recording the Use of Memory in Right-Boundary Grammars and Push-Down Automata, Acta Informatica **25**, 203–23 (with A. Ehrenfeucht, H.J. Hoogeboom), 1988.
221. Apex Graph Grammars and Attribute Grammars, Acta Informatica **25**, 537–571 (with J. Engelfriet, G. Leih), 1988.
220. Restricting the Complexity of Regular DNLC Languages, Lecture Notes in Computer Science **291**, 147–166, Springer-Verlag (with IJ.J. Aalbersberg, J. Engelfriet), 1987.
219. On the Structure of Dependency Graphs, in: Concurrency and Nets (K. Voss, H.J. Genrich, G. Rozenberg, Eds.), Springer-Verlag, 141–170 (with A. Ehrenfeucht), 1987.
218. Apex Graph Grammars, Lecture Notes in Computer Science **291**, 167–185, Springer-Verlag (with J. Engelfriet, G. Leih), 1987.
217. Basic Notions of Actor Grammars, Lecture Notes in Computer Science **291**, 280–298, Springer-Verlag (with D. Janssens), 1987.
216. Handle NLC-grammars and RE Languages, Journal of Computer and System Sciences **35**, 192–205 (with M.G. Main), 1987.
215. Fundamentals of Edge-Label Controlled Graph Grammars, Lecture Notes in Computer Science **291**, 411–426, Springer-Verlag (with M.G. Main), 1987.
214. Behaviour of Elementary Net Systems, Lecture Notes in Computer Science **254**, 60–95, Springer-Verlag, 1987.
213. An Introduction to the NLC Way of Rewriting Graphs, Lecture Notes in Computer Science **291**, 55–66, Springer-Verlag, 1987.

212. Combinatorial Properties of Boundary NLC Grammars, *Discrete Applied Mathematics* **16**, 59–73 (with E. Welzl), 1987.
211. On the Membership Problem for Regular DNLC Grammars, *Discrete Applied Mathematics* **13**, 79–85 (with IJ.J. Aalbersberg, A. Ehrenfeucht), 1986.
210. Coordinated Pair Systems; Part I: Dyck Words and Classical Pumping, *R.A.I.R.O. – Informatique Théorique et Applications* **20**, 405–424 (with A. Ehrenfeucht, H.J. Hoogeboom), 1986.
209. Coordinated Pair Systems; Part II: Sparse Structure of Dyck Words and Ogden’s Lemma, *R.A.I.R.O. – Informatique Théorique et Applications* **20**, 425–439 (with A. Ehrenfeucht, H.J. Hoogeboom), 1986.
208. On the Active and Full Use of Memory in Right-Boundary Grammars and Push-Down Automata, *Theoretical Computer Science* **48**, 201–228 (with A. Ehrenfeucht, H.J. Hoogeboom), 1986.
207. Computations in Coordinated Pair Systems, *Fundamenta Informaticae IX*, 445–480 (with A. Ehrenfeucht, H.J. Hoogeboom), 1986.
206. Infinitary Languages: Basic Theory and Applications to Concurrent Systems, *Lecture Notes in Computer Science* **224**, Springer-Verlag (with H.J. Hoogeboom), 1986.
205. Neighbourhood-Uniform NLC Grammars, *Computer Vision, Graphics and Image Processing* **35**, 131–151 (with D. Janssens), 1986.
204. The Bounded Degree Problem for NLC Grammars Is Decidable, *Journal of Computer and System Sciences* **33**, 415–422 (with D. Janssens, E. Welzl), 1986.
203. Petri Nets: Basic Notions, Structures, Behaviour, *Lecture Notes in Computer Science* **224**, 585–668, Springer-Verlag (with P.S. Thiagarajan), 1986.
202. Graph Theoretic Closure Properties of the Family of Boundary NLC Graph Languages, *Acta Informatica* **23**, 289–309 (with E. Welzl), 1986.
201. Boundary NLC Graph Grammars - Basic Definitions, Normal Forms, and Complexity, *Information and Control* **69**, 136–167 (with E. Welzl), 1986.
200. CTS Systems and Petri Nets, *Theoretical Computer Science* **40**, 149–162 (with IJ.J. Aalbersberg), 1985.
199. Traces, Dependency Graphs and DNLC Grammars, *Discrete Applied Mathematics* **11**, 299–306 (with IJ.J. Aalbersberg), 1985.
198. On Coordinated Rewriting, *Lecture Notes in Computer Science* **199**, 100–111, Springer-Verlag (with A. Ehrenfeucht, H.J. Hoogeboom), 1985.
