CPM's 20th Anniversary: A Statistical Retrospective

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1 Introduction

This year the Annual Symposium on Combinatorial Pattern Matching (CPM) celebrates its 20th anniversary. Over the last two decades the Symposium has established itself as the most recognized international forum for research in combinatorial pattern matching and related applications. Contributions to the conference typically address issues of searching and matching strings and more complex patterns such as trees, regular expressions, graphs, point sets, and arrays. Advances in this field rely on the ability to expose combinatorial properties of the computational problem at hand and to exploit these properties in order to either achieve superior performance or identify conditions under which searches cannot be performed efficiently. The meeting also deals with combinatorial problems in computational biology, data compression, data mining, coding, information retrieval, natural language processing and pattern recognition.

The first edition of CPM was held in Paris in July 1990, and gathered about thirty participants. Since then the conference has been held every year, usually in June or July. Thirteen countries, over three continents, have hosted it (see Table 1). The "seed" of CPM can be traced back to a NATO-ASI Workshop in Maratea, Italy organized by Z. Galil and A. Apostolico. The volume collecting the contributions presented at the workshop [1] defined perhaps for the first time the scope of this research area, sometimes referred to as "stringology". The intent of the first two editions of CPM was to reconnect with the participants and to the spirit of the NATO-ASI meeting in Maratea. CPM'90 and CPM'91 were organized like schools with neither submission/refereeing process nor proceedings. For CPM'92, however, NSF funding was contingent upon having a Program Committee and printed proceedings, so the Symposium was born.

Selected papers from the 1990 meeting were published in a special issue of *Theoretical Computer Science* [2]. Since 1992, submitted papers have been peer-reviewed and accepted contributions have been published in Lecture Notes in Computer Science (Springer-Verlag). CPM proceedings have been published in the LNCS series, volumes 644 [8], 684 [9], 807 [10], 937 [11], 1075 [12], 1264 [13], 1448 [14], 1645 [15], 1848 [16], 2089 [17], 2373 [18], 2676 [19], 3109 [20], 3537 [21], 4009 [22], 4580 [23], and 5029 [24].

The practice of inviting a selected subset of the accepted papers for journal publication was resumed with the 11th meeting which appeared in volume 2 of *Journal of Discrete Algorithms* [5]. Then again, papers from the 12th meeting in volume 146 of *Discrete Applied Mathematics* [3], from the 14th meeting in volume 3 of *Journal of*

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Table 1. Locations, dates, program chairs, and number of PC members for all CPM editions

Date	Location	Chair(s)	|PC|
1990, July 9-13	Paris, France	M. Crochemore	N/A
1991, April 17-19	London, UK	C.S. Iliopoulos	N/A
1992, April 29 - May 1	Tucson, AZ, USA	U. Manber	10
1993, June 2-4	Padova, Italy	A. Apostolico	10
1994, June 5-8	Asilomar, CA, USA	M. Crochemore, D. Gusfield	10
1995, July 5-7	Helsinki, Finland	Z. Galil, E. Ukkonen	10
1996, June 10-12	Laguna Beach, CA, USA	D. Hirschberg, Z. Galil	12
1997, June 30 - July 2	Aarhus, Denmark	A. Apostolico, J. Hein	12
1998, July 20-21	Piscataway, NJ, USA	M. Farach, U. Manber	15
1999, July 22-24	Warwick, UK	M. Crochemore, M. Paterson	15
2000, June 21-23	Montréal, Canada	R. Giancarlo, D. Sankoff	14
2001, July 1-4	Jerusalem, Israel	A. Amir, G. Landau	20
2002, July 3-5	Fukuoka, Japan	A. Apostolico, M. Takeda	17
2003, June 25-27	Morelia, Michocán, Mexico	R. Baeza-Yates, E. Chavez, M. Crochemore	19
2004, July 5-7	Istanbul, Turkey	U. Dogrusoz, S. Muthukrishnan, S. C. Sahinalp	16
2005, June 19-22	Jeju Island, Korea	A. Apostolico, M. Crochemore, Kunsoo Park	20
2006, July 5-7	Barcelona, Spain	M. Lewenstein, G. Valiente	19
2007, July 9-10	London, Ontario, Canada	K. Zhang, B. Ma	26
2008, June 18-20	Pisa, Italy	G. M. Landau, P. Ferragina	27
2009, June 22-24	Lille, France	G. Kucherov, E. Ukkonen	31

Discrete Algorithms [4], from the 15th meeting in volume 368 of *Theoretical Computer Science* [7] and from the 16th meeting in volume 5 of *Journal of Discrete Algorithms* [6]. Selected papers from CPM'08 are expected to appear this year in *Theoretical Computer Science*.

