

Algoritmi folosiți în optimizare

Anul înființării: 2018

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Scurtă descriere

Grupul de cercetare intitulat „Algoritmi folosiți în optimizare” a fost înființat în anul 2018 în cadrul Facultății de Matematică și informatică, Universitatea Transilvania din Brașov, cu scopul de a consolida o echipă cu preocupări comune de cercetare științifică, ale cărei idei să fie concretizate prin publicații în reviste bine cotate internațional (indexate ISI sau în baze de date recunoscute), cărți și, nu în ultimul rând, de a aplica pentru proiecte de cercetare la nivel național și internațional.

De-a lungul ultimelor decenii, cantitatea de informație care există și trebuie procesată a crescut într-un ritm din ce în ce mai alert. Această realitate conduce la necesitatea elaborării unor metode și algoritmi de optimizare indispensabili pentru abordarea diferitelor probleme practice din domenii precum inginerie, fizică, economie, finanțe, biologie, construcții, medicină etc. Echipa de cercetare din cadrul grupului dorește să găsească soluții de rezolvare pentru o gamă cât mai largă de probleme practice din aceste domenii.

De asemenea, se dorește găsirea unor parteneri din domeniul economic în vederea identificării unor probleme practice ce pot fi modelate și, ulterior, rezolvate în cadrul echipei, atrăgând astfel idei de cercetare și fonduri.

Articole publicate de către membrii echipei (ultimii 10 de ani):

1. **D.E. Spridon, A.M. Deaconu**, J Tayyebi, *Novel GPU-Based Method for the Generalized Maximum Flow Problem*, *Computation*, vol. 13(40), 2025, WOS:001429721100001
<https://doi.org/10.3390/computation13020040>
2. A. Băicoianu, R. Ivan, **I. Popa**, *Exploiting cellular automata and linear regression to predict disease spread*, *Bulletin of the Transilvania University of Brasov. Mathematics and Computer Science*, vol. 5(67), no. 1, pp. 241-258, 2025
<https://doi.org/10.31926/but.mif.2025.5.67.1.18>
3. **A.M. Deaconu**, J. Tayyebi, *Increasing the maximum capacity path in a network and its application for improving the connection between two routers*, *Tsinghua Science and Technology*, vol. 29(3), pp. 753-765, 2024, WOS:001123318200010
<https://ieeexplore.ieee.org/abstract/document/10339725>

