Asst. Prof. MURAT KARAKUŞ

Personal Information

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International Researcher IDs

ScholarID: fGkZEUsAAAAJ

ORCID: 0000-0002-8893-7345

Publons / Web Of Science ResearcherID: M-9156-2019

ScopusID: 54393351700

Yoksis Researcher ID: 299519

Education Information

Doctorate, Purdue University, School of Science, Computer & Information Science, United States Of America 2013 - 2018

Postgraduate, University of Michigan-Flint, College of Arts & Sciences, COMPUTER SCIENCE & INFORMATION SYSTEMS, United States Of America 2011 - 2013

Undergraduate, Suleyman Demirel University, Fen Edebiyat Fakültesi, Matematik Bölümü, Turkey 2005 - 2009

Biography

Murat Karakus received a B.S. degree in Mathematics from Suleyman Demirel University, Turkey, in 2009, and the M.S. degree in Computer Science and Information Systems from the University of Michigan-Flint, USA, in 2013, and the Ph.D. degree in the Computer Science from Purdue School of Science in Indianapolis, USA, in 2018. He is currently working as an Assistant Professor at Ankara University in Turkey. He is the recipient of the Best Paper Award at ACM SIGITE 2011 conference. He has 25+ peer-reviewed publications and serves as a reviewer for esteemed IEEE, ACM, and Elsevier journals and conferences. His current research interests include next-generation network architectures, such as Software-Defined Networking (SDN), Blockchain technology, network scalability, Quality of Service (QoS), routing, economic analysis of network architectures and designs, and pricing network services.

Foreign Languages

English, C2 Mastery

Dissertations

Doctorate, A Framework for Economic Analysis Network Architectures, Purdue University, School of Science, Computer & Information Science, 2018

Research Areas

Computer Sciences, Information Security and Reliability, Hiding Information, Information System Reliability, Computer Networks, Communications and Network Protocols, Data Routing, Engineering and Technology

Academic Titles / Tasks

Assistant Professor, Ankara University, Mühendislik Fakültesi, Yazılım Mühendisliği Bölümü, 2022 - Continues
Assistant Professor, Bayburt University, Vocational School, Department Of Computer Technologies, 2019 - 2022

Academic and Administrative Experience

Head of Department, Ankara University, Mühendislik Fakültesi, Yazılım Mühendisliği Bölümü, 2024 - 2027
Head of Department, Ankara University, Mühendislik Fakültesi, Yazılım Mühendisliği Bölümü, 2024 - 2027
Erasmus Program Institutional Coordinator, Bayburt University, Teknik Bilimler Meslek Yüksekokulu, Bilgisayar Teknolojileri Bölümü, 2021 - 2022
Assistant Manager of Research and Application Center, Bayburt University, Distant Education Application And Research Center, 2020 - 2022
Meslek Yüksekokulu Kurulu Üyesi, Bayburt University, Vocational School, 2019 - 2022
Meslek Yüksekokulu Yönetim Kurulu Üyesi, Bayburt University, Vocational School, 2019 - 2022
Meslek Yüksekokulu Akademik Kurul Üyesi, Bayburt University, Vocational School, 2019 - 2022
Head of Department, Bayburt University, Vocational School, Department Of Computer Technologies, 2019 - 2022

Courses

YMH218 Veri Yapıları, Undergraduate, 2023 - 2024
Blockchain Technology and Smart Contracts, Doctorate, 2023 - 2024, 2022 - 2023

Advising Theses

Karakuş M., Güler E., QUALITY OF SERVICE ASSISTED ROUTING ARCHITECTURE WITH DIGITAL WALLET TECHNOLOGIES USING A DIRECTED ACYCLIC GRAPH MODEL ROUTING IN SOFTWARE-DEFINED MULTI-DOMAIN NETWORKS, Postgraduate, C.Buse(Student), 2023
Karakuş M., Güler E., MACHINE LEARNING ENHANCED QUALITY OF SERVICE BASED ROUTING WITH BLOCKCHAIN IN MULTI-DOMAIN SOFTWARE DEFINED NETWORKS, Postgraduate, Z.Önder(Student), 2023

Taught Courses And Trainings

Karakuş M., Bilgi Sistem Subayı Temel Sertifika Programı, 2023 - 2024

Published journal articles indexed by SCI, SSCI, and AHCI

I. **GATE-BC: Genetic Algorithm-Powered QoS-Aware Cross-Network Traffic Engineering in Blockchain-Enabled SDN**
    KARAKUŞ M.
    IEEE Access, vol.12, pp.36523-36545, 2024 (SCI-Expanded)