A total of 127 individuals has served in the 18 program committees (including 2009). The size of the PC has increased from ten in the first few years to a record thirty-one for 2009. For the twentieth anniversary of CPM all previous PC chairs were invited to serve as PC members.

2 Submitted Papers and Acceptance Rates

A total of 460 peer-reviewed papers have been published in the conference proceedings up to 2008 (including the TCS special issue for CPM'90). While the number of accepted papers has been relatively stable over the years, the number of submitted papers to the Symposium varied greatly (see Table 2). The maximum number of submission (129) was recorded for CPM'05 held in Korea, and the minimum (26) was reached in 1999. From 1992 to 2009, a total 988 papers have been submitted to CPM.

Table 2. Number of accepted and submitted papers, acceptance ratio, number of authors, number of new authors, and average number of authors per paper

	Accepted	Submitted	Ratio %	Authors	New	Avg authors/paper
1992	22	39	56.4	43	38	2.04
1993	19	34	55.9	33	16	1.89
1994	26	41	63.4	52	38	2.15
1995	29	44	65.9	52	35	2.03
1996	28	48	58.3	61	34	2.28
1997	20	32	62.5	51	33	2.6
1998	17	49	34.7	42	22	2.52
1999	21	26	80.8	44	27	2.43
2000	29	44	65.9	64	38	2.03
2001	22	35	62.9	46	23	2.5
2002	23	37	62.2	58	33	2.78
2003	28	57	49.1	63	36	2.36
2004	36	79	45.6	95	62	2.94
2005	37	129	28.7	98	63	2.73
2006	33	88	37.5	82	38	2.67
2007	32	64	50	84	36	2.91
2008	25	78	32.1	67	27	2.84
2009	27	63	42.9	84	35	3.11

While the average acceptance rate is about 56%, the spread of the distribution is quite wide. The lowest acceptance rate (29%) was recorded in 2005, the highest (81%) was reached in 1999. Table 2 shows the number of submitted papers and the acceptance rates over the years.

3 Conference Proceedings: An Analysis of Authorship

A total of 597 distinct authors have published peer-reviewed papers in the conference proceedings (including the TCS special issue for CPM'90). Out of these, 393 authors have published only once in the proceedings. There are 97 authors that published twice, 40 authors with three papers, and 25 authors with four. Authors that published more than five papers in CPM are listed in Table 3. While every effort was made to normalize the names of the author throughout the years, inaccuracies might be still present which might bias the statistics.

Table 2 reports the average number of authors for each CPM edition with proceedings published in LNCS. Note that the average is clearly increasing – it was about two authors/paper in the early nineties, and it is currently approaching an average of three authors. The increase in the number of authors is a general trend in the Sciences and has been observed in several disciplines.

We have also carried out an analysis of new authors in each CPM edition. We counted an author to be "new" if he or she had never published in CPM before. Table 2 shows that each year a large fraction of the authors publishing papers in CPM are first-timers.

Table 3. Authors with more than five papers in the CPM proceedings

Author	CPM papers	Author	CPM papers
Gonzalo Navarro	25	Tao Jiang	7
Kaizhong Zhang	15	Dong Kyue Kim	6
Amihood Amir	12	Ely Porat	6
Gad Landau	12	Jens Stoye	6
Kunsoo Park	12	John Kececioglu	6
Leszek Gąsieniec	10	Jorma Tarhio	6
Masayuki Takeda	10	Juha Kärkkäinen	6
Wojciech Rytter	10	Mathieu Raffinot	6
Bin Ma	9	Ming Li	6
Costas Iliopoulos	9	William Smyth	6
Veli Makinen	9	Wojciech Szpankowski	6
Maxime Crochemore	9	Eugene Myers	6
Ayumi Shinohara	8	Dekel Tsur	5
Michal Ziv-Ukelson	8	Mireille Régnier	5
Setsuo Arikawa	8	Rolf Backofen	5
Lusheng Wang	8	S. Muthukrishnan	5
Esko Ukkonen	7	Stéphane Vialette	5
David Sankoff	7	Tak-Wah Lam	5
Moshe Lewenstein	7	Tatsuya Akutsu	5
Pavel Pevzner	7	Wojciech Plandowski	5
Ricardo Baeza-Yates	7	Dan Gusfield	5

To evaluate the dependency between geographic location and contributions to CPM, we looked at the country of affiliation of authors over the years. More specifically, we counted how many papers have at least one author for a given country of affiliation. The resulting graph is shown in Figure 1. It is interesting to note that some countries have kept a somewhat steady stream of papers, e.g., Canada, France, UK, Chile. In contrast, contributions from the US are showing a clear decline from the early nineties. The number of papers from Israel have been showing a significant increase since 2002.