4. **A.M. Deaconu**, D.T. Cotfas, P.A. Cotfas, *Extracting Photovoltaic Cells Parameters for Three Diode Model Using HSDA Algorithm*, Energy Reports, vol. 12, pp. 5096-5109, 2024, WOS:001356122600001
<https://www.sciencedirect.com/science/article/pii/S2352484724007066>
5. J. Tayyebi, **A. Deaconu**, E. Hosseinzadeh, A.M. Golmohammadi, *Fuzzy Maximum Capacity Path Problem and Its Application to Optimal Routing Control*, Iranian Journal of Fuzzy Systems, vol. 21(4), pp. 123-139, 2024, WOS:001353472100002
https://ijfs.usb.ac.ir/article_8543.html
6. I.C. Plajer, A. Băicoianu, **L. Majercsik**, M. Ivanovici, *Multisource Remote Sensing Data Visualization Using Machine Learning*, IEEE Transactions on Geoscience and Remote Sensing, vol. 62, pp. 1-12, 2024
<https://ieeexplore.ieee.org/abstract/document/10458686>
7. M.B. Khan, **A.M. Deaconu**, J. Tayyebi, **D.E. Spridon**, *Diamond intuitionistic fuzzy sets and their applications*, IEEE Access, vol. 12, pp. 176171 – 176183, 2024, WOS:001370660700024
<https://ieeexplore.ieee.org/abstract/document/10757388>
8. **D. Spridon**, **A. Deaconu**, I. Popa, J. Tayyebi, *New Approach for the Generalized Maximum Flow Problem*, 21st International Conference on Applied Computing, 2024
9. M. Niksirat, M. Saffarian, J. Tayyebi, **A.M. Deaconu**, **D.E. Spridon**, *Fuzzy Multi-Objective, Multi-Period Integrated Routing-Scheduling Problem to Distribute Relief to Disaster Areas: A Hybrid Ant Colony Optimization Approach*, Mathematics, 2024, vol. 12(18), WOS:001323641800001
<https://doi.org/10.3390/math12182844>
10. J. Tayyebi, **M.-L. Rîtan**, **A.M. Deaconu**, Generalized Maximum Capacity Path Problem with Loss Factors, in Proceedings of the 13th International Conference on Operations Research and Enterprise Systems (ICORES 2024), Rome, Italy, 2024
11. J. Tayyebi, **M.L. Rîtan**, **A.M. Deaconu**, *Widest Path in Networks with Gains/Losses*, Axioms, vol. 13(2), 127, 2024, WOS:001172018900001
<https://doi.org/10.3390/axioms13020127>
12. J. Tayyebi, **A.M. Deaconu**, H. Bigdeli, M. Niksirat, *Shortest path interdiction problem with convex piecewise-linear costs*, Computational and Applied Mathematics, vol. 42, pp. 1-20, 2023, WOS:001067497700001
<https://link.springer.com/article/10.1007/s40314-023-02445-0>
13. D. Spridon, **A.M. Deaconu**, **L. Ciupală**, *Fast CUDA Geomagnetic Map Builder*, International Conference on Computational Science and Its Applications – ICCSA 2023, Athens, Greece, Lecture Notes in Computer Science, vol. 13956, Springer, 2023, WOS:001166618800009
https://link.springer.com/chapter/10.1007/978-3-031-36805-9_9
14. **A.M. Deaconu**, D.E. Spridon, L. Ciupală, *Finding minimum loss path in big networks*, In Proceedings of 22nd International Symposium on Parallel and Distributed Computing (ISPDC 2023), Bucharest, Romania, pp. 39-44, IEEE, 2023
<https://ieeexplore.ieee.org/abstract/document/10272429>
15. **A.M. Deaconu**, D.T. Cotfas, P.A. Cotfas, *Advanced Optimization Methods and Applications*, Mathematics, vol. 11(9), 2205, 2023, WOS:000987388800001
<https://doi.org/10.3390/math11092205>
16. O. Deaconu, **A.M. Deaconu**, G.C. Chitonu, D. Taus, *The Online Teaching System as a Sustainable Way of Learning*, Sustainability 14 (18), 11556, 2022.
<https://doi.org/10.3390/su141811556>
17. **C.-Ş. Nănău**, Message priority MaxDelivery algorithm applied in earthquake communication situation, Bulletin of the Transilvania University of Brasov. Mathematics and Computer Science, vol. 2(64), no. 1, pp. 247-256, 2022
https://webbut.unitbv.ro/index.php/Series_III/article/view/3191