197. Adding Global Forbidding Context to Context-Free Grammars, *Theoretical Computer Science* **37**(3), 337–360 (with A. Ehrenfeucht, H.C.M. Kleijn), 1985.
196. Each Regular Code Is Included in a Maximal Regular Code, *R.A.I.R.O. – Informatique Théorique et Applications* **20**, 89–96 (with A. Ehrenfeucht), 1985.

195. Strong Iterative Pairs and the Regularity of Context-Free Languages, R.A.I.R.O. – Informatique Théorique et Applications **19**, 43–56 (with A. Ehrenfeucht), 1985.
194. A Morphic Representation of EOL Languages and Other ETOL Languages, Discrete Applied Mathematics **12**, 115–122 (with A. Ehrenfeucht, K. Ruohonen), 1985.
193. On Coordinated Selective Substitutions: Towards a Unified Theory of Grammars and Machines, Theoretical Computer Science **37**(1), 31–50, 1985.
192. On Erasing in EOL Forms, Discrete Applied Mathematics **12**, 175–190 (with R. Verraedt), 1985.
191. On Ambiguity in D0S Systems, R.A.I.R.O. – Informatique Théorique et Applications **18**, 279–295 (with A. Ehrenfeucht, D. Haussler), 1984.
190. On D0S Languages and D0S Mappings, Semigroup Forum **29**, 123–148 (with A. Ehrenfeucht, D. Haussler, P. Zeiger), 1984.
189. Restrictions on NLC Graph Grammars, Theoretical Computer Science **31**(1-2), 211–223 (with A. Ehrenfeucht, M.G. Main), 1984.
188. On Regularity of Languages Generated by Copying Systems, Discrete Applied Mathematics **8**, 313–317 (with A. Ehrenfeucht), 1984.
187. An Easy Proof of Greibach Normal Form, Information and Control **63**, 190–199 (with A. Ehrenfeucht), 1984.
186. On Inherently Ambiguous EOL Languages, Theoretical Computer Science **28**(1-2), 197–214 (with A. Ehrenfeucht, R. Verraedt), 1984.
185. Generalized Handle Grammars and Their Relation to Petri Nets, Journal of Information Processing and Cybernetics EIK **20**, 179–206 (with H.J. Genrich, D. Janssens, P.S. Thiagarajan), 1984.
184. Direction Independent Context-Sensitive Grammars, Information and Control **63**(1/2), 113–117 (with H.C.M. Kleijn, M. Penttonen, K. Salomaa), 1984.
183. Note on Node-Rewriting Graph Grammars, Information Processing Letters **18**, 21–24 (with H.-J. Kreowski), 1984.
182. Commutative One-Counter Languages Are Regular, Journal of Computer and System Sciences **29**(1), 54–57 (with M. Latteux), 1984.
181. Restricting the In-Out Structure of Petri Nets. A Language Theoretic Point of View, Fundamenta Informaticae VII, 151–190 (with R. Verraedt), 1984.
180. On Simulation and Propagating EOL Forms, Theoretical Computer Science **29**(1-2), 41–48 (with R. Verraedt), 1984.
179. Boundary NLC Grammars, in: Ninth Colloquium on Trees in Algebra and Programming (B. Courcelle, Ed.), Cambridge University Press, 257–270 (with E. Welzl), 1984.
178. Context-Free Normal Systems and ETOL Systems, Journal of Computer and System Sciences **26**, 34–46 (with A. Ehrenfeucht, J. Engelfriet), 1983.

177. On Regularity of Context-Free Languages, *Theoretical Computer Science* **27**, 311–332 (with A. Ehrenfeucht, D. Haussler), 1983.
176. On Binary Equality Sets and a Solution to the Test Conjecture in the Binary Case, *Journal of Algorithms* **85**, 76–85 (with A. Ehrenfeucht, J. Karhumäki), 1983.
175. On the Subword Complexity of Locally Catenative D0L Languages, *Information Processing Letters* **16**(1), 7–9 (with A. Ehrenfeucht), 1983.
174. Repetition of Subwords in D0L Languages, *Information and Control* **59**, 13–35 (with A. Ehrenfeucht), 1983.
173. On the Subword Complexity of m-free D0L Languages, *Information Processing Letters* **17**, 121–124 (with A. Ehrenfeucht), 1983.
172. On the Separating Power of E0L Systems, *R.A.I.R.O. – Informatique Théorique et Applications* **17**, 13–22 (with A. Ehrenfeucht), 1983.
171. P.S. Thiagarajan Petri Nets and Their Relation to Graph Grammars, *LNCS* **153**, 115–129, Springer-Verlag (with H.J. Genrich, D. Janssens), 1983.
