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Biographical Sketch — October 2021

Dr. Franc Brglez

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Research Professor

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Education:

1970: Ph.D., Electrical Engineering, University of Colorado, Boulder, Colorado

1965: Dipl.-Ing., Electrical Engineering, University of Ljubljana, Slovenia

Appointments:

1994-present: Research Professor, Director of CBL (Collaborative Benchmarking Laboratory); Department of Computer Science, N.C. State University (Raleigh, NC)

1989-93: Director, Design Synthesis Research, MCNC; Adjunct Professor, NCSU/Duke U.

1986-89: Director, Design Synthesis Research, BNR; Adjunct Professor, NCSU/Duke U.

1971-85: Scientific Staff, BNR; Adjunct Professor, Carleton University, Ottawa, Ontario, Canada

(A) Scope of my research and awards since 1985:

I have worked for nearly 20-years in industry while also affiliated with a number of universities in Canada, North Carolina, Germany, Slovenia, Saudi Arabia, and Brazil. In 1986 I initiated, then continued as a General Chair until 1992, the International ACM Workshop Series on Layout and Logic Synthesis, held yearly at MCNC, Research Triangle Park, NC (with about 150 attendees from Americas, Europe, and Asia). This trend-setting series of workshops was a follow-up on the innovative organization of IEEE special sessions at ISCAS85 (Kyoto, Japan) and at ISCAS89 (Seattle, WA); both sessions were associated with distributions of challenging test generation benchmarks, now known under these acronyms. As of October 2021, there are $O(807,000)$ and $O(1,110,000)$ search engine hits for each of these two acronyms alone. A world-wide following from other special interest groups, including the NSF-sponsored DIMACS series of workshops, ensued in 1990's. For awards, see <https://people.engr.ncsu.edu/brglez/index.html>

(B) My current research:

As an antidote to the tongue-in-cheek article '*Metaheuristics—the metaphor exposed*' on the state-of-the-art stochastic algorithms <https://onlinelibrary.wiley.com/doi/abs/10.1111/itor.12001>

... a true tsunami of 'novel' metaheuristic methods, most of them based on a metaphor of some natural or man-made process. The behavior of virtually any species of insects, the flow of water, musicians playing together – it seems that no idea is too far-fetched to serve as inspiration to launch yet another metaheuristic.

my current research focuses on computational experiments that demonstrate that such metaphors from 'nature' have led to inconclusive and/or inferior results all too frequently. My experiments point to two dominating factors that can lead to such results: (1) problem instances may be "too easy"; (2) statistical tests include too many censored observations. For more details about these factors, see the listing of articles and slides on my home page <https://people.engr.ncsu.edu/brglez/publications.html>. The common threads are: (1) problem instances are consistently hard and only get harder as the instance size increases; (2) statistical tests are based strictly on uncensored mean first-passage-time observations.

(C) Recent research projects with undergraduate and graduate students:

1. Franc Brglez, Eason Li. Uncensored First Passage Time Experiments in Stochastic Combinatorial Optimization: a Masterclass with rBed.01. December 2021. <https://people.engr.ncsu.edu/brglez/publications.html>.
2. Eason Li, Franc Brglez. Asymptotic Experiments with Data Structures: Bipartite Graph Matchings and Covers. November 2021. <https://people.engr.ncsu.edu/brglez/publications.html>.

3. Franc Brglez, Edward Chan, Haiyan Deng, Sanket Goutam, Jun Ma, George Mathew, Yiqi Tang. Throwing Darts and Needles under Four Configurations: the Uncensored Mean First-Passage-Time of Hitting the k Decimal Digits Value of π . For a preprint, see <https://people.engr.ncsu.edu/brglez/publications/OPUS2-2018-pi-tufte-Brglez.pdf>.
4. Franc Brglez, Yang Ho, and Johnny Nguyen. On Asymptotic Complexity of Linear Ordering the Paley Tournament Graphs: First Prototypes with Self-Avoiding Walks. For a preprint, see <https://people.engr.ncsu.edu/brglez/publications/OPUS2-2017-lop-arxiv-Brglez-short.pdf>.
5. Franc Brglez and Young J. Pyun. On the Use of Isomorphs to Enhance the Teaching and the Grading Methods in a Data Structures Course <https://people.engr.ncsu.edu/brglez/publications/OPUS2-2005-CSC316-arxiv-Brglez.pdf>.

