

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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Websites

<https://www2.mathematik.uni-halle.de/guenther/>

<https://project-flo.de/>

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”; grade: **summa cum laude**; advisor: Prof. Dr. Christiane Tammer

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

Grants

01/2014 - 06/2017:

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

Languages

German and English

Positions held

10/2020 – today :

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

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

04/2020 - 09/2020:

Substitute professorship for “Numerik der optimalen Steuerung ” at the Institute of Numerical Mathematics of the Technical University Dresden,
Lecturer of the courses “Mathematics II for chemists, “Discrete Optimization” and “Vector Optimization”.

09/2019 – 03/2020:

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

05/2018 – 07/2019:

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

2019: Luther Certificate of the Martin Luther University Halle-Wittenberg for Doctorate with the grade “summa cum laude”

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

Courses taught

- Exercise “**Statistical pattern recognition in DNA sequences**” (Wintersemester 2021/2022, Institute of Informatics, Martin Luther University Halle-Wittenberg).
- Exercise “**Expression data analysis**” (Sommersemester 2021, Institute of Informatics, Martin Luther University Halle-Wittenberg).
- Lecture “**Optimization 2 (Operations Research)**” (Wintersemester 2020/2021, Institute of Mathematics, Martin Luther University Halle-Wittenberg).
- Seminar “**Optimization**” (Wintersemester 2020/2021, Institute of Mathematics, Martin Luther University Halle-Wittenberg).
- Exercise “**Statistical pattern recognition in DNA sequences**” (Wintersemester 2020/2021, Institute of Informatics, Martin Luther University Halle-Wittenberg).

- Lecture “**Vector Optimization**” (Summersemester 2020, Institute of Numerical Mathematics, Technical University Dresden).
- Lecture “**Discrete Optimization**” (Summersemester 2020, Institute of Numerical Mathematics, Technical University Dresden).
- Lecture “**Mathematics 2 for Chemists**” (Summersemester 2020, Institute of Numerical Mathematics, Technical University Dresden).
- Exercise “**Statistical pattern recognition in DNA sequences**” (Wintersemester 2019/2020, Institute of Informatics, Martin Luther University Halle-Wittenberg).
- Exercise “**Linear Optimization**” (Summersemester 2019, Institute of Mathematics, Martin Luther University Halle-Wittenberg).
- Exercise “**Nonlinear Optimization**” (Summersemester 2019, Institute of Mathematics, Martin Luther University Halle-Wittenberg).
- Lecture “**Optimization 2 (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 “**Statistical pattern recognition in DNA sequences**” (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

02/2020 - Visiting Professor at Department of Economics of the University of Insubria, Varese, Italy:

Cooperation with Dr. Enrico Moretto (University of Insubria, Varese, Italy) and Prof. Dr. Nicolae Popovici (Babes-Bolyai University, Cluj-Napoca, Romania) on the field of Portfolio Optimization.

Invited Lecture 1: “Computing Edgeworth-Pareto optima of a set of alternatives using utility functions”

Invited Lecture 2: “Computing minimal elements of sets w.r.t. general binary relations and application in utility theory”

11/2019 - Invited research stay at Babes-Bolyai University, Faculty of Mathematics and Computer Science, Cluj-Napoca, Romania:

Cooperation with Prof. Dr. Nicolae Popovici; External collaborator in the project "Equilibrium and optimization problems: theoretical and computational approaches"

Link: <http://www.cs.ubbcluj.ro/~grupanopt/PN-III-P4-ID-PCE-2016-0190/>

Invited talk: "Relationships between Clarke-Ye type penalization and vectorial penalization in multi-objective optimization", Seminar of the Research Group on Analysis and Optimization, Babes-Bolyai University, Faculty of Mathematics and Computer Science, Cluj-Napoca

04/2016 - Invited research stay at Babes-Bolyai University, Faculty of Mathematics and Computer Science, 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"

