

Emrullah SONUÇ, Ph.D.

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Education:

- Feb.2012 - Jul.2017 Karabuk University, Karabük, Türkiye
Ph.D. in Computer Engineering, CGPA 3.65
Thesis Title: Parallelization of Simulated Annealing Algorithm on Graphics Processing Unit.
- Feb.2010 - Feb.2012 Karabuk University, Karabük, Türkiye
M.Sc. in Computer Engineering, CGPA 3.57
Thesis Title: Verification Of Regcm4 Regional Climate Model Data.
- Sep.2006 - Jun.2008 Selcuk University, Konya, Türkiye (Undergraduate transfer)
B.S. in Computer Engineering, CGPA 3.01
- Sep.2004 - Jun.2006 European University of Lefke, Lefke, TRNC
B.S. in Computer Engineering, CGPA 3.58
- Sep.1996 - Jun.2003 Karabük Anatolian İmam-Hatip High School, Karabük, Türkiye

Research Interests:

Evolutionary Computation
Meta-heuristics
Combinatorial Optimization
High Performance Computing
Machine Learning

Teaching Interests:

Theory of Computation
Digital Logic Circuits and Design
Database Systems
Operating Systems
Web Services

Academic History:

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|-----------------------|--|
| Mar. 2024– Now | Assoc. Prof., Department of Computer Engineering, Karabuk University |
| Oct. 2022 – Now | Research Associate, School of Computer Science (COL Lab), University of Nottingham |
| Oct. 2022 – Mar. 2024 | Assist. Prof., Department of Computer Engineering, Karabuk University |
| Oct. 2021– Oct.2022 | Postdoctoral Researcher (Funded By TÜBİTAK), School of Computer Science (COL Lab), University of Nottingham Assist. Prof., Department of Computer Engineering, Karabuk University |
| Nov. 2017 – Oct. 2021 | Assist. Prof., Department of Computer Engineering, Karabuk University |
| Oct. 2009 – Nov. 2017 | Research Assistant, Department of Computer Engineering, Karabuk University |

Skills:

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| Spoken Languages: | Intermediate English, native Turkish speaker. |
| Programming: | C, C++, Java, PHP, Python, CUDA, JavaScript, ... |
| Operating Systems: | Variis Distributions of Linux, Windows, Android. |
| Distributed Computing: | OpenMP, OpenMPI. |
| Database Administration: | MySQL, PostgreSQL, MariaDB, ... |

International Journal Publications:

1. Jumaili, M. L. F., **Sonuç, E.**, “An Attention-Based CNN Framework for Alzheimer’s Disease Staging with Multi-Technique XAI Visualization”, Computers, Materials and Continua, 83(2), 2947-2969, 2025.
2. Jumaili, M. L. F., **Sonuç, E.**, “ML-Driven Alzheimer’s disease prediction: A deep ensemble modeling approach”, SLAS technology, 100298, 2025.
3. **Sonuç, E.**, Özcan, E., “Parallel late acceptance hill-climbing for binary-encoded optimization problems”, An International Journal of Optimization and Control: Theories & Applications, 15(2), 311-329, 2025.
4. Kısaboyun, S., **Sonuç, E.**, “A Hybrid Genetic Algorithm and Simulated Annealing Approach for the Uncapacitated Facility Location Problem”, Computer and Decision Making: An International Journal, 2, 546-557, 2025.
5. **Sonuç, E.**, Özcan, E., “CUDA-based parallel local search for the set-union knapsack problem”, Knowledge-Based Systems, 112095, 2024.

6. Saihood, Q., **Sonuç, E.**, "A practical framework for early detection of diabetes using ensemble machine learning models", Turkish Journal of Electrical Engineering and Computer Sciences, 31(4), 722-738, 2023.
7. **Sonuç, E.**, Özcan, E., "An adaptive parallel evolutionary algorithm for solving the uncapacitated facility location problem", Expert Systems with Applications, 119956, 2023.
8. **Sonuç, E.**, "A novel binary crow search algorithm for the uncapacitated facility location problem", Neural Computing and Applications, 33, 14669–14685, 2021.
9. **Sonuç, E.**, "A modified crow search algorithm for the weapon-target assignment problem", An International Journal of Optimization and Control: Theories & Applications (IJOCTA), 10(2), 188-197, 2020.
10. **Sonuç, E.**, Sen, B., Bayir, S., "A cooperative GPU-based Parallel Multistart Simulated Annealing algorithm for Quadratic Assignment Problem", Engineering Science and Technology, an International Journal, 21 (5), 843-849, 2018.
11. **Sonuç, E.**, Sen, B., Bayir, S., "A Parallel Simulated Annealing Algorithm for Weapon-Target Assignment Problem", International Journal of Advanced Computer Science and Applications, 8 (4): 87-92, 2017.
12. **Sonuç, E.**, Sen, B., Bayir, S., "Solving Bin Packing Problem using Simulated Annealing", International Journal of Mechanical and Production Engineering (IJMPE), 5 (3): 21-23, 2017.
13. **Sonuç, E.**, Sen, B., Bayir, S., "A Parallel Approach for Solving 0/1 Knapsack Problem using Simulated Annealing Algorithm on CUDA Platform", International Journal of Computer Science and Information Security, 14 (12): 1096-1101, 2016.
14. Sen B., Kilinc R., Sen B., **Sonuç E.**, "Validation of a daily precipitation estimates of the regional climate model RegCM4 over the domains in Turkey with NWP verification techniques", Fresenius Environmental Bulletin, Parlar Scientific Publications, 2014.

