Prof.Didem Gözüpek

Gebze Technical University
Dept. of Computer Engineering
Office: 237 41400 Gebze
Kocaeli, Turkey

Phone: (+90)262-605-2217
E-mail: didem.gozupek AT gtu.edu.tr
Website: http://bilmuh.gtu.edu.tr/~dgozupek
Lab: http://bilmuh.gtu.edu.tr/granet/

RESEARCH INTERESTS

Structural and algorithmic graph theory, approximation algorithms, optimization problems in communication networks

EDUCATION

Boğaziçi University, Istanbul, Turkey

PhD, Computer Engineering $(2008 - 2012)$

New Jersey Institute of Technology, NJ, USA

MS, Electrical and Computer Engineering $(2004 - 2005)$

Sabancı University, Istanbul, Turkey

BS, Telecommunications Engineering $(1999 - 2004)$

Izmir Science High School (Izmir Fen Lisesi), Izmir, Turkey

High School Diploma $(1996 - 1999)$

PUBLICATIONS

Journals (SCI/SCI-E)

- Y.Büyükçolak, D.Gözüpek, S.Özkan, "Well-indumatched pseudoforests", accepted to *Discrete Applied Mathematics*, 2024.
- Y.Büyükçolak, D.Gözüpek, S.Özkan, "Equimatchable bipartite graphs", *Discussiones Mathematicae Graph Theory*, vol.43, no.1, 2023.
- M.Detlaff, D.Gözüpek, J.Raczek, "Paired domination versus domination and packing number in graphs", accepted to *Journal of Combinatorial Optimization*, vol.44, no.2, pp.921-933, 2022.
- Y.Büyükçolak, D.Gözüpek, S.Özkan, "Triangle-free equimatchable graphs", *Journal of Graph Theory*, vol.99, no.3, pp.461-484, 2022.
- H.Alizadeh, G.Boruzanlı-Ekinci, D.Gözüpek, "(C_3, C_4, C_5, C_7)-free almost well-dominated graphs", *Discussiones Mathematicae Graph Theory*, vol.42, no.4, pp.1099-1117, 2022.
- H.Alizadeh, D.Gözüpek, "Upper paired domination versus upper domination", *Discrete Mathematics and Theoretical Computer Science*, vol.23, 2021.
- S.Bahadır, D.Gözüpek, O.Doğan, "On graphs all of whose total dominating sequences have the same length", *Discrete Mathematics*, vol.344, no.9, 2021.
- S.Bahadır, T.Ekim, D.Gözüpek, "Well-totally-dominated graphs", *Ars Mathematica Contemporanea*, vol.20, no.2, 2021.
- J.Baste, D.Gözüpek, M.Shalom, D.M.Thilikos, "Minimum reload cost graph factors", *Theory of Computing Systems*, vol.65, no.5, pp.815-838, 2021.
- H.Alizadeh, D.Gözüpek, "Almost well-dominated bipartite graphs with minimum degree at least two", *RAIRO-Operations Research*, vol.55, pp.1633-1646, 2021.
- H.Alizadeh, D.Gözüpek, "Signaling cost-aware routing for green networks", *IET Communications*, vol.14, no.14, 2020.
- T.Ekim, D.Gözüpek, A.Hujdurović, M.Milanič, "Mind the independence gap" *Discrete Mathematics*, vol.343, no.9, 2020.
- J.Baste, D.Gözüpek, C.Paul, I.Sau, D.M.Thilikos, "Parameterized complexity of finding a spanning tree with minimum reload cost diameter", *Networks*, vol.75, no.3, pp.259-277, 2020.

