

Curriculum Vitae

Name and surname

Christian Günther

Contact information

Work address:

Martin Luther University Halle-Wittenberg, Institute of Mathematics, Theodor-Lieser-Str. 5, 06120 Halle (Saale), Germany

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Education

Ph.D. degree “Mathematics”: November 2018; Martin Luther University Halle-Wittenberg, Germany; dissertation title: “On generalized-convex constrained multi-objective optimization and application in location theory”; advisor: Prof. Dr. Christiane Tammer

Master degree “Business Mathematics”: October 2013; Martin Luther University Halle-Wittenberg, Germany; thesis title: “Dekomposition mehrkriterieller Optimierungsprobleme und Anwendung bei nichtkonvexen Standortproblemen”; advisor: Prof. Dr. Christiane Tammer

Bachelor degree “Business Mathematics”: October 2011; Martin Luther University Halle-Wittenberg, Germany; thesis title: “Standort-Medianprobleme mit variablen Anlagen”; advisor: Prof. Dr. Christiane Tammer

Grants

06/2014 - 06/2017:

Supported by the state of Saxony-Anhalt (Graduate scholarship)

Languages

German and English

Positions held

05/2018 - :

Research assistant in the working group “Optimization” of Prof. Dr. Christiane Tammer (Institute of Mathematics, Martin Luther University Halle-Wittenberg, Germany).

11/2017 – 04/2018:

Research assistant in the working group “Bioinformatics” of Prof. Dr. Ivo Grosse (Institute of Informatics, Martin Luther University Halle-Wittenberg, Germany).

Awards

2015: Student research award sponsored by Dr. Jan Spitzner at the Martin Luther University Halle-Wittenberg

Courses taught

- Lecture “**Operations Research**” (Wintersemester 2018/2019, Institute of Mathematics, Martin Luther University Halle-Wittenberg).
- Exercise “**Linear Optimization**” (Summersemester 2018, Institute of Mathematics, Martin Luther University Halle-Wittenberg).
- Exercise “**Nonlinear Optimization**” (Summersemester 2018, Institute of Mathematics, Martin Luther University Halle-Wittenberg).
- Exercise “**DNA Sequence Analysis**” (Wintersemester 2017/2018, Institute of Informatics, Martin Luther University Halle-Wittenberg).
- Tutorial “**Analysis I and II**” (in the period between Wintersemester 2010/2011 and Summersemester 2013 at the Institute of Mathematics of the Martin Luther University Halle-Wittenberg).

Main research interests

Mathematics

Multi-Objective Optimization, Convex Analysis, Generalized Convex Analysis, Duality Theory

Applications

Location Theory, Bioinformatics, Statistical Mechanics, Economics

Research stays and collaborations

04/2016 - Invited guest at the Babes-Bolyai University Cluj-Napoca, Romania

Cooperation with Prof. Dr. Nicolae Popovici; External collaborator in the project “The structure and sensitivity of the solution sets of variational inequalities, optimization and equilibrium problems under generalized monotonicity”

(see http://www.cs.ubbcluj.ro/~grupanopt/PN-II-ID-PCE-2011-3-0024/index_eng.htm).

Research projects

Project Facility Location Optimizer

Facility Location Optimizer (FLO) is a MATLAB-based software for solving different types of single- as well as multi-objective location problems. The development of the software started in 2011 with the initiation of my Bachelor's thesis under the supervision of Prof. Dr. Christiane Tammer. During my master program, which included the completion of a Master's thesis, the program continued to evolve under my active development. Since April 22, 2015, the Software FLO can be downloaded for free

(see <http://www.project-flo.de>).

Other professional activities

Guest editor of:

Applied Analysis and Optimization - Special Issue on “International Workshop on Applied Analysis and Optimization (IWAAO 2018)” which was held in Taichung (Taiwan) on 30-31 May, 2018.

Referee of:

Journal of Multi-Criteria Decision Analysis,
Journal of Optimization Theory and Applications,
Optimization,
Optimization Letters

Reviewer of:

Mathematical Reviews

Member of the Organizing Committee of International Conference on Variational Analysis and Nonsmooth Optimization (ICVANO) - dedicated to Boris Mordukhovich (Halle (Saale), Germany, June 28 – July 01, 2018)

Publications**Book chapters**

1. C. Günther : **Vectorial penalization in multi-objective optimization**, Chapter 9 in “Variational Analysis and Set Optimization”, A. Khan, E. Köbis, and C. Tammer (Eds.), CRC Press (Taylor & Francis Group), pp. 233-263, 2019.