Link: <http://www.cs.ubbcluj.ro/~grupanopt/PN-II-ID-PCE-2011-3-0024/>

Invited talk: "Relationships between constrained and unconstrained multi-objective optimization", Seminar of the Research Group on Analysis and Optimization, Babes-Bolyai University, Faculty of Mathematics and Computer Science, Cluj-Napoca

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

Editor of:

Journal "Studia Mathematica"
<http://studia.ubbcluj.ro/serii/mathematica/>

Guest editor of:

Special Issue in "Applied Set-Valued Analysis and Optimization (ASVAO)" dedicated to a Colloquium on Set- and Vector Optimization 2020 (Wittenberg, Germany, October 22-23, 2020)

Special Issue in "Applied Analysis and Optimization (AAO)" dedicated to the Workshop on Applied Analysis and Optimization (IWAAO 2019, Taichung (Taiwan), May 30-31, 2019)

Special Issue in "Applied Analysis and Optimization (AAO)" dedicated to the Workshop on Applied Analysis and Optimization (IWAAO 2018, Taichung (Taiwan), May 30-31, 2018)

Referee of:

Journal of Multi-Criteria Decision Analysis (JMCDA), Journal of Optimization Theory and Applications (JOTA), Mathematical Methods of Operations Research (MMOR), Optimization, Optimization Letters, Research and Communications in Mathematics and Mathematical Science, SIAM Journal on Optimization (SIOPT)

Reviewer of:

Mathematical Reviews

Member of:

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

Organizing Committee of International Conference on Variational Analysis and Nonsmooth Optimization (ICVANO) dedicated to Christiane Tammer (July 15-16, 2021)

Organizing Team of "Colloquium on Set- and Vector Optimization" (Wittenberg, 2014-2021)

Publications

Thesis

1. C. Günther: **On generalized-convex constrained multi-objective optimization and application in location theory**, Dissertation, Martin Luther University Halle-Wittenberg, 2018 (DOI: [10.25673/13602](https://doi.org/10.25673/13602))

Book chapters

2. 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

3. C. Günther, Khazayel, and C. Tammer: **Vector optimization w.r.t. relatively solid convex cones in real linear spaces**, Journal of Optimization Theory and Applications, 2021 (DOI: [10.1007/s10957-021-01976-y](https://doi.org/10.1007/s10957-021-01976-y))

4. B. Khazayel, A. P. Farajzadeh, C. Günther, and C. Tammer: **On the intrinsic core of convex cones in real linear spaces**, SIAM Journal of Optimization, Volume 31, Issue 2, pp. 1276–1298, 2021 (DOI: [10.1137/19M1283148](https://doi.org/10.1137/19M1283148))
5. C. Günther, E. Köbis and N. Popovici: **On strictly minimal elements w.r.t. preorder relations in set-valued optimization**, Applied Set-Valued Analysis and Optimization, Volume 1, Issue 3, pp. 205-219, 2019 (DOI: [10.23952/asvao.1.2019.3.02](https://doi.org/10.23952/asvao.1.2019.3.02))
6. C. Günther and N. Popovici: **The role of nonlinear scalarization functions in characterizing generalized convex vector functions**, Journal of Applied and Numerical Optimization, Volume 1, Issue 3, pp. 325-333, 2019 (DOI: [10.23952/jano.1.2019.3.09](https://doi.org/10.23952/jano.1.2019.3.09))
7. C. Günther and N. Popovici: **Characterizations of explicitly quasiconvex vector functions w.r.t. polyhedral cones**, Journal of Nonlinear and Convex Analysis, Volume 20, Issue 12, pp. 2653-2665, 2019 ([Link](#))
8. C. Günther, E. Köbis, and N. Popovici: **Computing minimal elements of finite families of sets w.r.t. preorder relations in set optimization**, Journal of Applied and Numerical Optimization, Volume 1, Issue 2, pp. 131-144, 2019 (DOI: [10.23952/jano.1.2019.2.04](https://doi.org/10.23952/jano.1.2019.2.04))
9. 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 ([Link](#))
10. 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, Issue 7, pp. 975-1003, 2018 (DOI: [10.1080/02331934.2018.1474469](https://doi.org/10.1080/02331934.2018.1474469))
11. C. Günther: **Pareto efficient solutions in multi-objective optimization involving forbidden regions**, Revista de Investigacion Operacional, Volume 39, Issue 3, pp. 353-390, 2018 ([free access](#))
12. 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 ([Link](#))
13. 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))
14. 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))