- S.Demirci, D.Gözüpek, "Switching cost-aware joint frequency assignment and scheduling for industrial cognitive radio networks", *IEEE Transactions on Industrial Informatics*, vol.16, no.7,pp.4365-4377, 2019.
- U.Odabaşı, H.Alizadeh, D.Gözüpek, "Energy-fair and flexible bandwidth-based routing in multi-domain green networks", *IET Communications*, vol.13, no.18, pp.3052-3058, 2019.
- Y.Büyükçolak, D.Gözüpek, S.Özkan, "Minimum reload cost cycle cover in complete graphs", *Networks*, vol.74, no.3, pp.274-286, 2019.
- M.H.Dahir, H.Alizadeh, D.Gözüpek, "Energy efficient virtual network embedding for federated software defined networks", *International Journal of Communication Systems*, vol.32, no.6, 2019.
- D.Gözüpek, M.Shalom, "Complexity of edge coloring with minimum reload/changeover costs", *Networks*, vol.73, no.3, pp.344-357, 2019.
- Y.Büyükçolak, D.Gözüpek, S.Özkan, M.Shalom, "On one extension of Dirac's theorem on Hamiltonicity", *Discrete Applied Mathematics*, vol.252, pp.10-16, 2019.
- T.Ekim, D.Gözüpek, A.Hujdurović, M.Milanič, "On almost well-covered graphs of girth at least 6", *Discrete Mathematics and Theoretical Computer Science*, vol.20, 2018.
- S.Akbari, H.Alizadeh, T.Ekim, D.Gözüpek, M.Shalom, "Equimatchable claw-free graphs", *Discrete Mathematics*, vol.341, no.10, pp.2859-2871, 2018.
- S.Bahadır, D.Gözüpek, "On a class of graphs with large total domination number", *Discrete Mathematics and Theoretical Computer Science*, vol.20, no.1, 2018.
- D.Gözüpek, A.Hujdurović, M.Milanič, "Characterizations of minimal dominating sets and the well-dominated property in lexicographic product graphs", *Discrete Mathematics and Theoretical Computer Science*, vol.19, no.1, 2017.
- Ş.Batı, D.Gözüpek, "Joint optimization of cash management and routing for new-generation automated teller machine networks", *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol.49, no.12, pp.2724-2738, 2017.
- D.Gözüpek, S.Özkan, C.Paul, I.Sau, M.Shalom, "Parameterized complexity of the MINCCA problem on graphs of bounded decomposability", *Theoretical Computer Science*, vol.690, pp.91-103, 2017.
- N.Chiarelli, C.Dibek, T.Ekim, D.Gözüpek, S.Miklavic, "On matching extendability of lexicographic products", *RAIRO-Operations Research*, vol.51, no.3, pp.857-873, 2017.
- C.Beşiktaş, D.Gözüpek, A.Ulaş, E.Lokman, "Secure virtual network embedding with flexible bandwidth-based revenue maximization", *Computer Networks*, vol.121, pp.89-99, 2017.
- M.F.Tüysüz, Z.K.Ankaralı, D.Gözüpek, "A survey on energy efficiency in software defined networks", *Computer Networks*, vol.113, pp.188-204, 2017.
- C.Dibek, T.Ekim, D.Gözüpek, M.Shalom, "Equimatchable graphs are C_{2k+1}-free for $k \geq 4$", *Discrete Mathematics*, vol.339, no.12, pp.2964-2969, 2016.
- D.Gözüpek, H.Shachnai, M.Shalom, S.Zaks, "Constructing minimum changeover cost arborescences in bounded treewidth graphs", *Theoretical Computer Science*, vol.621, pp.22-36, 2016.
- F.Ekici, D.Gözüpek "Joint overlay routing and relay assignment for green networks", *Computer Networks*, vol.79, pp.323-344, 2015.
- D.Gözüpek, M.Shalom, F.Alagöz, "A graph-theoretic approach to scheduling in cognitive radio networks", *IEEE/ACM Transactions on Networking*, vol.23, no.1, pp.317-328, 2015.
- D.Gözüpek, M.Shalom, A.Voloshin, S.Zaks "On the complexity of constructing minimum changeover cost arborescences", *Theoretical Computer Science*, vol.540-541, pp.40-52, 2014.
- D.Gözüpek, S.Buhari, F.Alagöz, "A spectrum switching delay-aware scheduling algorithm for centralized cognitive radio networks", *IEEE Transactions on Mobile Computing*, vol.12, no.7, pp.1270-1280, 2013.
- D.Gözüpek, B.Eraslan, F.Alagöz, "Throughput satisfaction-based scheduling for cognitive radio networks", *IEEE Transactions on Vehicular Technology*, vol.61, no.9, pp.4079-4094, 2012.
- B.Eraslan, D.Gözüpek, F.Alagöz, "An auction theory-based algorithm for throughput maximizing scheduling in centralized cognitive radio networks", *IEEE Communications Letters*, vol.15, no.7, pp.734-736, 2011.
- D.Gözüpek, F.Alagöz, "Genetic algorithm-based scheduling in cognitive radio networks under interference temperature constraints", *Wiley's International Journal of Communication Systems (IJCS)*, vol.24, no.2, pp.239-257, 2011.