18. **E. Ciurea**, O. Georgescu, C. Schiopu, *Minimum Flows in Directed 1–n Planar Static and Dynamic Networks with Arcs and Nodes Capacities*, Journal of Circuits, Systems and Computers, Vol. 31, No. 07, 2230004, 2022
<https://www.worldscientific.com/doi/abs/10.1142/S0218126622300045>
19. L. Ciupală, **A. Deaconu**, L. Majercsik, *Shortest paths in a diagraph with an underestimated arc weight*, Bulletin of the Transilvania University of Brasov. Mathematics and Computer Science, vol. 2(64), no. 1, 247-256, 2022
https://webbut.unitbv.ro/index.php/Series_III/article/view/1872
20. D.T. Cotfas, **A.M. Deaconu**, P.A. Cotfas, *Hybrid successive discretisation algorithm used to calculate parameters of the photovoltaic cells and panels for existing datasets*, IET Renewable Power Generation, vol. 15, issue 15, pp. 3661-3687, 2021
<https://doi.org/10.1049/rpg2.12262>
21. G. Bhagwat, S. Kumari, V. Patekar, **A.M. Deaconu**, *Novel Static Multi-Layer Forest Approach and Its Applications*. Mathematics, 9, 2650, 2021
<https://doi.org/10.3390/math9212650>
22. **A.M. Deaconu**, D. Spridon, *Adaptation of Random Binomial Graphs for Testing Network Flow Problems Algorithms*, Mathematics, 9, 1716, 2021
<https://doi.org/10.3390/math9151716>
23. **A.M. Deaconu**, R. Udriou, **C.-Ş. Nănău**, *Algorithms for Delivery of Data by Drones in an Isolated Area Divided into Squares*, Sensors, 21(16), 5472, 2021
<https://doi.org/10.3390/s21165472>
24. **A.M. Deaconu**, L. Majercsik, *Flow Increment through Network Expansion*. Mathematics, 9, 2308, 2021
<https://doi.org/10.3390/math9182308>
25. **A.M. Deaconu**, O. Deaconu, *Heuristic and Numerical Geometrical Methods for Estimating the Elevation and Slope at Points Using Level Curves. Application for Embankments.*, Applied Sciences, 11, 6176, 2021
<https://doi.org/10.3390/app11136176>
26. R. Udriou, R., **A.M. Deaconu**, **C.-Ş. Nănău**, *Data Delivery in a Disaster or Quarantined Area Divided into Triangles Using DTN-Based Algorithms for Unmanned Aerial Vehicles*, Sensors, vol. 21, no. 11, 3572, 2021
<https://doi.org/10.3390/s21113572>
27. L. Ciupală, **A.M. Deaconu**, *Incremental minimum flow algorithms*, Mathematics, Vol. 9(9), 1025, 2021
<https://doi.org/10.3390/math9091025>
28. J. Tayyebi, **A.M. Deaconu**, *Expanding maximum capacity path under weighted sum-type distances*, AIMS Mathematics, Vol. 6, Issue 4, 3996-4000, 2021
<https://doi.org/10.3934/math.2021237>
29. **A.M. Deaconu**, D.T. Cotfas, P. A. Cotfas, *Calculation of Seven Photovoltaic Cells Parameters Using Parallelized Successive Discretization Algorithm*, International Journal of Photoenergy, Vol. 2020, 1-13, 2020
<https://onlinelibrary.wiley.com/doi/full/10.1155/2020/6669579>
30. L. Ciupală, **A. Deaconu**, D. Spridon, *IDW map builder and statistics of air pollution in Brasov*, Bulletin of the Transilvania University of Brasov. Mathematics and Computer Science, vol. 1(63), no. 1, 247-256, 2021
<https://doi.org/10.31926/but.mif.2020.13.62.1.25>
31. **A.M. Deaconu**, J. Tayyebi, *Inverse Maximum Capacity Path Problems under Sum-type and Max-type Distances and their Practical Application to Transportation Networks*, IEEE Access, vol. 8, 225957 – 225966, 2020
<https://doi.org/10.1109/ACCESS.2020.3045288>