15. 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

16. 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))

Working papers

17. I. Große, C. Günther, and C. Tammer: New insights into Tsallis entropy maximization with mean energy constraints
18. I. Große, C. Günther, and C. Tammer: A modified Tsallis canonical ensemble with cut-off prescription
19. C. Günther and N. Popovici: A new concept of semistrict quasiconvexity for vector functions
20. C. Günther and N. Popovici: Linear and nonlinear transformations in vector optimization
21. C. Günther, E. Moretto, and N. Popovici: Computing Edgeworth-Pareto optima of a set of alternatives using utility functions
22. C. Günther, B. Khazayel, and C. Tammer: Duality assertions in vector optimization w.r.t. relatively solid convex cones

Selected talks

- **Vector optimization w.r.t. relatively solid convex cones in real linear spaces**, Workshop on Optimization and Operator Theory, 2021, Haifa, Israel, November 15-17, 2021 (online talk)
- **Numerical procedures for computing solutions of set optimization problems**, Workshop Optimization 2021, March 24-25, 2021 (online talk)
- **Computing minimal elements of finite families of sets w. r. t. preorder relations in set optimization**, Special Interest Group in Optimization (SIGOPT), 2020, Dortmund, Germany, March 04-06, 2020
- **Relationships between Clarke-Ye type penalization and vectorial penalization in multi-objective optimization**, 6th International Conference on Continuous Optimization (ICCOPT) 2019, Berlin, Germany, August 05-08, 2019
- **A penalization approach for vector optimization problems involving polyhedral ordering cones**, 30th European Conference on Operational Research (EURO) 2019, Dublin, Ireland, June 23-26, 2019
- **Vectorial penalization in multi-objective optimization and application in location theory**, EURO Working Group on Locational Analysis (EWGLA) XXV, 2019, Brussel, Belgium, June 05-07, 2019

- **Vectorial penalization in multi-objective optimization and applications**, International Workshop on Applied Analysis and Optimization, Taishung, Taiwan, May 30-31, 2019
- **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, Almeria, 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
- **On generalized-convex constrained multi-objective optimization and applications**, International Workshop on Applied Analysis and Optimization, Taishung, Taiwan, May 30-31, 2018
- **Jahn-Graef-Younes type algorithms for discrete vector optimization based on cone-monotone sorting functions**, 3th 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:

- F. Amir, A. Farajzadeh, and N. Petrot: Hybrid Proximal Point Algorithm for Solution of Convex Multiobjective Optimization Problem over Fixed Point Constraint, Thai Journal of Mathematics, Volume 18, Issue 3, pp. 841–850, 2020
- T. Chelmuş and M. Durea: Stability of minimality and criticality in directional set-valued optimization problems. Positivity, 2021
- 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
- G. Eichfelder, K. Klamroth, and J. Niebling: Nonconvex constrained optimization by a filtering branch and bound. Journal of Global Optimization, 2020
- B. Mordukhovich and M.N. Nguyen: The Fermat-Torricelli Problem and Weiszfeld's Algorithm in the Light of Convex Analysis, J. Appl. Numer. Optim. Volume 1, Issue 3, pp. 205-215, 2019, DOI: 10.23952/jano.1.2019.3.02

- J. E. Fieldsend, T. Chugh, R. Allmendinger, and K. Miettinen: A Visualizable Test Problem Generator for Many-Objective Optimization, *IEEE Transactions on Evolutionary Computation*, Volume 26, Issue 1, pp. 1-11, 2022, DOI: 10.1109/TEVC.2021.3084119.