170. Constrained Petri Nets, *Fundamenta Informaticae* VI, 81–125 (with H.J.M. Goeman, L.P.J. Groenewegen, H.C.M. Kleijn), 1983.
169. Constrained Petri Nets Part II: Generalizations and Extensions, *Fundamenta Informaticae* VI, 333–374 (with H.J.M. Goeman, L.P.J. Groenewegen, H.C.M. Kleijn), 1983.
168. Closure Properties of Selective Substitution Grammars Part II, *International Journal of Computer Mathematics* **14**, 109–135 (with J. Gonczarowski, H.C.M. Kleijn), 1983.
167. Grammatical Constructions in Selective Substitution Grammars, *Acta Cybernetica* **6**, 239–269 (with J. Gonczarowski, H.C.M. Kleijn), 1983.
166. Closure Properties of Selective Substitution Grammars Part I, *International Journal of Computer Mathematics* **14**, 19–42 (with J. Gonczarowski, H.C.M. Kleijn), 1983.
165. Graph Grammars with Node Label Controlled Rewriting, *Lecture Notes in Computer Science* **153**, 186–205, Springer-Verlag (with D. Janssens), 1983.
164. Hypergraph Systems Generating Graph Languages, *Lecture Notes in Computer Science* **153**, 172–185, Springer-Verlag (with D. Janssens), 1983.
163. Neighbourhood-Uniform NLC Grammars, in: *Proceedings WG'83* (M. Nagl, J. Perl, Eds.), 114–124 (with D. Janssens), 1983.
162. Hypergraph Systems and Their Extensions, *R.A.I.R.O. – Informatique Théorique et Applications* **17**, 163–196 (with D. Janssens), 1983.
161. On the Generative Power of Regular Pattern Grammars, *Acta Informatica* **20**, 391–411 (with H.C.M. Kleijn), 1983.
160. Multigrammars, *International Journal of Computer Mathematics* **12**, 177–201 (with H.C.M. Kleijn), 1983.
159. Chain Code Picture Languages, *Lecture Notes in Computer Science* **153**, 232–244, Springer-Verlag (with H.A. Maurer, E. Welzl), 1983.

158. Subset Languages of Petri Nets. Part II: Closure Properties, *Theoretical Computer Science* **27**, 85–108 (with R. Verraedt), 1983.
157. Subset Languages of Petri Nets. Part I: The Relationship to String Languages and Normal Forms, *Theoretical Computer Science* **26**, 301–326 (with R. Verraedt), 1983.
156. Subset Languages of Petri Nets, in: *Applications and Theory of Petri Nets* (A. Pagnoni, G. Rozenberg, Eds.), *Informatik Fachberichte* **66**, 250–263 (with R. Verraedt), 1983.
155. The Goodness of $\{S,a\}$ -EOL Forms Is Decidable, *Discrete Applied Mathematics* **6**, 263–300 (with R. Verraedt), 1983.
154. Conditions Enforcing Regularity of Context-Free Languages, *Lecture Notes in Computer Science* **140**, 187–191, Springer-Verlag (with A. Ehrenfeucht, D. Haussler), July 1982.
153. The (generalized) Post Correspondence Problem with Lists Consisting of Two Words Is Decidable, *Theoretical Computer Science* **21**(2), 119–144 (with A. Ehrenfeucht, J. Karhumäki), November 1982.
152. Representation Theorems Using DOS Languages, *Theoretical Computer Science* **21**(1), 75–90 (with A. Ehrenfeucht), October 1982.
151. On the Subword Complexity of Homomorphic Images of Languages, *R.A.I.R.O. – Informatique Théorique et Applications* **16**, 303–316 (with A. Ehrenfeucht), 1982.
150. Repetitions in Homomorphisms and Languages, *Lecture Notes in Computer Science* **140**, 192–211, Springer-Verlag (with A. Ehrenfeucht), July 1982.
149. Basic Formulas and Languages, Part II: Applications to EOL Systems and Forms, *Discrete Applied Mathematics* **4**, 11–22 (with A. Ehrenfeucht, R. Verraedt), 1982.
148. Controlled Graph Transformations, in: *Proceedings of the 8th Conference on Graph Theoretic Concepts in Computer Science* (H.J. Schneider, H. Göttler, Eds.), Hanser Verlag, München-Wien, (with H. Ehrig, D. Janssens, H.-J. Kreowski), 1982.
147. Graph Grammars with Neighbourhood-Controlled Embedding, *Theoretical Computer Science* **21**(1), 55–74 (with D. Janssens), October 1982.