- D.Gözüpek, F.Alagöz, "Throughput and delay optimal scheduling in cognitive radio networks under interference temperature constraints", *Journal of Communications and Networks (JCN)*, vol.11, no.2, pp.147-155, 2009.
- D.Gözüpek, S.Papavassiliou, N.Ansari, "Enhancing quality of service provisioning in wireless ad hoc networks using service vector paradigm", *Wiley Journal on Wireless Communications and Mobile Computing (WCMC)*, vol.6, no.7, pp.1003-1015, 2006.

Technical Reports

- D.Gözüpek, F.Alagöz, "A fair scheduling model for centralized cognitive radio networks", arXiv preprint:1309.2233, 2013. Available: http://arxiv.org/pdf/1309.2233v1.pdf

Book Chapters

- D.Gözüpek, F.Alagöz, "An opportunistic pervasive networking paradigm: Multi-hop cognitive radio networks", Chapter 7 in *Pervasive Computing and Networking*, John Wiley & Sons, Ltd., UK, 2011.

International Conferences

- J.Baste, D.Gözüpek, C.Paul, I.Sau, M.Shalom, D.M.Thilikos, "Parameterized complexity of finding a spanning tree with minimum reload cost diameter", accepted to *International Symposium on Parameterized and Exact Computation (IPEC)*, Vienna, Austria, 2017.
- D.Gözüpek, S.Özkan, C.Paul, I.Sau, M.Shalom, "Parameterized complexity of the MINCCA problem on graphs of bounded decomposability", accepted to *International Workshop on Graph-Theoretic Concepts in Computer Science (WG)*, Istanbul, Turkey, 2016.
- C.Besiktas, D.Gözüpek, A.Ulas, E.Lokman, Ö.Özyurt, K.Ulusoy, "Flexible bandwidth-based virtual network embedding", accepted to *IEEE Network Operations and Management Symposium (NOMS)*, Istanbul, Turkey, 2016.
- N.T.Altan Akin, D.Gözüpek, "Energy-fair routing in multi-domain green networks", *International Conference on Software, Telecommunications and Computer Networks (SoftCOM)*, Split-Bol (Island of Brac), Croatia, 2015.
- H.Alizadeh, D.Gözüpek, S.Buhari, A.Yayimli, "Minimizing signaling cost in green routing for software defined networks", *IEEE Symposium on Computers and Communications (ISCC)*, Larnaca, Cyprus, 2015.
- D.Gözüpek, M.Shalom, "Edge coloring with minimum reload/changeover costs", *Algorithmic Graph Theory on the Adriatic Coast (AGTAC)*, Koper, Slovenia, 2015.
- C.Dibek, T.Ekim, D.Gözüpek, M.Shalom, "Equimatchable graphs are C_{2k+1}-free for $k \geq 4$", 13th *Cologne-Twente Workshop on Graphs and Combinatorial Optimization*, Istanbul, Turkey, 2015.
- D.Gözüpek, H.Shachnai, M.Shalom, S.Zaks, "Constructing minimum changeover cost arborescences in bounded treewidth graphs", 13th *Cologne-Twente Workshop on Graphs and Combinatorial Optimization*, Istanbul, Turkey, 2015.
- D.Gözüpek, M.Shalom, "Edge coloring with minimum reload/changeover costs", 13th *Cologne-Twente Workshop on Graphs and Combinatorial Optimization*, Istanbul, Turkey, 2015.
- Y.Büyükçolak, D.Gözüpek, S.Özkan, "Extension of Dirac theorem on Hamiltonicity", 13th *Cologne-Twente Workshop on Graphs and Combinatorial Optimization*, Istanbul, Turkey, 2015.
- M.Çamurli, D.Gözüpek, "Channel switching cost-aware resource allocation for multi-hop cognitive radio networks with a single transceiver", *International Conference on Ad hoc Networks (ADHOCNETS)*, 2014.
- M.R.Çelenlioğlu, D.Gözüpek, H.A.Mantar, "A survey on the energy efficiency of vertical handover mechanisms", International Conference on Wireless and Mobile Networks (WiMoN), Istanbul, Turkey, 2013.
- D.Gözüpek, M.Shalom, A.Voloshin, S.Zaks, "On the complexity of constructing minimum reload cost path-trees", *International Symposium on Combinatorial Optimization (ISCO)*, Athens, Greece, 2012.