II. **Smartcontractchain (SC2): Cross-ISP QoS traffic management framework with SDN and blockchain**
Karakuş M., Guler E., Uludag S.
Peer-to-Peer Networking and Applications, vol.16, no.6, pp.3003-3020, 2023 (SCI-Expanded)

III. **Blockchain-enhanced cross-ISP spectrum assignment framework in SDONs: SpectrumChain**
Guler E., KARAKUŞ M., Uludag S.
Computer Networks, vol.223, 2023 (SCI-Expanded)

IV. **Genetic algorithm enabled virtual multicast tree embedding in Software-Defined Networks**
Guler E., KARAKUŞ M., Ayaz F.
Journal of Network and Computer Applications, vol.209, 2023 (SCI-Expanded)

V. **A Promising Integration of SDN and Blockchain for IoT Networks: A Survey**
Turner S. W., KARAKUŞ M., Guler E., Uludag S.
IEEE ACCESS, vol.11, pp.29800-29822, 2023 (SCI-Expanded)

VI. **QoSChain: Provisioning Inter-AS QoS in Software-Defined Networks With Blockchain**
Karakus M., Guler E., Uludag S.
IEEE TRANSACTIONS ON NETWORK AND SERVICE MANAGEMENT, vol.18, no.2, pp.1706-1717, 2021 (SCI-Expanded)

VII. **An economic framework for analysis of network architectures: SDN and MPLS cases**
Karakus M., Durresi A.
JOURNAL OF NETWORK AND COMPUTER APPLICATIONS, vol.136, pp.132-146, 2019 (SCI-Expanded)

VIII. **Economic Viability of Software Defined Networking (SDN)**
Karakus M., Durresi A.
COMPUTER NETWORKS, vol.135, pp.81-95, 2018 (SCI-Expanded)

IX. **Quality of Service (QoS) in Software Defined Networking (SDN): A survey**
Karakus M., Durresi A.
JOURNAL OF NETWORK AND COMPUTER APPLICATIONS, vol.80, pp.200-218, 2017 (SCI-Expanded)

X. **A survey: Control plane scalability issues and approaches in Software-Defined Networking (SDN)**
Karakus M., Durresi A.
COMPUTER NETWORKS, vol.112, pp.279-293, 2017 (SCI-Expanded)

Articles Published in Other Journals

I. **Implementation of Blockchain-Assisted Source Routing for Traffic Management in Software-Defined Networks**
Karakuş M.
Düzce Üniversitesi Bilim ve Teknoloji Dergisi, vol.11, no.3, pp.1250-1268, 2023 (Peer-Reviewed Journal)

II. **An affordable virtual laboratory infrastructure to complement a variety of computing classes**
Uludag S., Karakuş M., Güler E., Turner S. W.
Journal of Computing Sciences in Colleges, vol.27, no.5, pp.158-166, 2012 (Peer-Reviewed Journal)

Books & Book Chapters

I. **BLOKZİNCİR VE SOSYAL AĞ PLATFORMLARININ KESİŞİMİ: LİTERATÜRE GENEL BİR BAKIŞ**
KARAKUŞ M., GÜLER E.
in: SOSYAL AĞ ANALİZİNDE YAPAY ZEKÂ YAKLAŞIMLARI, Parlar Tuba, Esen Fatih Sinan, Editor, Nobel Akademik Yayıncılık, Ankara, pp.91-109, 2023

II. **NESNELERİN İNTERNETİ (INTERNET OF THINGS)**
KARAKUŞ M., GÜLER E.
in: DİJİTAL GELECEK DİJİTAL DÖNÜŞÜM, ERDOĞAN TARAKÇI İNCİ, GÖKTAŞ BORA, Editor, EFE AKADEMİ YAYINEVİ, İstanbul, pp.332-363, 2021

III. **BLOKZİNCİRİ VE YAZILIM TANIMLI AĞLAR**
KARAKUŞ M.
in: SİBER GÜVENLİK VE SAVUNMA Blokzincir ve Kriptoloji, SAĞIROĞLU ŞEREF, AKLEYLEK SEDAT, Editor, Nobel
Akademik Yayıncılık, Ankara, pp.165-216, 2021

IV. **YAZILIM TANIMLI AĞLARDA MAKİNE ÖĞRENMESİ UYGULAMALARI**
GÜLER E., KARAKUŞ M.
in: BİLGİSAYAR BİLİMLERİNDE TEORİK VE UYGULAMALI ARAŞTIRMALAR, TALAN TARIK, AKTÜRK CEMAL, Editor,
EFE AKADEMİ, İstanbul, pp.271-296, 2021