In order to further analyze the relationships between authors, we built the collaboration network $G = (V, E)$ where nodes in V correspond to authors, and $(u, v) \in E$ if u and v co-authored a paper in CPM. The graph has a total of 597 nodes and 946 edges, which results in an average degree of 3.18 edges. The resulting network has 114 connected components, of which 40 are single nodes, 39 are components of size 2, 17 of size 3, 10 of size 4 and one/two of size 5,6,7,9 and 11.

The largest connected component of the collaboration network is composed of 348 nodes (see Figure 2). In the figure, nodes and label sizes have been drawn proportional to the node degree. There are four nodes with the degree 20 or more: Costas Iliopoulos with 23 links, Amihood Amir with 21, Gonzalo Navarro with 21 and Gad Landau with 20. A high resolution picture of the graph can be downloaded from `http://www.cs.ucr.edu/~stelo/cpm/`. We computed the graph *diameter* which is the longest shortest path in the graph, the *average clustering coefficient* which measures the extent to which vertices linked to any given vertex are also linked to each other, and the *characteristic path length* which is the average shortest path distance between pairs of

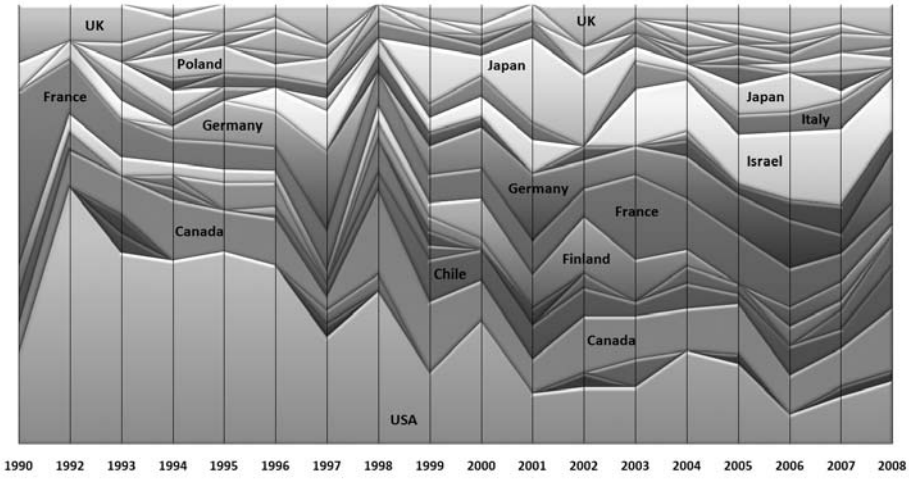

Fig. 1. Fraction of CPM papers which have at least one authors for a given country of affiliation

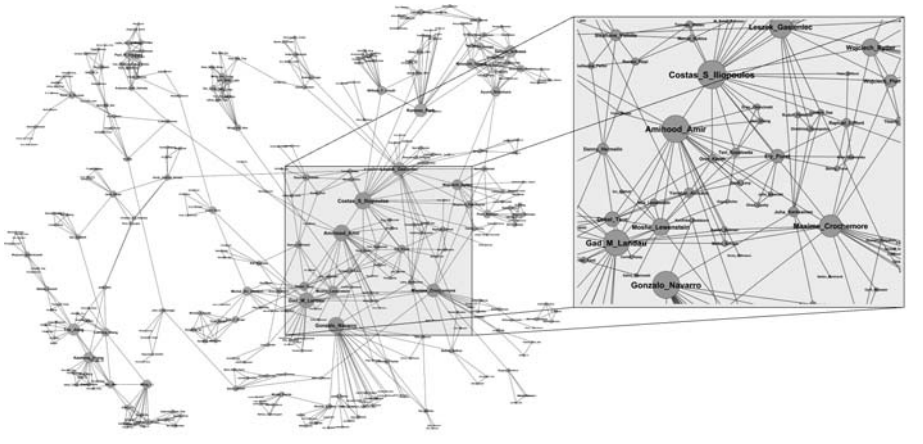

Fig. 2. The largest connected component of the CPM collaboration network. The size of each node/label is proportional to its degree. A high resolution picture of this network can be downloaded from `http://www.cs.ucr.edu/~stelo/cpm/`

vertices. The diameter of the largest connected component of the collaboration network is 17 edges, the average clustering coefficient is 0.8, and the characteristic path length is 6.49.