Research articles in peer-reviewed journals

1. C. Günther, C. Tammer, and J.-C. Yao : **Necessary optimality conditions in generalized convex multi-objective optimization involving nonconvex constraints**, Applied Analysis and Optimization, Volume 2, Issue 3, pp. 403-421, 2018.
2. C. Günther and N. Popovici : **New algorithms for discrete vector optimization based on the Graef-Younes method and cone-monotone sorting functions**, Optimization, Volume 6, Number 7, pp. 975-1003, 2018 (DOI: [10.1080/02331934.2018.1474469](https://doi.org/10.1080/02331934.2018.1474469)).
3. C. Günther : **Pareto efficient solutions in multi-objective optimization involving forbidden regions**, Revista de Investigacion Operacional, Volume 39, Issue 3, pp. 353-390, 2018.
4. C. Günther and C. Tammer : **On generalized-convex constrained multi-objective optimization**, Pure and Applied Functional Analysis, Volume 3, Issue 3, pp. 429-461, 2018.
5. S. Alzorba, C. Günther, N. Popovici, and C. Tammer : **A new algorithm for solving planar multiobjective location problems involving the Manhattan norm**, European Journal of Operational Research, Volume 258, Issue 1, pp. 35-46, 2017 (DOI: [10.1016/j.ejor.2016.10.045](https://doi.org/10.1016/j.ejor.2016.10.045)).
6. C. Günther and C. Tammer : **Relationships between constrained and unconstrained multi-objective optimization and application in location theory**, Mathematical Methods of Operations Research, Volume 84, Issue 2, pp. 359-387, 2016 (DOI: [10.1007/s00186-016-0547-z](https://doi.org/10.1007/s00186-016-0547-z)).
7. S. Alzorba, C. Günther and N. Popovici : **A special class of extended multicriteria location problems**, Optimization, Volume 64, Issue 5, pp. 1305-1320, 2015 (DOI: [10.1080/02331934.2013.869810](https://doi.org/10.1080/02331934.2013.869810)).

Conference proceedings

1. S. Alzorba and C. Günther : **Algorithms for multicriteria location problems**, Numerical Analysis and Applied Mathematics ICNAAM, AIP Conference Proceedings, Vol. 1479, pp. 2286-2289, 2012 (DOI: [10.1063/1.4756650](https://doi.org/10.1063/1.4756650)).

Selected talks

- **On the efficiency concept in vector optimization with respect to polyhedral ordering cones**, Colloquium Vector- and Set-Valued Optimization, Wittenberg, Germany, October 25-26, 2018.
- **Pareto efficient solutions in multi-objective optimization involving forbidden regions**, 16th EUROPT Workshop on Advances in Continuous Optimization, Almería, Spain, July 12-13, 2018.
- **On generalized-convex constrained multi-objective optimization and application in location theory**, 29th European Conference On Operational Research (EURO), Valencia, Spain, July 8-11, 2018.
- **Jahn-Graef-Younes type algorithms for discrete vector optimization based on cone-monotone sorting functions**, Third Central European Set-Valued and Variational Analysis Meeting (CESVVAM), Chemnitz, Germany, November 25, 2017.
- **Jahn-Graef-Younes type algorithms for discrete vector optimization based on cone-monotone sorting functions**, 18th French - German - Italian Conference on Optimization, Paderborn, Germany, September 25-28, 2017.

Citations

The article [C. Günther and Chr. Tammer : **Relationships between constrained and unconstrained multi-objective optimization and application in location theory**, Mathematical Methods of Operations Research, Volume 84, Issue 2, pp. 359-387, 2016] cited in:

- M. Durea, R. Strugariu, and C. Tammer : On Some Methods to Derive Necessary and Sufficient Optimality Conditions in Vector Optimization, Journal of Optimization Theory and Applications, Volume 175, Issue 3, pp. 738-763, 2017.

The article [S. Alzorba, C. Günther, N. Popovici, and C. Tammer : **A new algorithm for solving planar multiobjective location problems involving the Manhattan norm**, European Journal of Operational Research, Volume 258, Issue 1, pp. 35-46, 2017] cited in:

- C. Bosch, C.L. García, T. Gilsdorf, C. Gómez-Wulschner, and R.Vera : Fixed points of set-valued maps in locally complete spaces, Fixed Point Theory and Applications, Volume 2017, 2017.
- T. Chelmuş, M. Durea, E.-A. Florea : Directional Pareto efficiency: concepts and optimality conditions, arXiv:1808.09133 [math.OC], 2018.