146. On Sequential and Parallel Noderewriting Graph Grammars, *Computer Graphics and Image Processing* **18**, 279–304 (with D. Janssens, R. Verraedt), 1982.
145. Corrigendum: Sequential, Continuous and Parallel Grammars, *Information and Control* **52**(3), 364 (with H.C.M. Kleijn), March 1982.
144. On the Role of Blocking in Rewriting Systems, *Acta Cybernetica* **5**, 389–408 (with H.C.M. Kleijn, R. Verraedt), 1982.
143. Using String Languages to Describe Picture Languages, *Information and Control* **54**(3), 155–185 (with H.A. Maurer, E. Welzl), September 1982.
142. Completeness of EOL Forms Is Decidable, *Acta Informatica* **17**, 69–87 (with R. Verraedt), 1982.

141. Subset Languages of Petri Nets, in: Proceedings of the Third Workshop on Applications and Theory of Petri Nets, 407–420 (with R. Verraedt), 1982.
140. Studies in Uniformity, *Information Sciences* **26**, 69–87 (with R. Verraedt), 1982.
139. A Note on the Similarity Depth, *Discrete Applied Mathematics* **4**, 237–241 (with R. Verraedt), 1982 1982.
138. Pumping Lemmas for Regular Sets, *SIAM Journal on Computing* **10**(3), 536–541 (with A. Ehrenfeucht, R. Parikh), August 1981.
137. On the Subword Complexity of Square-Free D0L Languages, *Theoretical Computer Science* **16**, 25–32 (with A. Ehrenfeucht), October 1981.
136. On the Subword Complexity of D0L Languages with a Constant Distribution, *Information Processing Letters* **13**, 108–113 (with A. Ehrenfeucht), December 1981.
135. FP0L Systems Generating Counting Languages, *R.A.I.R.O. – Informatique Théorique et Applications* **15**, 161–173 (with A. Ehrenfeucht), 1981.
134. On the Subword Complexity and Square Freeness of Formal Languages, *LNCS* **104**, 1–4, Springer-Verlag (with A. Ehrenfeucht), 1981.
133. On the (Generalized) Post Correspondence Problem with Lists of Length 2, *Lecture Notes in Computer Science* **115**, 408–416, Springer-Verlag (with A. Ehrenfeucht), July 1981.
132. A Morphic Representation of Complements of Recursively Enumerable Sets, *Journal of the ACM* **28**(4), 706–714 (with A. Ehrenfeucht, K. Ruohonen), October 1981.
131. On ET0L Systems with Finite Tree-Rank, *SIAM Journal on Computing* **10**(1), 40–58 (with A. Ehrenfeucht, D. Vermeir), February 1981.
130. Basic Formulas and Languages, Part I: The Theory, *Discrete Applied Mathematics* **3**, 235–255 (with A. Ehrenfeucht, R. Verraedt), 1981.
129. A Translational Theorem for the Class of EOL Languages, *Information and Control* **50**, 175–183 (with J. Engelfriet), 1981.
128. A Characterization of Context-Free String Languages by Directed Node-Label Controlled Graph Grammars, *Acta Informatica* **16**, 63–85 (with D. Janssens), 1981.
127. Decision Problems for Node Label Controlled Graph Grammars, *Journal of Computer and System Sciences* **22**(2), 144–177 (with D. Janssens), April 1981.
126. On the Role of Selectors in Selective Substitution Grammars, *Lecture Notes in Computer Science* **117**, 190–198, Springer-Verlag (with H.C.M. Kleijn), 1981.
125. Sequential, Continuous and Parallel Grammars, *Information and Control* **48**, 221–260 (with H.C.M. Kleijn), 1981.

124. A General Framework for Comparing Sequential and Parallel Rewriting, Lecture Notes in Computer Science **118**, 360–368, Springer-Verlag (with H.C.M. Kleijn), 1981.
123. Context-Free like Restrictions on Selective Rewriting, Theoretical Computer Science **16**(3), 237–269 (with H.C.M. Kleijn), December 1981.
122. On the Constructive Description of Graph Languages Accepted by Finite Automata., Lecture Notes in Computer Science **118**, 398–409, Springer-Verlag (with H.-J. Kreowski), 1981.