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:

- R. Allmendinger, A. Jaszkievicz, A. Liefoghe, and C. Tammer: Many Objectives: Characterization and Structure, Sect. 4.1 (pp. 64-76) in: C.M. Fonseca, K.Klamroth, G. Rudolph, M.M. Wiecek(Eds.), *Scalability in Multiobjective Optimization*, Report from Dagstuhl Seminar 20031, January 12–17, 2020, DOI: 10.4230/DagRep.10.1.52
- 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 2017:13, 2017
- T. Chelmuş, M. Durea, and E.-A. Florea: Directional Pareto efficiency: concepts and optimality conditions, arXiv:1808.09133 [math.OC], 2018
- S. Nickel, J. Puerto, and A.M. Rodríguez-Chía: Location Problems with Multiple Criteria. In: Laporte G., Nickel S., Saldanha da Gama F. (eds) *Location Science*. Springer, 2019
- B. Mordukhovich and M.N. Nguyen: The Fermat-Torricelli Problem and Weiszfeld's Algorithm in the Light of Convex Analysis, *J. Appl. Numer. Optim.* Volume 1, Issue 3, pp. 205-215, 2019, DOI: 10.23952/jano.1.2019.3.02
- J. Zhou, S.C. Fang, S. Jiang, S. Ju: Optimal planar facility location with dense demands along a curve, *Journal of the Operational Research Society*, 2021, DOI: 10.1080/01605682.2021.1907237
- B. Zargini: Multiobjective Location Problems with Variable Domination Structures and an Application to Select a New Hub Airport. *Logistics*. Volume 6, Issue 2, 2022

The article [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] cited in:

- B. T. Kien, X. Qin, C.-F. Wen, and J.-C. Yao: Second-Order Optimality Conditions for Multiobjective Optimal Control Problems with Mixed Pointwise Constraints and Free Right End Point, *SIAM Journal on Control and Optimization* 2020 Volume 58, Issue 4, pp. 2658-2677, 2020
- Y.-B. Xiao, N.V. Tuyen, J.-C. Yao, and C.-F. Wen: Locally Lipschitz vector optimization problems: second-order constraint qualifications, regularity condition and KKT necessary optimality conditions, *Positivity*, pp. 1–25, 2019

The article [S. Alzorba, C. Günther and N. Popovici: **A special class of extended multicriteria location problems**, *Optimization*, Volume 64, Issue 5, pp. 1305-1320, 2015] cited in:

- S. Alzorba: Algorithms and decomposition methods for multiobjective location and approximation problems, Dissertation, Martin Luther University Halle-Wittenberg, 2015
- G. Eichfelder: Twenty Years of Continuous Multiobjective Optimization, Preprint Optimization-Online, 2020
- N. Fröhlich and S. Ruzika: Interdicting facilities in tree network, TOP, 2021, DOI: 10.1007/s11750-021-00600-6
- S. Nickel, J. Puerto, and A.M. Rodríguez-Chía: Location Problems with Multiple Criteria. In: G. Laporte, S. Nickel, and F. Saldanha da Gama (eds) Location Science. Springer, 2019
- A. Wagner: A new duality based approach for the problem of locating a semi-obnoxious facility, Dissertation, Martin Luther University Halle-Wittenberg, 2015

The article [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] cited in:

- G. Bouza, E. Quintana, and C. Tammer: A steepest descent method in set optimization for set-valued mappings of finite cardinality, Preprint Optimization-Online, 2021
- G. Eichfelder, P. Kirst, L. Meng, and O. Stein: A general branch-and-bound framework for continuous global multiobjective optimization. Journal of Global Optimization, 2021
- E. Quintana: On set optimization with set relations: a scalarization approach to optimality conditions and algorithms, Dissertation, Martin Luther University Halle-Wittenberg, 2020
- C. Tammer and P. Weidner: Scalarization and Separation by Translation Invariant Functions, Springer, 2020

The article [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] cited in:

- C. Tammer and P. Weidner: Scalarization and Separation by Translation Invariant Functions, Springer, 2020

The article [C. Günther, E. Köbis, and N. Popovici: **Computing minimal elements of finite families of sets w.r.t. preorder relations in set optimization**, Journal of Applied and Numerical Optimization, Volume 1, Issue 2, pp. 131-144, 2019] cited in:

- G. Eichfelder and S. Rocktäschel: Solving set-valued optimization problems using a multiobjective approach, Preprint Optimization-Online, 2021
- G. Bouza, E. Quintana, and C. Tammer: A steepest descent method in set optimization for set-valued mappings of finite cardinality, Preprint Optimization-Online, 2021
- E. Köbis, M. Köbis, and X. Qin: An Inequality Approach to Approximate Solutions of Set Optimization Problems in Real Linear Spaces, Mathematics, Volume, Issue 8, 2020

- E. Quintana: On set optimization with set relations: a scalarization approach to optimality conditions and algorithms, Dissertation, Martin Luther University Halle-Wittenberg, 2020

The article [C. Günther, E. Köbis, and N. Popovici: **On strictly minimal elements w.r.t. preorder relations in set-valued optimization**, Applied Set-Valued Analysis and Optimization, Volume 1, Issue 3, pp. 205-219, 2019] cited in:

- E. Quintana: On set optimization with set relations: a scalarization approach to optimality conditions and algorithms, Dissertation, Martin Luther University Halle-Wittenberg, 2020

The article [C. Günther and N. Popovici: **The role of nonlinear scalarization functions in characterizing generalized convex vector functions**, Journal of Applied and Numerical Optimization, Volume 1, Issue 2, pp. 131-144, 2019] cited in:

- L. Chen, M.S. Saleem, M.S. Zahoor, and R. Bano: Some Inequalities Related to Interval-Valued-Convex Functions, Journal of Mathematics, Volume 2021, Article ID 6617074, 2021
- H. M. Srivastava, G. Kaur, G. Singh: Estimates of the fourth Hankel determinant for a class of analytic functions with bounded turnings involving cardioid domains, Journal of Nonlinear and Convex Analysis, Volume 22, Issue 3, pp. 511-526, 2021

The article [B. Khazayel, A. P. Farajzadeh, C. Günther, and C. Tammer: **On the intrinsic core of convex cones in real linear spaces**, SIAM Journal of Optimization, Volume 31, Issue 2, pp. 1276–1298, 2021] cited in:

- D. V. Cuong, B. S. Mordukhovich, N. M. Nam, and G. Sandine: Fenchel–Rockafellar theorem in infinite dimensions via generalized relative interiors, Optimization, 2022, DOI: 10.1080/02331934.2022.2048383
- G. Eichfelder, E. Quintana, and S. Rocktäschel: A Vectorization Scheme for Nonconvex Set Optimization Problems, arXiv:2107.12274 [math.OC], 2021
- R. D. Millán and V. Roshchina: The intrinsic core and minimal faces of convex sets in general vector spaces, arXiv:2107.07730 [math.OC], 2021
- V. Novo and . Zălinescu: On Relatively Solid Convex Cones in Real Linear Spaces, Journal of Optimization Theory and Applications, Volume 188, pp. 277–290, 2021, DOI: 10.1007/s10957-020-01773-z

The software Facility Location Optimizer [C. Günther, M. Hillmann, C. Tammer, and B. Winkler: **Facility Location Optimizer (FLO) – A tool for solving location problems**, <http://www.project-flo.de>] cited in:

- M. Bogdanow: Standortplanungsmodelle: Softwarelösungen und deren praktische Bedeutung in Frachtumschlag und Lagerei, Schriftenreihe des Lehrstuhls für Logistikmanagement Nr. 1, Universität Bremen: Wirtschaftswissenschaften, 2018
- G. Eichfelder: Twenty Years of Continuous Multiobjective Optimization, Preprint Optimization Online, 2020
- A. Göpfert, T. Riedrich, and C. Tammer: Approximation und Nichtlineare Optimierung in Praxisaufgaben: Anwendungen aus dem Finanzbereich und der Standortplanung, Springer Spektrum, 2017
- A. Kumar et al.: A review of multi criteria decision making (MCDM) towards sustainable renewable energy development, Renewable and Sustainable Energy Reviews, Volume 69, pp. 596-609, 2017