Emanuele Giaquinta

Personal Data

E-Mail	e.giaquinta@fastmail.fm
Web	https://exg.github.io https://github.com/exg https://www.openhub.net/accounts/egiaquinta

Professional Experience

Nov. 2023 - present	*Staff Software Engineer*, Aiven, Finland
Aug. 2022 - Oct. 2023	*Lead Architect*, WithSecure (F-Secure), Finland R&D - Detection and Response backend system: WithSecure Elements Endpoint Detection and Response, WithSecure Countercept
Aug. 2021 - Jul. 2022	*Lead Developer*, WithSecure (F-Secure), Finland R&D - Detection and Response backend system: WithSecure Elements Endpoint Detection and Response, WithSecure Countercept
Sep. 2018 - Jul. 2021	*Lead Developer*, WithSecure (F-Secure), Finland R&D - Linux Endpoint Protection products: WithSecure Business Suite, WithSecure Elements Endpoint Protection, WithSecure Elements Endpoint Detection and Response
Feb. 2017 - Aug. 2018	*Senior Developer*, WithSecure (F-Secure), Finland
May. 2016 - Jan. 2017	*Software Engineer*, WithSecure (F-Secure), Finland
Sep. 2014 - Apr. 2016	*Postdoctoral Researcher*, Department of Computer Science, Aalto University, Finland Supervisor: Prof. Jorma Tarhio
Feb. 2012 - Aug. 2014	*Postdoctoral Researcher*, Department of Computer Science, University of Helsinki, Finland Supervisor: Prof. Esko Ukkonen

Education and Training

Mar. 3 2011	Ph.D. in Computer Science, University of Catania, Italy Dissertation title: Advancements in finite-state methods for string matching Advisor: Prof. D. Cantone
Sep. 8 - 19 2008	17th Summer School on Parallel Computing - CINECA, Casalecchio di Reno (Bologna), Italy
Sep. - Oct. 2007	*Visiting student*, Department of Computer Science, Czech Technical University in Prague, Czech Republic Supervisor: Prof. Jan Holub

Apr. 27 2007	M.Sc. in Computer Science *cum laude*, University of Catania, Italy

Languages

Italian · mother tongue

English · fluent

Finnish · basic (CEF: A2 / YKI: 2)

Teaching

2016	String Algorithms: Lecturer, Aalto University
2014	Project in Biological Sequence Analysis: Lecturer, University of Helsinki
2013	Scientific Writing for MSc in Computer Science: Instructor, University of Helsinki

Skills

C, C++17, Go, Python, Rust, TypeScript, Unix Shell

System programming in Unix and POSIX environments

Design and development of event-driven microservice architectures using Amazon Web Services

Theoretical and applied knowledge of *string processing* algorithms

Software Development

2023-present	ormsgpack (developer)
2006-2017	rxvt-unicode (developer)
2006-2009	irssi (developer)
2006	Gentoo Linux (developer)
	xterm, GNU Emacs, MPlayer, and others (contributor)

Publications

[1] Georgios Zacharopoulos, Lorenzo Ferretti, Emanuele Giaquinta, Giovanni Ansaloni, and Laura Pozzi. Regionseeker: Automatically identifying and selecting accelerators from application source code. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 38(4):741–754, 2019. ISSN 0278-0070. URL https://doi.org/10.1109/TCAD.2018.2818689.

[2] Jorma Tarhio, Jan Holub, and Emanuele Giaquinta. Technology beats algorithms (in exact string matching). *Software Practice and Experience*, 47(12):1877–1885, 2017. ISSN 1097-024X. URL https://doi.org/10.1002/spe.2511.

[3] Tamanna Chhabra, Emanuele Giaquinta, and Jorma Tarhio. Filtration algorithms for approximate order-preserving matching. In Costas S. Iliopoulos, Simon J. Puglisi, and Emine Yilmaz, editors, *SPIRE*, volume 9309 of *Lecture Notes in Computer Science*, pages 177–187. Springer, 2015. ISBN 978-3-319-23825-8. URL https://doi.org/10.1007/978-3-319-23826-5_18.