32. **A. Deaconu, L. Ciupală**, *Inverse Minimum Cut Problem with Lower and Upper Bounds*, Mathematics, 8 (9), 1494, 2020
<https://doi.org/10.3390/math8091494>
33. **C.Ş. Nănău**, *MaxDelivery: a new approach to a DTN Buffer Management*, Proceeding of 21ST IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (IEEE WOWMOM 2020), Cork, Ireland, pp. 60-61, 2020
34. **L. Ciupală, A. Deaconu, D. Spridon**, *Algorithm for merging and interpolating clusters in overlapping images*, Bulletin of the Transilvania University of Brasov. Mathematics, Informatics, Physics. Series III, vol. 13(62), no. 2, 697-704, 2020
35. C. Şchiopu, **E. Ciurea**, *Maximum Flows in Planar Dynamic Networks. The Static Approach*, Romanian Journal of Information Science and Technology, Vol. 23, 2020
36. **C.Ş. Nănău**, *Maximum flow in buffer-limited delaytolerant networks. The static approach*, Bulletin of the Transilvania University of Brasov. Mathematics, Informatics, Physics. Series III, vol. 13, no. 1, 2020
37. **L. Ciupală, A. Deaconu, D. Spridon**, *Incremental minimum spanning tree algorithms*, Bulletin of the Transilvania University of Brasov. Mathematics, Informatics, Physics. Series III, vol. 13(62), no. 1, 343-346, 2020
38. D.T. Cotfas, **A.M. Deaconu**, P. A. Cotfas, *Application of successive discretization algorithm for determining photovoltaic cells parameters*, Energy Conversion and Management, Vol. 196, 545-556, 2019
<https://www.sciencedirect.com/science/article/pii/S0196890419307083>
39. V. Chiroiu, L. Munteanu, R. Ioan, C. Dagne, **L. Majercsik**, *Using the Sonification for Hardly Detectable Details in Medical Images*. Sci Rep 9, 17711, 2019
<https://doi.org/10.1038/s41598-019-54080-7>
40. **E. Ciurea**, C. Şchiopu, *Minimum Flows in Directed Planar Dynamic Networks*, 6th International Conference on Control, Decision and Information Technologies (CoDIT), 2019
41. **L. Ciupală, A. Deaconu**, *Minimum cost flow in a network with an overestimated arc capacity*, Bulletin of the Transilvania University of Brasov. Mathematics, Informatics, Physics. Series III, vol. 12, no. 1, 107-112, 2019
42. **L. Ciupală, A. Deaconu**, *Inverse maximum flow problem in planar networks*, Bulletin of the Transilvania University of Brasov, Vol 12 (61), 2019
43. J. Tayyebi, **A. Deaconu**, *Inverse Generalized Maximum Flow Problems*, Mathematics, 7 (10), 899, 2019
<https://doi.org/10.3390/math7100899>
44. **L. Majercsik**, L. Munteanu, *Direct and inverse problems for an inhomogeneous medium*, Romanian Journal of Technical Science-Applied Mechanics, Tome 64, № 1, pp.73-80, 2019
45. M. Parpalea, N. Avesalon, **E. Ciurea**, *Minimum parametric flow in time-dependent dynamic networks*, RAIRO - Theoretical Informatics and Applications, Volume 52, No. 1, pp. 43–53, 2018
46. C. Şchiopu, **E. Ciurea**, *Maximum flows in planar dynamic networks with lower bounds*, Fundamenta Informaticae, vol. 163, no. 2, 2018
47. I. Girip, **L. Majercsik**, R. Ioan, L. Munteanu, *On the propagation of evanescent waves in sonic composites*, Volume 60, Number 1-2, 2018 special issue, Mediamira Science Publisher. MEDIAMIRA ISSN 2344-5637, ISSN-L 1841-3323, pp.213-220, 2018
48. C. Şchiopu, **E. Ciurea**, *Two Flow Problems in Dynamic Networks*, International Journal of Computers, Communications & Control, 12(1): pp. 103-115, 2017
49. N. Avesalon, **E. Ciurea**, M. Parpalea, *The Maximum Parametric Flow in Discrete-time Dynamic Networks*, Fundamenta Informaticae, vol. 156, no. 2, pp. 125-139, 2017
50. L. Munteanu, **L. Majercsik**, V. Moşneguţu, *Sonoelastic determination of the knee cartilage elasticity*, Romanian Journal of Technical Science-Applied Mechanics, Tome 62, nr. 1, pp. 57-67, 2017

51. C. Şchiopu, **E. Ciurea**, *The maximum flows in planar dynamic networks*, International Journal of Computers Communications & Control, 11(2), pp. 282-291, 2016
52. M. Parpalea, **E. Ciurea**, *Minimum parametric flow. A partitioning approach.*, British Journal of Applied Science and Technology, 13(6), 2016
53. **L. Majercsik**, A. Gliozzi, L. Munteanu, *On the composites with negative stiffness inclusions*, Romanian Journal of Technical Science-Applied Mechanics, Tome 61, No. 2, pp. 161-175, 2016
<https://rjts-am.utcluj.ro/#titleIssue-2017-1>