- D.Gözüpek, F.Alagöz, "An interference aware throughput maximizing scheduler for centralized cognitive radio networks", *IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC'10)*, Istanbul, 2010.
- D.Gözüpek, G.Genç, C.Ersoy, "Channel assignment problem in cellular networks: A reactive tabu search approach", *IEEE International Symposium on Computer and Information Sciences (ISCIS'09)*, Northern Cyprus, 2009.
- D.Gözüpek, F.Alagöz, "Scheduling in cognitive radio networks", *Google Anita Borg Meeting*, Zürich, Switzerland, 2009.
- D.Gözüpek, S.Bayhan, F.Alagöz, "A novel handover protocol to prevent hidden node problem in satellite assisted cognitive radio networks", *IEEE International Symposium on Wireless Pervasive Computing (ISWPC'08)*, pp.693 − 696, Santorini, Greece, 2008.
- D.Gözüpek, A.Sever, "Service concentration node in IMS", *Lecture Notes in Computer Science (LNCS), International Conference on Next Generation Teletraffic and Wired/Wireless Advanced Networking (NEW2AN'08)*, vol.5174, pp.169 − 176, St.Petersburg, Russia, 2008.
- D.Gözüpek, S.Papavassiliou, N.Ansari, J.Yang, "A power efficient qos provisioning architecture for wireless ad hoc networks", *IEEE International Conference on Communications (ICC'06)*, vol.8, pp.3873 − 3878, Istanbul, 2006.
- D.Gözüpek, S.Papavassiliou, N.Ansari, "A cross-layer architecture for end-to-end qos provisioning in wireless ad hoc networks", *International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP'06)*, Patras, Greece, 2006.

Awards and Accomplishments

- Research Encouragement Award, METU-Prof.Dr.Mustafa Parlar Foundation (2019)
- Young Scientist (BAGEP) Award, Science Academy, Turkey (2019)
- CAREER Award, Scientific and Technological Research Council of Turkey (TUBITAK) (2014)
- Dr.Serhat Özyar Young Scientist of the Year Honorary Award (2013)
- PhD Thesis Award, BAP, Bogazici University (2012)
- ASELSAN PhD Fellowship (2011)
- Finalist for Google Anita Borg Memorial Scholarship in the EMENA region (4/2009)
- TUBITAK national PhD scholarship (2010)
- TUBITAK international research scholarship (2011)
- Marquis Who's Who in the World (2010)
- *Research Assistantship* covering full tuition and stipend, NJIT, USA (2004 − 2005)
- Graduated with *High Honors* and ranked 5th in Telecommunications Engineering, Sabancý University (2004)
- *Merit Scholarship*, covering full tuition and accommodation, Sabancý University (1999 − 2004)
- Ranked in the top 0.03% in the central nationwide university entrance exams (1999)

Funded Projects

- Group Leader of the Coordinating Institution, "(C)ombinatorial (O)ptimization for (V)ersatile applications to (E)merging u(R)ban problems", Horizon MSCA Staff Exchanges HORIZON-MSCA-2023-SE-01, funded by European Commission, Project No: 101182819, 2025-2028.
- Principal Investigator, "Criticality in packing coloring of graphs", funded by TUBITAK (1001 Program), Project No: 124F114, 2024-2027.
- Principal Investigator, "Domination and total domination in graphs", funded by TUBITAK (1001 Program), Project No: 118E799, 2019-2021.
- Principal Investigator, "Reload cost concept in graph theory: A combinatorial analysis", funded by TUBITAK-CNRS, Turkey-France Bilateral Research Project No: 114E731, 2015-2017
- Principal Investigator, "Fairness and energy efficiency in resource management for federated software defined networks", funded by TUBITAK (1001 Program), Project No: 114E245, 2014-2017
- Principal Investigator, "Resource allocation and routing for green networks", CAREER Project, funded by TUBITAK, Project No: 113E567, 2014-2017
- Principal Investigator, "A software defined networking approach to resource management in virtual networks", University-Industry Collaboration Project, funded by Argela Technologies, 2014-2015

- Principal Investigator, "Energy-fair routing in green multi-domain networks", funded by Scientific Research Projects Office of Gebze Technical University (GTU BAP), Project No: 2014 A27, 2014-2016
- Principal Investigator, "Minimum changeover cost graph problems", funded by Scientific Research Projects Office of Gebze Technical University (GTU BAP), Project No: 2013 A24, 2013-2015
- Researcher, "New trends in matching theory", funded by TUBITAK-ARRS, Turkey-Slovenia Bilateral Research Project No: 213M620, 2014-2017
- Collaborator, "SINCERE: Scheduling in infrastructure-based cognitive radio networks", 1001 Project, funded by TUBITAK, Project No: 109E256, 2009-2012
- Collaborator, "Scheduling in cognitive radio networks", funded Scientific Research Projects Office of Bogazici University (BAP), Project No: 09A108P, 2009-2010