121. Sub Context-Free L Forms, International Journal of Computer Mathematics **9**, 25–41 (with H.A. Maurer), 1981.
120. On Subwords of Formal Languages, Lecture Notes in Computer Science **117**, 328–333, Springer Verlag , 1981.
119. Table Systems with Unconditional Transfer, Discrete Applied Mathematics **3**, 319–322 (with A. Salomaa), 1981.
118. A Hierarchy of ETOL Languages with Rank, Fundamenta Informaticae IV, 197–205 (with D. Vermeir), 1981.
117. EOL Forms and Finite Substitutions of OL Forms, International Journal of Computer Mathematics **10**, 17–34 (with R. Verraedt), 1981.
116. Recursion and Pumping in L Forms, Information Sciences **25**, 43–72 (with R. Verraedt), 1981.
115. On Fixed, Terminal Fixed and Nonterminal Fixed Interpretations of EOL Forms, Information and Control **48**(2), 119–146 (with R. Verraedt), February 1981.
114. On Pure, Terminal Invariant and Nonterminal Invariant Interpretations of EOL Forms, Theoretical Computer Science **14**(3), 267–288 (with R. Verraedt), June 1981.
113. Simple EOL Forms under Uniform Interpretation Generating CF Languages, Fundamenta Informaticae **3**, 141–156 (with J. Albert, H. Maurer, Th. Ottmann), 1980.
112. Continuous Grammars, Information and Control **46**, 71–91 (with A. Ehrenfeucht, H. Maurer), 1980.
111. On a Bound for the DOL Sequence Equivalence Problem, Theoretical Computer Science **12**, 339–342 (with A. Ehrenfeucht), 1980.
110. Every Two Equivalent DOL Systems Have a Regular Envelope, Theoretical Computer Science **10**, 45–52 (with A. Ehrenfeucht), 1980.
109. DOS Systems and Languages: A Missing Block in the Systematic Theory of Contextfree Languages, Lecture Notes in Computer Science **85**, 134–141, Springer-Verlag (with A. Ehrenfeucht), 1980.
108. On Ambiguity in EOL Systems, Theoretical Computer Science **12**, 127–134 (with A. Ehrenfeucht), 1980.
107. On the Emptiness of the Intersection of Two DOS Languages Problem, Information Processing Letters **10**, 223–225 (with A. Ehrenfeucht), 1980.

106. On Basic Propertis of DOS Systems and Languages, *Information and Control* **47**, 138–153 (with A. Ehrenfeucht), 1980.
105. The Sequence Equivalence Problem Is Decidable for OS Systems, *Journal of the ACM* **27**, 656–663 (with A. Ehrenfeucht), 1980.
104. Synchronized and Desynchronized EOL Forms, *Discrete Applied Mathematics* **2**, 73–76 (with A. Ehrenfeucht, R. Verraedt), 1980.
103. Fixed Point Languages, Equality Languages and Representation of Recursively Enumerable Languages, *Journal of the ACM* **27**, 499–518 (with J. Engelfriet), 1980.
102. Tree Transducers, L Systems and Two-Way Machines, *Journal of Computer and System Sciences* **20**, 150–202 (with J. Engelfriet, G. Slutzki), 1980.
101. Restrictions, Extensions and Variations of NLC Grammars, *Information Sciences* **20**, 217–244 (with D. Janssens), 1980.
100. On the Structure of Node-Label Controlled Graph Languages, *Information Sciences* **20**, 191–216 (with D. Janssens), 1980.
99. A Study in Parallel Rewriting Systems, *Information and Control* **44**, 134–163 (with H.C.M. Kleijn), 1980.
98. On Metalinear ETOL Systems, *Fundamenta Informaticae* **3**, 15–36 (with D. Vermeir), 1980.
97. A Note on the M-growth Functions of FTOL Systems with Rank, *Fundamenta Informaticae* **3**, 295–302 (with D. Vermeir), 1980.
96. Synchronization and Related Phenomena in the Theory of EOL Systems and EOL Forms, *Bulletin de la Société Mathématique de Belgique* **32**, 189–208 (with R. Verraedt), 1980.
95. Synchronized and Desynchronized EOL Systems, *Information and Control* **46**, (with R. Verraedt), 1980.
94. Many-to-One Simulation in EOL Forms Is Decidable, *Applied Mathematics* **2**, 233–247 (with R. Verraedt), 1980.
93. Context-Free Grammars with Selective Rewriting, *Acta Informatica* **13**, 257–268 (with D. Wood), 1980.
92. On Arithmic Substitutions of EDTOL Languages, *Foundations of Control Engineering* **4**, (with A. Ehrenfeucht), 1979.
91. On the Structure of Polynomially Bounded DOL Systems, *Fundamenta Informaticae* **2**, 187–197 (with A. Ehrenfeucht), 1979.