(D) Selections from recent publications:

1. Franc Brglez. On Uncensored Mean First-Passage-Time Performance Experiments with Multi-Walk in R^p : a New Stochastic Optimization Algorithm. Invited talk, IEEE Proc. 7th Int. Conf. on Reliability, InfoCom Technologies and Optimization (ICRITO'2018); Amity University, Noida, India, Aug. 29–31, 2018. <https://people.engr.ncsu.edu/brglez/publications/OPUS2-2018-mwr-ICRITO-Brglez.pdf>.
2. Franc Brglez, Borko Bošković, and Janez Brest. On Asymptotic Complexity of the Optimum Golomb Ruler Problem: From Established Stochastic Methods to Self-Avoiding Walks. *Proceedings of the IEEE Congress on Evolutionary Computation, June 5-8, Donostia – San Sebastian, Spain, 2017*. <https://people.engr.ncsu.edu/brglez/publications/OPUS2-2017-ogr-CEC-Brglez-9pages.pdf>.
3. Borko Bošković, Franc Brglez, and Janez Brest. Low-Autocorrelation Binary Sequences: On Improved Merit Factors and Runtime Predictions to Achieve Them. *Applied Soft Computing Journal – Elsevier*, 2017. <http://dx.doi.org/10.1016/j.asoc.2017.02.024> See also <https://arxiv.org/abs/1406.5301>.
4. Franc Brglez. Self-Avoiding Walks across n-Dimensional Dice and Combinatorial Optimization: An Introduction. *Informacije MIDE M, English Edition*, 44(1):53–68, 2014. [http://www.midem-drustvo.si/Journal%20papers/MIDEM_44\(2014\)1p53.pdf](http://www.midem-drustvo.si/Journal%20papers/MIDEM_44(2014)1p53.pdf) Invited talk, MIDE M-2013, September, Kranjska Gora, Slovenia. See also <http://arxiv.org/abs/1309.7508>.
5. Franc Brglez. Of n-dimensional Dice, Combinatorial Optimization, and Reproducible Research: An Introduction. *Eletrotehniški Vestnik, English Edition*, 78(4):181–192, 2011. <http://ev.fe.uni-lj.si/4-2011/Brglez.pdf> Invited talk, ERK-2011, September, Portorož, Slovenia.
6. Franc Brglez, Xiao Y. Li, and Matthias F. Stallmann. On SAT instance classes and a method for reliable performance experiments with SAT solvers. *Ann. Math. Art. Intell.*, 43(1):1–34, 2005. <http://portal.acm.org/citation.cfm?id=1036204>.
7. Franc Brglez and Jason A. Osborne. Performance Testing of Combinatorial Solvers With Isomorph Class Instances. In *ACM-FCRC, Proceedings of the 2007 workshop on Experimental computer science (ExpCS '07)*, 2007. <http://doi.acm.org/10.1145/1281700.1281713>.
8. Xiao Y. Li, Matthias F. Stallmann, and Franc Brglez. Effective bounding techniques for solving unate and binate covering problems. In *DAC '05: Proceedings of the 42nd annual conference on Design Automation*, pages 385–390, New York, NY, USA, 2005. ACM. <http://doi.acm.org/10.1145/1065579.1065682>.
9. Matthias Stallmann, Franc Brglez, and Debabrata Ghosh. Heuristics, experimental subjects, and treatment evaluation in bigraph crossing minimization. *J. Exp. Algorithmics*, 6:8, 2001. <http://doi.acm.org/10.1145/945394.945402>.
10. Justin E. Harlow III and Franc Brglez. Design of Experiments and Evaluation of BDD Ordering Heuristics. *International Journal on Software Tools for Technology Transfer (STTT)*, 3(2):193–206, 2001. <https://people.engr.ncsu.edu/brglez/publications/OPUS2-2001-BDD-STTT-Harlow.pdf>.

(E) Service activities:

1998-2013: Coordinator of the Computer Science as well as the Triangle Computer Science Distinguished Lecturer (TCS DLS) seminars. Recipient of two ARO grants to support a 3-way TCS DLS coordination and speaker honoraria as well as the archival posting of 49 TCS DLS videos under https://www.youtube.com/playlist?list=PL7A658A855DE33DF9&feature=view_all.

1988-1995: ACM SIGDA Board Member

1989-1992: Associate Editor, IEEE Transactions on Computer-Aided Design

1996-2000: Associate Editor, IEEE Transactions on Computer-Aided Design