PROFESSIONAL EXPERIENCE

Professor

Computer Engineering Department, Gebze Technical University, Kocaeli, Turkey (4/2022-Present)

Associate Professor

Computer Engineering Department, Gebze Technical University, Kocaeli, Turkey (4/2016-4/2022)

Assistant Professor

Computer Engineering Department, Gebze Technical University, Kocaeli, Turkey (8/2012-4/2016)

Director

Graph Theory & Network Optimization Research Laboratory
Computer Engineering Department, Gebze Technical University

Researcher

Telematics Research Center and Computer Networks Research Laboratory
Computer Engineering, Boğaziçi University (2008-2012)
- Supported by the State Planning Organization of Turkey (DPT)

R&D Engineer

Argela Technologies, Turkish Telecom, Istanbul (2005 − 2008)

Research Assistant

Electrical and Computer Engineering
New Jersey Institute of Technology (NJIT), USA (2004 − 2005)
- Supported by the National Science Foundation (NSF)

SUPERVISED STUDENTS
- Selim Bahadır, "New aspects of total domination in graphs" (Postdoc)
- Oğuz Doğan, "Dominating sequences in graphs" (Postdoc)
- Yasemin Büyükçolak, PhD Thesis title: "On equimatchable and well-covered graphs", 2022
- Hadi Alizadeh, PhD Thesis title: "New structural aspects of domination and independence in graph theory", 2021
- Sercan Demirci, PhD Thesis title: "Frequency switching cost-aware resource allocation and routing in cognitive radio networks", 2018.
- Şeyma Batı, MS Thesis title: "Joint optimization of cash management and routing for new generation automated teller machine networks", 2016

- Hadi Alizadeh, MS Thesis title: "Minimizing signaling cost in green routing for software defined networks", 2015
- Fatma Ekici, MS Thesis title: "Joint overlay routing and relay assignment for green networks", 2014
- Başak Eraslan, MS Thesis title: "Heuristic algorithms for scheduling in cognitive radio networks", 2011
- Mohamed Haji Dahir, MS Thesis title: "Virtual network assignment in federated software defined networks", 2018
- Mustafa Çamurli, MS Thesis title: "Energy-efficient resource allocation in cognitive radio networks", 2018

TEACHING
EXPERIENCE

- CSE-622 Graph Algorithms and Applications (Spring 2016-Spring 2024)
- CSE-719 Special Topics in Computer Engineering (Fall 2015)
- CSE-721 Special Topics in Algorithms (Spring 2014, Spring 2015, Fall 2016-Fall 2024)
- CSE-321 Introduction to Algorithm Design (Fall 2014-Fall 2024)
- CSE-521 Algorithm Analysis and Design (Spring 2013, Spring 2023-2024)
- CSE-444 Software Engineering-II (Spring 2014-Spring 2017)
- CSE-443 Object Oriented Analysis and Design (Spring 2013, Fall 2013-Fall 2015)
- CSE-211 Discrete Mathematics (Fall 2012)
- CSE-574 Design and Analysis of TCP/IP Networks (Fall 2012, Fall 2014)
- CMPE 581 Communications Engineering for Mobile/Wireless Networks, Fall 2010-2011 (Co-lectured)
- CMPE 300 Analysis of Algorithms, Summer 2011 (Co-lectured)

LANGUAGE
SKILLS

- English (Advanced), German (Intermediate), Turkish (Native)

PROFESSIONAL
SERVICE

Editor

Journal of Circuits, Systems, and Computers (JCSC)

Turkish Journal of Electrical Engineering and Computer Sciences

TPC Member

IEEE Globecom'07, SPACOMM'09, RUSMART'09

Reviewer

Discrete Mathematics, Discrete Applied Mathematics, IEEE/ACM Transactions on Networking, IEEE Transactions on Wireless Communications, IEEE Transactions on Vehicular Technology, IEEE Communications Magazine, PIMRC'08, IWSSC'08, ICC'09, etc.

Organizing Committee Member

Co-organizer, Workshop on Graph Theory and Its Applications, Istanbul Center for Mathematical Sciences, 2016-2017.

Organizer, Departmental Research Seminars, Gebze Technical University Computer Engineering, 2017-2018

Posters Co-chair, IEEE Network Operations and Management Symposium (IEEE NOMS), Istanbul, 2016

Ismail Ari Computer Science and Engineering Summer School, Istanbul, 2015

International Symposium on Computer Networks (ISCN'08)