90. An Observation on Scattered Grammars, *Information Processing Letters* **9**, 84–85 (with A. Ehrenfeucht), 1979.
89. Finding a Homomorphism between Two Words Is NP Complete, *Information Processing Letters* **9**, 86–88 (with A. Ehrenfeucht), 1979.
88. A Result on the Structure of ETOL Languages, *Foundations of Control Engineering* **4**, 165–171 (with A. Ehrenfeucht), 1979.
87. On ETOL Systems with Rank, *Journal of Computer and System Sciences* **19**, 237–255 (with A. Ehrenfeucht, D. Vermeir), 1979.

86. Equality Languages and Fixed Point Languages, *Information and Control* **43**, 20–49 (with J. Engelfriet), 1979.
85. Parallel Generation of Maps: Developmental Systems for Cell Layers, *Lecture Notes in Computer Science* **73**, 301–316, Springer-Verlag (with A. Lindenmayer), 1979.
84. Pure Interpretations of EOL Forms, *R.A.I.R.O. – Informatique Théorique et Applications* **13**, 347–362 (with H. Maurer, A. Salomaa, D. Wood), 1979.
83. Parallelism and Synchronization in Two-Level Meta-controlled Substitution Grammars, *Information and Control* **18**, 67–82 (with R. Meersman), 1979.
82. Persistent ETOL Systems, *Information Sciences* **18**, 189–212 (with R. Meersman, D. Vermeir), 1979.
81. Programs for Instruction Machines, *Information and Control* **41**, 9–28 (with Z. Pawlak, W. Savitch), 1979.
80. A Systematic Approach to Formal Language Theory through Parallel Rewriting, *Lecture Notes in Computer Science* **71**, 471–478, Springer-Verlag, 1979.
79. On Acceptors of Iteration Languages, *International Journal of Computer Mathematics* **7**, 3–19 (with D. Vermeir), 1979.
78. On Recursion in ETOL Systems, *Journal of Computer and System Sciences* **19**, 179–196 (with D. Vermeir), 1979.
77. Extending the Notion of Finite Index, *Lecture Notes in Computer Science* **71**, 479–488, Springer-Verlag (with D. Vermeir), 1979.
76. Simple EOL Forms under Uniform Interpretation Generating CF Languages, *Lecture Notes in Computer Science* **62**, 1–14, Springer-Verlag (with J. Albert, H. Maurer), 1978.
75. A Note on DOL Length Sets, *Discrete Mathematics* **22**, 233–242 (with A. Ehrenfeucht, J. Karhumäki), 1978.
74. EOL Languages Are Not Codings of FPOL Languages, *Theoretical Computer Science* **6**, 327–342 (with A. Ehrenfeucht), 1978.
73. Elementary Homomorphisms and a Solution of the DOL Equivalence Problem, *Theoretical Computer Science* **7**, 169–184 (with A. Ehrenfeucht), 1978.
72. On the Relationship between Context Free Programmed Grammars and ETOL Systems, *Fundamenta Informaticae* **1**, 325–345 (with A. Ehrenfeucht), 1978.
71. Simplifications of Homomorphisms, *Information and Control* **38**, 298–309 (with A. Ehrenfeucht), 1978.
70. Increasing the Similarity of EOL Form Interpretations, *Information and Control* **38**, 330–342 (with H. Maurer), 1978.
69. A Note on Generalized Context-Independent Rewriting, *Communication and Cognition* **11**, 181–196 (with R. Meersman), 1978.

68. On Cooperating Grammars, *Lecture Notes in Computer Science* **64**, 364–373, Springer-Verlag (with R. Meersman), 1978.
67. Two-Level Meta-controlled Substitution Grammars, *Acta Informatica* **10**, 323–339 (with R. Meersman), 1978.
66. Priorities on Context Conditions in Rewriting Systems, *Information Sciences* **14**, 15–50 (with V. Solms), 1978.
65. On the Effect of the Finite Index Restriction on Several Families of Grammars, *Information and Control* **39**, 284–301 (with D. Vermeir), 1978.
64. On the Effect of the Finite Index Restriction on Several Families of Grammars, Part II: Context-Dependent Systems, *Foundations of Control Engineering* **3**, 125–142 (with D. Vermeir), 1978.
63. On ETOL Systems of Finite Index, *Information and Control* **38**, 103–133 (with D. Vermeir), 1978.
62. On Some Context-Free Languages That Are Not Deterministic ETOL Languages, *R.A.I.R.O. – Informatique Théorique et Applications* **11**, 273–292 (with A. Ehrenfeucht), 1977.