We have also computed *central* nodes for the largest connected component. Central nodes are the ones which have the smallest average shortest path length to all the other nodes. The top five central nodes are Maxime Crochemore (average shortest path length 3.95389), Wojciech Rytter (4.04323), Costas Iliopoulos (4.12392), Wojciech Plandowski (4.12392) and Leszek Gąsieniec (4.22767).

Fig. 3. Frequency analysis of CPM paper titles using Wordle (`http://www.wordle.net/`)

4 Conference Proceedings: An Analysis of Titles

We carried out a simple analysis of the most frequent words contained in the titles over the years. We considered only one occurrence of each term per title, and merged counts for singular and plural. Not surprisingly, “matching”, ”algorithm” and “string” are the most frequent terms, with 118, 92 and 81 occurrences, respectively. The word “pattern” appears less frequently (56 times), but not as rarely as “combinatorial” which occurs only three times! Figure 3 illustrates the frequency analysis using Wordle (`http://www.wordle.net/`).

Other words that appear more than twenty times in titles are: tree (53), approximate (48), problem (44), sequence (36), alignment (36), suffix (35), common (29), efficient (27), distance (27), fast (26), time (24), compressed (23), text (22), linear (22), two (21), multiple (21), and dimensional (20).

When searching for patterns composed by two words, the pairs “string-matching” (50), “pattern-matching” (41) and “approximate-matching” (37) are the most frequent. Other pairs that occur at least ten times are: algorithm-matching (28), approximate-string (26), algorithm-string (22), suffix-tree (17), array-suffix (16), algorithm-tree (16), common-subsequence (15), fast-matching (14), dimensional-matching (14), dimensional-two (13), compressed-text (13), common-longest (13), matching-two (12), linear-time (12), dimensional-pattern (12), alignment-multiple (12), algorithm-problem (12), algorithm-pattern (12), algorithm-fast (12), algorithm-approximation (12), longest-subsequence (11), alignment-sequence (11), algorithm-efficient (11), expression-regular (10), compressed-matching (10), and algorithm-alignment (10).

We also looked at patterns composed by three words. Six patterns occurs at least ten times, namely “approximate-matching-string” (24), “algorithm-matching-string” (12), “dimensional-matching-two” (11), “dimensional-matching-pattern” (11), “common-longest-subsequence” (11) and “algorithm-matching-pattern” (10). The most frequent pattern composed of four terms is “dimensional-matching-pattern-two” (8). The two most frequent patterns composed of five terms are “dimensional-matching-pattern-rotation-two” (4) and “compressed-Lempel-matching-text-Ziv” (4).

5 Conference Proceedings: An Analysis of Citations

Several papers that appeared in proceedings of CPM had a significant impact on the field of computer science, and some are consider to be seminal works. We carried out an analysis of the citation count for each of the 460 published articles using Google Scholar. We should point out that Google Scholar provides merely an approximation for the exact number of citations, and by no means our analysis or ranking should be taken literally.

Table 4. Most cited CPM papers according to Google Scholar, as of Feb 2009. The counts are the sum of the citations to the conference version and the corresponding journal version, if there is one with the exact same title. * refers to the journal version appeared in JCB 2001, with an additional author (D. Sokol).