[4] Emanuele Giaquinta. Run-length encoded nondeterministic KMP and suffix automata. In Frank Drewes, editor, *CIAA*, volume 9223 of *Lecture Notes in Computer Science*, pages 102–113. Springer, 2015. ISBN 978-3-319-22359-9. URL https://doi.org/10.1007/978-3-319-22360-5_9.

[5] Tomas Flouri, Emanuele Giaquinta, Kassian Kobert, and Esko Ukkonen. Longest common substrings with k mismatches. *Information Processing Letters*, 115(6-8):643–647, 2015. ISSN 0020-0190. URL https://doi.org/10.1016/j.ipl.2015.03.006.

[6] Emanuele Giaquinta, Anadi Mishra, and Laura Pozzi. Maximum convex subgraphs under I/O constraint for automatic identification of custom instructions. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 34(3):483–494, 2015. ISSN 0278-0070. URL https://doi.org/10.1109/TCAD.2014.2387375.

[7] Sukhpal Singh Ghuman, Emanuele Giaquinta, and Jorma Tarhio. Alternative algorithms for Lyndon factorization. In Jan Holub and Jan Zdárek, editors, *PSC*, pages 169–178. Department of Theoretical Computer Science, Faculty of Information Technology, Czech Technical University in Prague, 2014. ISBN 978-80-01-05547-2. URL http://www.stringology.org/event/2014/p16.html.

[8] Emanuele Giaquinta, Kimmo Fredriksson, Szymon Grabowski, Alexandru I. Tomescu, and Esko Ukkonen. Motif matching using gapped patterns. *Theoretical Computer Science*, 548:1–13, 2014. ISSN 0304-3975. URL https://doi.org/10.1016/j.tcs.2014.06.032.

[9] Kimmo Fredriksson and Emanuele Giaquinta. On a compact encoding of the swap automaton. *Information Processing Letters*, 114(7):392–396, 2014. ISSN 0020-0190. URL https://doi.org/10.1016/j.ipl.2014.01.004.

[10] Domenico Cantone, Simone Faro, and Emanuele Giaquinta. Text searching allowing for inversions and translocations of factors. *Discrete Applied Mathematics*, 163:247–257, 2014. ISSN 0166-218X. URL https://doi.org/10.1016/j.dam.2013.05.016.

[11] Emanuele Giaquinta, Kimmo Fredriksson, Szymon Grabowski, and Esko Ukkonen. Motif matching using gapped patterns. In Thierry Lecroq and Laurent Mouchard, editors, *IWOCA*, volume 8288 of *Lecture Notes in Computer Science*, pages 448–452. Springer, 2013. ISBN 978-3-642-45277-2. URL https://doi.org/10.1007/978-3-642-45278-9_41.

[12] Ferdinando Cicalese, Travis Gagie, Emanuele Giaquinta, Eduardo Sany Laber, Zsuzsanna Lipták, Romeo Rizzi, and Alexandru I. Tomescu. Indexes for jumbled pattern matching in strings, trees and graphs. In Oren Kurland, Moshe Lewenstein, and Ely Porat, editors, *SPIRE*, volume 8214 of

Lecture Notes in Computer Science, pages 56–63. Springer, 2013. ISBN 978-3-319-02431-8. URL https://doi.org/10.1007/978-3-319-02432-5_10.

[13] Emanuele Giaquinta, Szymon Grabowski, and Esko Ukkonen. Fast matching of transcription factor motifs using generalized position weight matrix models. *Journal of Computational Biology*, 20(9):621–630, 2013. ISSN 1066-5277. URL https://doi.org/10.1089/cmb.2012.0289.

[14] Emanuele Giaquinta and Laura Pozzi. An effective exact algorithm and a new upper bound for the number of contacts in the hydrophobic-polar two-dimensional lattice model. *Journal of Computational Biology*, 20(8):593–609, 2013. ISSN 1066-5277. URL https://doi.org/10.1089/cmb.2012.0266.