61. TIL Systems and Languages, *Information Sciences* **12**, 203–277 (with K.P. Lee), 1977.
60. Two-Level Meta-controlled Substitution Grammars, *Lecture Notes in Computer Science* **53**, 390–397, Springer-Verlag (with R. Meersman), 1977.
59. Bibliography of L Systems, *Theoretical Computer Science* **5**, 339–354 (with M. Penttonen, A. Salomaa), 1977.
58. A Note on Universal Grammars, *Information and Control* **34**, 172–175, 1977.
57. Selective Substitution Grammars, Part I: Definitions and Examples, *Journal of Information Processing and Cybernetics EIK* **13**, 455–463, 1977.
56. New Squeezing Mechanism for L Systems, *Information Sciences* **2**, 187–203 (with A. Salomaa), 1977.
55. L-systems of Finite Index, *Lecture Notes in Computer Science* **52**, 430–439, Springer-Verlag (with D. Vermeir), 1977.
54. Acceptors for Iteration Languages, *Lecture Notes in Computer Science* **53**, 460–464, Springer-Verlag (with D. Vermeir), 1977.
53. On the Number of Subwords of Everywhere Growing and Uniform DTOL Languages, *Discrete Mathematics* **15**, 223–234 (with A. Ehrenfeucht, K.P. Lee), 1976.
52. On Proving That Certain Languages Are Not ETOL, *Acta Informatica* **6**, 407–415 (with A. Ehrenfeucht), 1976.
51. A Relationship between ETOL and EDTOL Languages, *Theoretical Computer Science* **1**, 325–330 (with A. Ehrenfeucht, S. Skyum), 1976.
50. On Slicing of K-iteration Grammars, *Information Processing Letters* **4**, 127–131, 1976.

49. More on ETOL Systems versus Random Context Grammars, *Information Processing Letters* **5**, 102–106, 1976.
48. Context-Free Grammars with Graph Controlled Tables, *Journal of Computer and System Sciences* **13**, 90–99, 1976.
47. Developmental Systems with Fragmentation, *International Journal of Computer Mathematics* **5**, 177–191 (with K. Ruohonen, A. Salomaa), 1976.
46. A Note on Family of Acceptors for Some Families of Developmental Languages, *International Journal of Computer Mathematics* **5**, 261–266 (with D. Wood), 1976.
45. A Note on K-iteration Grammars, *Information Processing Letters* **4**, 162–168 (with D. Wood), 1976.
44. Subword Complexities of Various Classes of Deterministic Developmental Languages with Interactions, *International Journal of Computer Mathematics* **4**, 219–236 (with A. Ehrenfeucht, K.P. Lee), 1975.
43. Subword Complexities of Various Deterministic Developmental Languages without Interactions, *Theoretical Computer Science* **1**, 59–76 (with A. Ehrenfeucht, K.P. Lee), 1975.
42. A Pumping Theorem for Deterministic EOL Languages, *R.A.I.R.O. – Informatique Théorique et Applications* **9**, 13–23 (with A. Ehrenfeucht), 1975.
41. Description of Developmental Languages, Using Recurrence Systems, *Mathematical Systems Theory* **8**, 316–341 (with G.T. Herman, A. Lindenmayer), 1975.
40. Some Properties of the Class of L-languages with Interactions, *Journal of Computer and System Sciences* **11**, 129–147 (with K.P. Lee), 1975.
39. TOL Schemes and Control Sets, *Information and Control* **27**, 109–125, 1975.
38. L Systems, Sequences and Languages, *Lecture Notes in Computer Science* **34**, 71–84, Springer-Verlag, 1975.
37. The Equality of EOL Languages and Codings of OL Languages, *International Journal of Computer Mathematics* **4**, 85–104 (with A. Ehrenfeucht), 1974.
36. Three Useful Results Concerning L Languages without Interaction, *LNCS* **15**, 72–77, Springer-Verlag (with A. Ehrenfeucht), 1974.
35. DOL Systems with Rank, *Lecture Notes in Computer Science* **15**, 136–141, Springer-Verlag (with A. Ehrenfeucht), 1974.
34. Generatively Deterministic L Languages, Subword Point of View, *LNCS* **15**, 93–103, Springer-Verlag (with A. Ehrenfeucht), 1974.
33. Nonterminals versus Homomorphisms in Defining Languages from Some Classes of Rewriting Systems, *Acta Informatica* **4**, 87–106 (with A. Ehrenfeucht), 1974.

32. The Number of Occurrences of Letters versus Their Distribution in Some EOL Languages, *Information and Control* **26**, 256–271 (with A. Ehrenfeucht), 1974.