Author(s)	Title	Citations	CPM Year
Esko Ukkonen	Approximate string-matching with q-grams and maximal matches	235	1990
Eugene Myers	A Fast Bit-Vector Algorithm for Approximate String Matching Based on Dynamic Programming	172	1998
Pang Ko, Srinivas Aluru	Space Efficient Linear Time Construction of Suffix Arrays	148	2003
Tao Jiang, Lusheng Wang, Kaizhong Zhang	Alignment of Trees - An Alternative to Tree Edit	138	1994
Gad M. Landau, Jeanette P. Schmidt	An Algorithm for Approximate Tandem Repeats	137*	1993
Toru Kasai, Gunho Lee, Hiroki Arimura, Setsuo Arikawa, Kunsoo Park	Linear-Time Longest-Common-Prefix Computation in Suffix Arrays and Its Applications	135	2001
Esko Ukkonen	Approximate String-Matching over Suffix Trees	125	1993
Dong Kyue Kim, Jeong Seop Sim, Heejin Park, Kunsoo Park	Linear-Time Construction of Suffix Arrays	114	2003
Ricardo A. Baeza-Yates, Walter Cunto, Udi Manber, Sun Wu	Proximity Matching Using Fixed-Queries Trees	113	1994
Anne Bergeron	A Very Elementary Presentation of the Hannenhalli-Pevzner Theory	111	2001
John Kececioglu, David Sankoff	Exact and Approximation Algorithms for the Inversion Distance Between Two Chromosomes	108	1993
Udi Manber	A Text Compression Scheme That Allows Fast Searching Directly in the Compressed File	99	1994
Lucas Chi Kwong Hui	Color Set Size Problem with Application to String Matching	93	1992
Sridhar Hannenhalli	Polynomial-time Algorithm for Computing Translocation Distance between Genomes	93	1995
John Kececioglu, David Sankoff	Efficient Bounds for Oriented Chromosome Inversion Distance	92	1994
Vineet Bafna, Eugene L. Lawler, Pavel A. Pevzner	Approximation Algorithms for Multiple Sequence Alignment	90	1994
Dominique Revuz	Minimisation of acyclic deterministic automata in linear time	87	1990
Jotun Hein, Tao Jiang, Lusheng Wang, Kaizhong Zhang	On the Complexity of Comparing Evolutionary Trees	86	1995
Dan Gusfield	Haplotype Inference by Pure Parsimony	83	2003
John Kececioglu	The Maximum Weight Trace Problem in Multiple Sequence Alignment	82	1993
Stefan Burkhardt, Juha Kärkkäinen	Better Filtering with Gapped q-Grams	79	2001
William I. Chang, Jordan Lampe	Theoretical and Empirical Comparisons of Approximate String Matching Algorithms	78	1992
Ricardo A. Baeza-Yates, Chris H. Perleberg	Fast and Practical Approximate String Matching	77	1992
Vineet Bafna, S. Muthukrishnan, R. Ravi	Computing Similarity between RNA Strings	75	1995
William I. Chang, Thomas G. Marr	Approximate String Matching and Local Similarity	74	1994
Archie L. Cobbs	Fast Approximate Matching using Suffix Trees	69	1995
Gonzalo Navarro, Mathieu Raffinot	A General Practical Approach to Pattern Matching over Ziv-Lempel Compressed Text	69	1999
Jens Stoye, Dan Gusfield	Simple and Flexible Detection of Contiguous Repeats Using a Suffix Tree	69	1998
Juha Kärkkäinen	Suffix Cactus: A Cross between Suffix Tree and Suffix Array	67	1995
Steffen Heber, Jens Stoye	Finding All Common Intervals of k Permutations	66	2001
Erkki Sutinen, Jorma Tarhio	Filtration with q-Samples in Approximate String Matching	65	1996
Tzvika Hartman	A Simpler 1.5-Approximation Algorithm for Sorting by Transpositions	65	2003
Gonzalo Navarro, Erkki Sutinen, Jani Tanninen, Jorma Tarhio	Indexing Text with Approximate q-Grams	62	2000
Vincent A. Fischetti, Gad M. Landau, Jeanette P. Schmidt, Peter H. Sellers	Identifying Periodic Occurrences of a Template with Applications to Protein Structures	62	1992
Chia-Hsiang Chang, Robert Paige	From Regular Expressions to DFA's Using Compressed NFA's	61	1992
Gautam Das, Rudolf Fleischer, Leszek Gąsieniec, Dimitrios Gunopulos, Juha Kärkkäinen	Episode Matching	60	1997

Table 4 shows papers cited at least sixty times as of February 2009, according to Google Scholar. We note that Google Scholar merges citations of both conference and journal version of the same paper when both manuscripts share the same title. The number of citations in the table reflects both conference version and the corresponding journal version (if there is one). However, if the journal version was published with a different title the citation counts are not added, which introduces a bias. The table also includes the number of citations for the journal version of a paper by G. Landau and J. Schmidt initially appeared in CPM'93, and later published with the same title but with an additional author (D. Sokol) in *J. Computational Biology*.