[15] Emanuele Giaquinta, Szymon Grabowski, and Kimmo Fredriksson. Approximate pattern matching with k-mismatches in packed text. *Information Processing Letters*, 113(19-21):693–697, 2013. ISSN 0020-0190. URL https://doi.org/10.1016/j.ipl.2013.07.002.

[16] Emanuele Giaquinta and Szymon Grabowski. New algorithms for binary jumbled pattern matching. *Information Processing Letters*, 113(14-16):538–542, 2013. ISSN 0020-0190. URL https://doi.org/10.1016/j.ipl.2013.04.013.

[17] Domenico Cantone, Simone Faro, and Emanuele Giaquinta. A compact representation of nondeterministic (suffix) automata for the bit-parallel approach. *Information and Computation*, 213:3–12, 2012. ISSN 0890-5401. URL https://doi.org/10.1016/j.ic.2011.03.006.

[18] Domenico Cantone, Simone Faro, and Emanuele Giaquinta. On the bit-parallel simulation of the nondeterministic Aho-Corasick and suffix automata for a set of patterns. *Journal of Discrete Algorithms*, 11:25–36, 2012. ISSN 1570-8667. URL https://doi.org/10.1016/j.jda.2011.02.001.

[19] Domenico Cantone, Simone Faro, and Emanuele Giaquinta. Adapting Boyer-Moore-like algorithms for searching Huffman encoded texts. *International Journal of Foundations of Computer Science*, 23(2):343–356, 2012. ISSN 0129-0541. URL https://doi.org/10.1142/S0129054112400163.

[20] Matteo Campanelli, Domenico Cantone, Simone Faro, and Emanuele Giaquinta. Pattern matching with swaps in practice. *International Journal of Foundations of Computer Science*, 23(2):323–342, 2012. ISSN 0129-0541. URL https://doi.org/10.1142/S0129054112400151.

[21] Szymon Grabowski, Simone Faro, and Emanuele Giaquinta. String matching with inversions and translocations in linear average time (most of the time). *Information Processing Letters*, 111(11):516–520, 2011. ISSN 0020-0190. URL https://doi.org/10.1016/j.ipl.2011.02.015.

[22] Domenico Cantone, Simone Faro, and Emanuele Giaquinta. Approximate string matching allowing for inversions and translocations. In Jan Holub and Jan Zdárek, editors, *PSC*, pages 37–51. Department of

Theoretical Computer Science, Faculty of Information Technology, Czech Technical University in Prague, 2010. ISBN 978-80-01-04597-8. URL http://www.stringology.org/event/2010/p04.html.

[23] Domenico Cantone, Simone Faro, and Emanuele Giaquinta. A compact representation of nondeterministic (suffix) automata for the bit-parallel approach. In Amihood Amir and Laxmi Parida, editors, *CPM*, volume 6129 of *Lecture Notes in Computer Science*, pages 288–298. Springer, 2010. ISBN 978-3-642-13508-8. URL https://doi.org/10.1007/978-3-642-13509-5_26.

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[25] Domenico Cantone, Simone Faro, and Emanuele Giaquinta. Adapting Boyer-Moore-like algorithms for searching Huffman encoded texts. In Jan Holub and Jan Zdárek, editors, *PSC*, pages 29–39. Department of Computer Science and Engineering, Faculty of Electrical Engineering, Czech Technical University in Prague, 2009. ISBN 978-80-01-04403-2. URL http://www.stringology.org/event/2009/p04.html.

[26] Matteo Campanelli, Domenico Cantone, Simone Faro, and Emanuele Giaquinta. An efficient algorithm for approximate pattern matching with swaps. In Jan Holub and Jan Zdárek, editors, *PSC*, pages 90–104. Department of Computer Science and Engineering, Faculty of Electrical Engineering, Czech Technical University in Prague, 2009. ISBN 978-80-01-04403-2. URL http://www.stringology.org/event/2009/p09.html.

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