

IN MEMORIAM
CHRISTOS LEVCPOULOS
***05.07.1956 - †10.06.2025**

Our dear colleague and friend Christos Levcopoulos passed away on June 10 2025 at the age 68, way too early. He was suffering from skin cancer that was rapidly spreading into other organs the last months of his life.

Christos was born in 1956 in Thessaloniki, Greece, and moved to Sweden in 1976. In 1981, he obtained the Bachelor degree in Administration and System Sciences with specialization in Computer Science, at Linköping University.

I first met Christos in 1984, when he became my first PhD student at the Department of Computer Science of Linköping University. Soon we became not only colleagues but also friends for the rest of our lives. During that time, I was researching on decompositions of geometric figures and that topic proved to be perfect for Christos. It soon became clear that he had great talent for algorithmic thinking, especially in computational geometry. Soon he improved several of my results on geometric decompositions. In 1987, he defended his strong PhD thesis on heuristics for minimal divisions of polygons. Among other things, it included tight bounds on minimum number covering of polygons with rectangles [1] and close approximation algorithms for minimum length partitions of isothetic polygons into rectangles, based on a novel thickest-first approach (e.g., see [2]). Christos kept returning to the problems of optimal decompositions of geometric figures in several later papers. In 1989/90 we moved to Lund University together. Shortly after, Christos published several interesting papers on adaptive sorting with his first PhD student Ola Petersson (e.g., see [6, 7]). Then came Christos' pioneering geometric results on the first $O(1)$ -approximation of minimum-weight triangulation in polynomial time [9] and on geometric spanners showing that nearly optimal cheap geometric spanners can be constructed from the Delaunay triangulation in linear time [4] (the first result was established jointly with his PhD student Drago Krznaric). Both results are highly appreciated today. Christos successfully pursued his research on minimum weight triangulation (e.g., [10]) and geometric spanners, jointly with his PhD students (among other things with Joachim Gudmundsson [14]), and later also with Giri Narasimhan and Michiel Smid [13]. He also obtained interesting results on geometric clustering (e.g., see

[11]) and geometric minimum spanning trees (e.g., see [8]), mostly with his PhD students. In 1997 Christos became an associate professor. Soon he had enough strong publications to apply for a promotion to full professor but we could not convince him to do this. He had other values and an academic career was not so important to him. Between 2000 and 2007 Christos was head of our section for theoretical computer science and also head of the entire department of computer science during a substantial part of this period. In the 2000s, Christos extended his research topics by strong contributions among other things on distance oracles [15] and distributed computing [16].

Summarizing, Christos published +120 peer reviewed conference articles (including STOC, SODA, ICALP, ESA, SoCG) and journal articles (e.g., SIAM J. Computing, J. Algorithms, ACM Transactions on Algorithms, Discrete Computational Geometry, Information and Computation, JCSS, TCS, Algorithmica etc.). He was an editor of the Journal of Discrete Algorithms and served on program committees of several TCS conferences including SoCG and SWAT.

Christos was a talented excellent researcher, dedicated successful supervisor, solid teacher and leader. He was always very kind and balanced, ready to offer constructive help to anybody in his environment. We shall miss him very much.

Selected Christos Levcopoulos' publications

- [1] C. Levcopoulos, A. Lingas. Covering Polygons with Minimum Number of Rectangles. *STACS* 1984: 63-72
- [2] C. Levcopoulos. Fast Heuristics for Minimum Length Rectangular Partitions of Polygons. *SCG* 1986: 100-108
- [3] C. Levcopoulos. An $\Omega(\sqrt{n})$ Lower Bound for the Nonoptimality of the Greedy Triangulation. *Inf. Process. Lett.* 25(4): 247-251 (1987)
- [4] C. Levcopoulos, A. Lingas. There Are Planar Graphs Almost as Good as the Complete Graphs and Almost as Cheap as Minimum Spanning Trees. *Algorithmica* 8(3): 251-256 (1992) (Preliminary version *Optimal Algorithms* 1989: 9-13)
- [5] C. Levcopoulos, A. Lingas, J.-R. Sack. Heuristics for Optimum Binary Search Trees and Minimum Weight Triangulation Problems. *Theor. Comput. Sci.* 66(2): 181-203 (1989) (Preliminary version *ICALP* 1987: 376-385)
- [6] C. Levcopoulos, O. Petersson. Adaptive Heapsort. *J. Algorithms* 14(3): 395-413 (1993) 1992
- [7] C. Levcopoulos, O. Petersson. Sorting Shuffled Monotone Sequences. *Inf. Comput.* 112(1): 37-50 (1994)
- [8] D. Krznaric, C. Levcopoulos, B.J. Nilsson. Minimum Spanning Trees in d Dimensions. *ESA* 1997: 341-349

- [9] C. Levcopoulos, D. Krznaric. Quasi-Greedy Triangulations Approximating the Minimum Weight Triangulation. *J. Algorithms* 27(2): 303-338 (1998) (Preliminary version *SODA* 1996: 392-401)
- [10] C. Levcopoulos, D. Krznaric. A Linear-Time Approximation Scheme for Minimum, Weight Triangulation of Convex Polygons. *Algorithmica* 21(3): 285-311 (1998) (Preliminary version *SODA* 1997: 518-527)
- [11] D. Krznaric, C. Levcopoulos. Fast Algorithms for Complete Linkage Clustering. *Discret. Comput. Geom.* 19(1): 131-145 (1998) (Preliminary version *ISAAC* 1995: 392-401)
- [12] C. Levcopoulos, D. Krznaric. A Linear-Time Approximation Scheme for Minimum, Weight Triangulation of Convex Polygons. *Algorithmica* 21(3): 285-311 (1998) (Preliminary version *SODA* 1997: 518-527)
- [13] C. Levcopoulos, G. Narasimhan, M.H. M. Smid. Improved Algorithms for Constructing Fault-Tolerant Spanners. *Algorithmica* 32(1): 144-156 (2002) (Preliminary version *STOC* 1998: 186-195)
- [14] J. Gudmundsson, C. Levcopoulos, G. Narasimhan. Fast Greedy Algorithms for Constructing Sparse Geometric Spanners. *SIAM J. Comput.* 31(5): 1479-1500 (2002)
- [15] J. Gudmundsson, C. Levcopoulos, G. Narasimhan, M.H. M. Smid. Approximate distance oracles for geometric spanners. *ACM Trans. Algorithms* 4(1): 10:1-10:34 (2008) (Preliminary version *SODA* 2002: 828-837)
- [16] L. Gasieniec, J. Jansson, C. Levcopoulos, A. Lingas. Efficient assignment of identities in anonymous populations. *Inf. Comput.* 303: 105265 (2025)