The list in Table 4 includes 36 contributions ranging from CPM'90 to CPM'03. The top ten most cited articles include two very recent papers on the construction of suffix arrays in linear time. A cursory inspection of the titles in the table reveals a number of contributions related to approximate string matching, selected problems in computational biology (genome rearrangement, haplotyping, multiple sequence alignment, and repeat analysis), and tree matching/alignment, among others.

6 CPM Invited Speakers

Each year, two to five distinguished scientists are invited to deliver lectures at the conference in a variety of fields. The list of speakers includes Alfred V. Aho (1990), Esko Ukkonen (1990 and 2005), Alberto Apostolico (1990 and 1991), Maxime Crochemore (1990 and 1991), Zvi Galil (1990, 1991 and 2001), Uzi Vishkin (1995 and 2001), H. W. Mewes (1995), David Lipman (1996), Richard Arratia (1996), A. Dress (1997), J. B. Kruskal (1997), Ken Church (1998), Mick Noordewier (1998), Joan Feigenbaum (1999), David Jones (1999), Andrei Broder (2000), Fernando Pereira (2000), Ian H. Witte (2000), Aviezri Fraenkel (2001), Rao Kosaraju (2001), Shinichi Morishita (2002), Hiroki Arimura (2002), Vladimir Levenshtein (2003), J. Ian Munro (2003 and 2008), Evan Eichler (2004), Martin Farach-Colton (2004), Paolo Ferragina (2004), Piotr Indyk (2004), Eugene Myers (2004), Ming Li (2005), Naftali Tishby (2005), Amihood Amir (2006), Eran Halperin (2006), Steven Skiena (2006), Tao Jiang (2007), S. Muthukrishnan (2007), Frances Yao (2007), Daniel M. Gusfield (2008), Prabhakar Raghavan (2008), Christos Faloutsos (2009), Roberto Grossi (2009), Ravi Kumar (2009).

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Fig. 4. Group photo of CPM'92 participants. **Standing back (right to left):** G. Benson, R. Baeza-Yates, A. Hume, J. Knight, C. Burks, H. Berghel, A. Ehrenfeucht, D. Roach, U. Manber, M. Waterman, R. Idury, A. Amir, G. Lawler, E. Port, W. Chang, M. Vingron, P. Pevzner, E. Ukkonen, F. Olken, X. Xu, A. Apostolico, T. Lecroq, and G. Havas. **Standing first row**: B. Pittel, M. Jain, D. Revuz, E. Myers, A. Schaffer, S. Seiden, D. Mehta, T. Choudhary, T. Cheung Ip, L. J. Cummings, R. Irving, S. Kannan, J. Kececioglu, P. Kilpelainen, K. Zhang, S. Wu, L. Hui, T. Warnow, and Y. D. Lyuu. **Sitting second row:** R. Paige, L. Rostami, J.Yong Kim, M. Farach, H. Wolfson, G. Landau, J. Schmidt, G. Herrmannsfeldt, D. Sankoff, R. Hariharan, L. Toniolo, C. Soderlund, D. Gusfield, and W. Szpankowski. **Sitting first row:** M. Crochemore, D. Joseph, X. Huang, M. Régnier, D. Hirschberg, M. McClure, G. Lewandowski, T. Vasi, B. Baker, C. Fraser, and P. Jacquet. **On the floor:** J. Oommen, G. Jacobson, and K. Phong Vo.

Fig. 5. Group photo of CPM'93 participants. **Standing (left to right):** A. Apostolico, T. Akutsu, G. Landau, D. Breslauer, K. Zhang, O. Delgrange, J. Tarhio, ?, ?, M. Waterman, E. Norel, ?, ?, L. Toniolo, S. Muthukrishnan? , M. Crochemore, G. Gonnet, J. Kececioglu, H. Wolfson, ?, M. Régnier, M. Frigo, W. Plandowski?, C. Iliopoulos, A. Lesk, L. Rostami, R. Baeza-Yates, W. Szpankowski, P. Pevzner, E. Ukkonen , L. Gąsienec, ?. **Sitting (left to right):** ?, L. Colussi, D. Naor, J. Schmidt, R. Giancarlo, ?, G. Bilardi, U. Manber, ?, ?, R. Irving, F. Tahi, E. Myers, S. Abdeddaïm

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8 Concluding Remarks

The twentieth edition of CPM in Lille provides an opportunity to reflect on CPM's history and the impact of its research contributions to Computer Science. Most of scientists that shaped the discipline of Combinatorial Pattern Matching are still very active in this research area (see Figures 4 and 5 for a group photo of CPM'92 and CPM'93 participants). At the same time, the community around CPM has grown enough to make it a self-sustaining event, both financially and scientifically. We are certainly looking forward to the next twenty years!