Cărţi publicate de către membrii echipei:

1. **D.E. Spridon**, *Aplicații avansate ale programării pe GPU*, Editura Universității Transilvania, 2024
2. G. Moise, E.S. Nicoară, **A.M. Deaconu**, *Grafuri și fluxuri în rețele*, Editura MatrixRom, 2021
3. **C.-Ș. Nănău**, *Rețele cu toleranță la întârzieri: buffer management și aplicații*, Editura Universității Transilvania din Brașov, 2021
4. **A.M. Deaconu**, G. Moise, L.M. Sasu, *Inițiere în Java prin comentarii teoretice și aplicații*, Editura MatrixRom, 2020
5. A. Baicoianu, **L. Majercsik**, *Algoritmi fundamentali – Ghid practic pentru curs și laborator. O perspectivă C++*, Editura Universitatii Transilvania, 2020
6. M.Jianu, A.N. Marcoci, **L. Majercsik**, A.D. Matei, *Culegere de probleme de analiză vol. II – Calcul integral*, Editura Conspress, ISBN 978-973-100-436-5, 2017
7. G. Păltineanu, M.Jianu, **L. Majercsik**, A.N. Marcoci, A.D. Matei, *Culegere de probleme de analiză matematică vol. I – Calcul diferențial*, Editura Conspress, ISBN 978-973-100-408-2, 978-973-100-409-9, 2016
8. **E. Ciurea**, *Algoritmica grafurilor*, Editura Universității Transilvania din Brașov, 2008
9. P. Matei, **L. Carabaneanu (Majercsik)**, A.N. Marcoci, A.D. Matei, *Probleme de ecuații diferențiale, ecuații cu derivate parțiale, calcul variațional și teoria probabilităților*, Editura Conspress, ISBN 978-973-100-026-7, 2008
10. **L. Ciupală**, *Algoritmi fundamentali din teoria grafurilor. Aplicații*, Editura Universității Transilvania, 2007
11. **E. Ciurea**, **L. Ciupală**, *Algoritmi. Introducere în algoritmica fluxurilor în rețele*, Editura MatrixRom, București, 2006

Proiecte de cercetare

1. **L. Majercsik** (membru), AI4AGRI – *Romanian Excellence Center on Artificial Intelligence on earth observation data for AGRIculture*, project ID:101079139, 2022-2025
2. **A.M. Deaconu** (coordonator UniTBv), Sfera III, Horizon 2020, *MPPT for PVs based on metaheuristic algorithm under concentrated light*, 25000 Euro, 2022-2023
3. **L. Majercsik** (membru), COST CA18232, *Mathematical models for interacting dynamics on Networks*, Institutul de Mecanica Solidelor, 2019-2020
4. **L. Majercsik** (membru), IMPROVE - Proiect PN-III-P1-1.2-PCCDI-2017-0221, *Control hibrid logic diferențial destinat sistemului robotic pentru tratamentul intraoperator al tumorilor hepatice nerezecabile*, 460000 lei, 2018-2021
5. **A.M. Deaconu** (membru), E-FARM 22134/2008, *Information support system for design, implementation and control of hybrid energy plants*, 110000 Euro, 2009-2011
6. **A.M. Deaconu** (membru), IDEI 134/2007, *Surse Regenerabile și Rețele Inteligente Distribuite de Energie*, 190000 Euro, 2007-2010

7. **L. Majercsik** (membru), TARD, *Dezvoltarea si testarea unui sistem automat de analiza a riscului, diagnoza si decizie pentru asistarea actului medical – proiect pilot*, Buget de Stat – MEC, Programul Cercetare de excelență, coordonator al proiectului: Academia de Studii Economice, 2005-2008