31. The Length of DOL Languages Are Uniformly Bounded, *Information Processing Letters* **2**, 185–188 (with K.P. Lee), 1974.
30. Bibliography on L Systems, *Lecture Notes in Computer Science* **15**, 327–338, Springer-Verlag (with K.P. Lee), 1974.
29. Developmental Systems with Finite Axiom Sets, Part I: Systems without Interactions, *International Journal of Computer Mathematics* **4**, 43–68 (with K.P. Lee), 1974.
28. Developmental Systems with Finite Axiom Sets, Part II: Systems with Interaction, *International Journal of Computer Mathematics* **4**, 281–304 (with K.P. Lee), 1974.
27. Nonterminals, Homomorphisms and Codings in Different Variations of OL Systems, Part II: Nondeterministic Systems, *Acta Informatica* **3**, 357–364 (with M. Nielsen, A. Salomaa, S. Skyum), 1974.
26. Theory of L Systems from the Point of View of Formal Language Theory, *Lecture Notes in Computer Science* **14**, 1–23, Springer-Verlag, 1974.
25. Trade-Off between the Use of Nonterminals, Codings and Homomorphisms in Defining Languages for Some Classes of Rewriting Systems, *Lecture Notes in Computer Science* **14**, 473–580, Springer-Verlag, 1974.
24. Circularities in DOL Sequences, *Revue Roumaine de Mathématiques Pures et Appliquées* **9**, 1131–1152, 1974.
23. DOL Sequences, *Discrete Mathematics* **7**, 323–347, 1974.
22. Generative Models for Parallel Processes, *Computer Journal* **17**, 344–348 (with D. Wood), 1974.
21. A Limit Theorem for Sets of Subwords in Deterministic TOL Languages, *Information Processing Letters* **2**, 70–73 (with A. Ehrenfeucht), 1973.
20. TOL Systems and Control Sets, *Information and Control* **23**, 357–381 (with S. Ginsburg), 1973.
19. Developmental Systems with Locally Catenative Formulas, *Acta Informatica* **2**, 214–248 (with A. Lindenmayer), 1973.
18. TOL Systems and Languages, *Information and Control* **23**, 357–381, 1973.
17. Extension of Tabled OL Systems and Languages, *International Journal of Computer and Information Sciences* **2**, 311–333, 1973.
16. Characterization of Unary Developmental Languages, *Discrete Mathematics* **6**, 235–247 (with G.T. Herman, K.P. Lee, J. van Leeuwen), 1972.
15. Direction Controlled Context-Free Programmed Grammars, *Acta Informatica* **2**, 214–248, 1972.
14. Direction Controlled Programmed Grammars, *Acta Informatica* **1**, 242–252, 1972.

13. Direct Proof of the Undecidability of the Equivalence Problem for Sentential Forms of Linear Context-Free Languages, *Information Processing Letters* **1**, 233–235, 1972.
12. Constant-Program Address Machines Are Universal, *Revue Roumaine de Mathématiques Pures et Appliquées* **17**, 417–424, 1972.
11. The Equivalence Problem for Deterministic TOL Systems Is Undecidable, *Information Processing Letters* **1**, 201–204, 1972.
10. On OL Languages, *Information and Control* **13**, 302–318 (with P. Doucet), 1971.
9. The Unsolvability of the Isomorphism Problem for Address Machines, *Revue Roumaine de Mathématiques Pures et Appliquées* **16**, 1553–1558, 1971.
8. P-automata and P-events, *Bulletin de l'Académie Polonaise des Sciences* **17**, 565–570, 1969.
7. Finite Memory Address Machines Are Universal, *Bulletin de l'Académie Polonaise des Sciences* **17**, 401–403, 1969.
6. On the Introduction of Orderings into the Grammars of Chomsky's Hierarchy, *Bulletin de l'Académie Polonaise des Sciences* **17**, 559–563, 1969.
5. Some Remarks on Rabin and Scott's Notion of Multi-tape Automaton, *Bulletin de l'Académie Polonaise des Sciences* **16**, 215–218, 1968.
4. Languages of Derivations, *Bulletin de l'Académie Polonaise des Sciences* **15**, 753–758, 1967.
3. Decision Problems for Quasi-Uniform Events, *Bulletin de l'Académie Polonaise des Sciences* **15**, 745–752, 1967.
2. About Some Properties of Quasi-Uniform Chain Automata with $r > 0$, *Bulletin de l'Académie Polonaise des Sciences* **15**, 543–546, 1967.
1. Axioms for the Category of Relations with Composition, *Bulletin de l'Académie Polonaise des Sciences* **15**, 5–9, 1967.