International Conference/Workshop Publications:

1. Hashim, S. M., **Sonuç E.**, Karaoglan, K. M. "Performance Analysis of Simulated Annealing on the 0-1 Knapsack Problem". IEEE 9th International Conference on Engineering Technologies and Applied Sciences (ICETAS), 1-5, 2024.
2. Karaca, H., **Sonuç E.**, Atasoy, N. A. "Performance Analysis of Particle Swarm Optimization Algorithm with Bit-Flip Operator for 0-1 Knapsack Problem". 3rd International Congress of Electrical and Computer Engineering. (ICECENG), 355-370, 2024.
3. Akdağ Ş., **Sonuç E.**, Özcan C. "A Hybrid Ant Colony Optimization and Simulated Annealing for the Static Weapon-Target Assignment Problem", 3rd International Conference on Recent Academic Studies, 86-96, 2024.

4. Meşeci E., **Sonuç E.**, Özcan C. “Ensemble Approach with Multi-Agent and Swarm Based Algorithms in Quadratic Assignment Problem”, 2nd International Conference on Trends in Advanced Research, 677-687, 2024.
5. Akyıldız B., **Sonuç E.**, Özcan C. “Optimizing Uncapacitated Facility Locations Problem: A Hybrid Approach with Genetic Algorithms and Tabu Search”, 2nd International Conference on Trends in Advanced Research, 1-12, 2024.
6. Farzaliyev E., Saihood Q., **Sonuç E.** “Çocuklarda Anemi Hastalığının Teşhisinde Topluluk Öğrenme Yöntemlerinin Kullanılması”, International Conference on Recent Academic Studies (Vol. 1, pp. 129-135), 2023.
7. Saihood Q., **Sonuç E.** “The Efficiency of Classification Techniques in Predicting Anemia Among Children: A Comparative Study”, International Conference on Emerging Technology Trends in Internet of Things and Computing (pp. 167-181). Springer, Cham., 2022.
8. Ahmed, S. R., **Sonuç E.**, Ahmed, M. R., Duru, A. D. “Analysis Survey on Deepfake detection and Recognition with Convolutional Neural Networks.”, International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA). IEEE, 2022.
9. Salman K., **Sonuç E.** “Thyroid Disease Classification Using Machine Learning Algorithms”, 2nd International Conference on Physics and Applied Sciences (ICPAS), 2021.
10. Özcan E., **Sonuç E.** “Predicting the Amount of Materials Used for Desulphurization Process using Machine Learning”, 1st International Conference on Electrical-Electronics and Computer Engineering (ICEECE), 2021, Trabzon-Türkiye
11. Aswad S.A., **Sonuç E.** “Classification of VPN Network Traffic Flow Using Time Related Features on Apache Spark”, 4th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), IEEE, 2020.
12. **Sonuç E.**, Dönmez H. “Binary optimization using duelist optimization algorithm for One Max Problem”, 3rd International Conference on Advanced Technologies, Computer Engineering and Science (ICATCES20), June 3-5, 2020, Karabük - TURKEY.
13. **Sonuç E.**, “An Improved Crow Search Algorithm for Continuous Optimization Problems”, 2nd International Conference on Advanced Technologies, Computer Engineering and Science (ICATCES19), Apr 26-28, 2019, Alanya - TURKEY.
14. **Sonuç E.**, “Artificial Bee Colony Algorithm for The Linear Ordering Problem”, International Conference on Advanced Technologies, Computer Engineering and Science (ICATCES18), May 11-13, 2018, Safranbolu – TURKEY.
15. **Sonuç E.**, Sen B., Bayir S., “Comparison of Neighborhood Search Techniques for Solving Weapon-Target Assignment Problem using Simulated Annealing Algorithm”, International Conference on Mathematics and Engineering (ICOME), 10-12 May 2017, Istanbul – TURKEY.