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References

1. Apostolico, A., Galil, Z. (eds.): Combinatorial Algorithms on Words. NATO ASI Series, Advanced Science Institutes Series, Series F, vol. 12. Springer, Heidelberg (1985)
2. Crochemore, M. (ed.): Proceedings of the 1st Annual Symposium on Combinatorial Pattern Matching. Theoret. Comput. Sci., 92(1) (1992)
3. Amir, A., Landau, G.M. (eds.): 12th Annual Symposium on Combinatorial Pattern Matching. Special issue of Discrete Applied Mathematics, vol. 146(2). Elsevier, Amsterdam (2005)
4. Baeza-Yates, R., Crochemore, M. (eds.): Indexing and Matching Strings. Special issue of J. Discrete Algorithms 3(2–4) (2005)
5. Crochemore, M., Gąsieniec, L. (eds.): Matching Patterns. Hermès (2000); Special issue of J. Discrete Algorithms
6. Park, K., Mouchard, L. (eds.): Selected papers from Combinatorial Pattern Matching, 2005. Special issue of J. Discrete Algorithms 5(4) (2005)
7. Sahinalp, S.C., Dogrusoz, U., Muthukrishnan, S. (eds.): Combinatorial Pattern Matching. Special issue of Theoretical Computer Science 368(3) (2006)
8. Apostolico, A., Galil, Z., Manber, U., Crochemore, M. (eds.): CPM 1992. LNCS, vol. 644. Springer, Heidelberg (1992)
9. Apostolico, A., Crochemore, M., Galil, Z., Manber, U. (eds.): CPM 1993. LNCS, vol. 684. Springer, Heidelberg (1993)
10. Crochemore, M., Gusfield, D. (eds.): CPM 1994. LNCS, vol. 807. Springer, Heidelberg (1994)

11. Galil, Z., Ukkonen, E. (eds.): CPM 1995. LNCS, vol. 937. Springer, Heidelberg (1995)
12. Hirschberg, D.S., Myers, E.W.: CPM 1996. LNCS, vol. 1075. Springer, Heidelberg (1996)
13. Apostolico, A., Hein, J.: CPM 1997. LNCS, vol. 1264. Springer, Heidelberg (1997)
14. Farach-Colton, M. (ed.): CPM 1998. LNCS, vol. 1448. Springer, Heidelberg (1998)
15. Crochemore, M., Paterson, M. (eds.): CPM 1999. LNCS, vol. 1645. Springer, Heidelberg (1999)
16. Giancarlo, R., Sankoff, D. (eds.): CPM 2000. LNCS, vol. 1848. Springer, Heidelberg (2000)
17. Amir, A., Landau, G.M. (eds.): CPM 2001. LNCS, vol. 2089. Springer, Heidelberg (2001)
18. Apostolico, A., Takeda, M. (eds.): CPM 2002. LNCS, vol. 2373. Springer, Heidelberg (2002)
19. Baeza-Yates, R. A., Chávez, E., Crochemore, M. (eds.): CPM 2003. LNCS, vol. 2676. Springer, Heidelberg (2003)
20. Sahinalp, S.C., Muthukrishnan, S., Dogrusoz, U. (eds.): CPM 2004. LNCS, vol. 3109. Springer, Heidelberg (2004)
21. Apostolico, A., Crochemore, M., Park, K. (eds.): CPM 2005. LNCS, vol. 3537. Springer, Heidelberg (2005)
22. Lewenstein, M., Valiente, G. (eds.): CPM 2006. LNCS, vol. 4009. Springer, Heidelberg (2006)
23. Ma, B., Zhang, K. (eds.): CPM 2007. LNCS, vol. 4580. Springer, Heidelberg (2007)
24. Ferragina, P., Landau, G.M. (eds.): CPM 2008. LNCS, vol. 5029. Springer, Heidelberg (2008)