16. **Sonuç E.**, “An Efficient Heuristic for Subset Sum Problem”, International Conference on Mathematics and Engineering (ICOME), 10-12 May 2017, Istanbul – TURKEY.
17. **Sonuç E.**, Sen B., Bayir S., “Solving Bin Packing Problem using Simulated Annealing”, Proceedings of 65th ISERD International Conference, Mecca, Saudi Arabia, 23rd -24th January 2017, ISBN: 978-93-86291-92-96th.
18. Sen B., Sen B., **Sonuç E.**, Topcu S., Krichak S.O., Kilinc R., “Assessing the capturing capacity of RegCM4 for the precipitation over Med-CORDEX using boundary data with higher resolution and improved accuracy”, 6th ICTP Workshop on The Theory and Use Of Regional Climate Models, 7-18 May 2012, Trieste – ITALY.
19. **Sonuç E.**, Sen Ba., Sen Bu., “Verifying Regional Climate Model Results with Web-Based Expert-System”, 1st World Conference on Innovation and Software Development Bahcesehir University, 02-04 September 2011, Istanbul – TURKEY.
20. Menemencioglu O., Sen B., Atasoy F., **Sonuç E.**, “LMS (Moodle) Automatic Enrollment Approach by Flat File with Student Information System Data”, 2nd World Conference On Information Technology, 22-27 November 2011, Antalya – TURKEY.

National Journal Publications:

1. Özcan, E., **Sonuç E.**, “Makine Öğrenme Teknikleri Kullanılarak Kükürt Giderme İşleminde Kullanılan Malzeme Miktarının Tahmini”, Zeki Sistemler Teori ve Uygulamaları, 5(1), 57-63, 2022.
2. Demirel, O., **Sonuç E.**, “Yapay Zeka Teknikleri Kullanılarak Kemik Yaşı Tespiti”, Türkiye Sağlık Enstitüleri Başkanlığı Dergisi, 4(3), 17-30, 2021.

National Conference Publications:

1. **Sonuç E.**, Sen B., Bayir S., “Simulated Annealing Method for Solving Traveling Salesman Problem Using Parallel Computing, Akademik Bilişim 2015, 04-06 Şubat 2015, Eskişehir.
2. **Sonuç E.**, ORTAKCI Y., ELEN A., “Android Application of Karabuk University Information System”, Akademik Bilişim 2013, 23-25 January 2013, Antalya – TURKEY
3. Menemencioglu O., **Sonuç E.**, Karas I.R., Orak I.M., “Academic Curriculum Vitae Based Faculty Information System”, Akademik Bilişim 2013, 23-25 January 2013, Antalya – TURKEY.
4. Sen B., Kilinc R., Sen B., **Sonuç E.**, “RegCM4 Climate Model Precipitation Verification For Niğde Region”, 2-4 October 2013, İç Anadolu Bölgesi 1. Tarım ve Gıda Kongresi, Niğde-TURKEY.

Projects:

1. Researcher, Karabuk University, SRCU, Project Number: KBÜ-BAP-15/2-DR-027, Project Name: “Parallelization of Simulated Annealing Algorithm on Graphics Processing Unit and Its Implementation on NP-hard Problems”, 2017

2. Assistant Personnel, (National) Industrial Theses Program (SAN-TEZ), Yıldırım Beyazıt University, Project Number: 1318.STZ.2012-1, Project Name: “e-Triage Decision Support System Software”, 2012-2014
3. Researcher, Karabuk University, SRCU, Project Number: KBÜ-BAP-C-11-Y-016, Project Name: “Verification of Regcm4 Regional Climate Model Data”, 2011

Academic Service:

Assistant Editor-in-Chief: Engineering Science and Technology, an International Journal (JESTECH, Q1), Elsevier

Reviewer: Swarm and Evolutionary Computation (Elsevier), Engineering Applications of Artificial Intelligence (Elsevier), Expert Systems with Applications (Elsevier), Applied Soft Computing (Elsevier), Computers & Industrial Engineering (Elsevier), Information Sciences (Elsevier), Parallel Computing (Elsevier), Biomedical Signal Processing & Control (Elsevier), Information Fusion (Elsevier), Turkish Journal of Electrical Engineering and Computer Sciences (TÜBİTAK) , Journal of Big Data (Springer), The Journal of Supercomputing (Springer), Multimedia Tools and Applications (Springer), Cluster Computing (Springer), Imaging Science Journal (Taylor & Francis), Computational Intelligence and Neuroscience (Wiley), Journal of Aerospace Information Systems, Applied Sciences, Pamukkale University Journal of Engineering Sciences, Akademik Bilişim Conferences.