V. **BULUT BİLİŞİMİN TEMELLERİ**
KARAKUŞ M., GÜLER E.
in: BİLGİSAYAR BİLİMLERİNDE TEORİK VE UYGULAMALI ARAŞTIRMALAR, TALAN TARIK, AKTÜRK CEMAL, Editor,
EFE AKADEMİ, İstanbul, pp.49-86, 2021

VI. **BİLGİSAYAR VE İLETİŞİM AĞLARI**
GÜLER E., KARAKUŞ M.
in: MÜHENDİSLİK ALANINDA Uluslararası Araştırmalar, AYDEMİR, EMRAH, Editor, EĞİTİM YAYINEVİ, Konya,
pp.179-211, 2021

Refereed Congress / Symposium Publications in Proceedings

I. **Yazılım Tanımlı Çoklu Ağlarda Makine Öğrenmesi ve Blokzinciri ile Geliştirilmiş Servis Kalitesi
Destekli Yönlendirme Mimarisi**
ÖNDER Z., AYAZ F., KARAKUŞ M., GÜLER E.
5. ULUSLARARASI UYGULAMALI BİLİMLER KONGRESİ 2023, Tunceli, Turkey, 11 June 2023, pp.134-148

II. **Yazılım Tanımlı Çoklu Ağlarda Yönlendirilmiş Döngüsüz Graf Modelli Dijital Cüzdan Teknolojileri ile
Servis Kalitesi Destekli Yönlendirme Mimarisi**
YILDIRIM C. B., AYAZ F., KARAKUŞ M., GÜLER E.
5. ULUSLARARASI UYGULAMALI BİLİMLER KONGRESİ 2023, Tunceli, Turkey, 9 - 11 June 2023, pp.157-167

III. **Particle Swarm Optimization-Enhanced Virtual Multicast Trees Embedding in SDNs**
GÜLER E., AYAZ F., KARAKUŞ M., HANBAY D.
2023 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom), İstanbul,
Turkey, 03 June 2023

IV. **Evaluating Path Selection Strategies with Blockchain-based Routing in Multi-Domain SDNs**
GÜLER E., KARAKUŞ M., Uludag S.
2022 International Balkan Conference on Communications and Networking (BalkanCom), Saraybosna, Bosnia And
Herzegovina, 22 - 24 August 2022, pp.6-10

V. **SpectrumChain: An Efficient Spectrum Management Framework in Blockchain-Enabled Flexible
SDONs**
Guler E., KARAKUŞ M., Uludag S.
2022 IEEE International Conference on Communications, ICC 2022, Seoul, South Korea, 16 - 20 May 2022,
vol.2022-May, pp.5744-5749

VI. **RoutingChain: A Proof-of-Concept Model for a Blockchain-Enabled QoS-Based Inter-AS Routing in
SDN**
Karakus M., Guler E.
IEEE International Black Sea Conference on Communications and Networking (IEEE BlackSeaCom), ELECTR
NETWORK, 26 - 29 May 2020

VII. **A First Look on QoS-enabled Inter-AS Routing in Software Defined Networks (SDN) using Smart
Contracts of Blockchain Technology**
KARAKUŞ M., AYBERKİN D.
3rd International Conference on AdvancedEngineering Technologies, Bayburt, Turkey, 19 - 21 September 2019,
pp.904-911

VIII. **Techno-Economic Analysis of Software-Defined Networking (SDN) and Various Control Plane Models**
KARAKUŞ M., Durresi A.
3rd International Conference on Advanced Engineering Technologies, Bayburt, Turkey, 19 - 21 September 2019, pp.611-620

IX. **Economic Analysis of Software Defined Networking (SDN) under Various Network Failure Scenarios**
Karakus M., Durresi A.
IEEE International Conference on Communications (IEEE ICC), Shanghai, China, 20 - 24 May 2019

X. **Economic Impact Analysis of Control Plane Architectures in Software Defined Networking (SDN)**
Karakus M., Durresi A.
IEEE International Conference on Communications (ICC) / Workshop on Integrating UAVs into 5G, Missouri, United States Of America, 20 - 24 May 2018

XI. **Software-defined Networking (SDN) Value Proposition over Different Network Architectures**
KARAKUŞ M., Durresi A.
1st International Balkan Conference on Communications and Networking (BalkanCom), Tirane, Albania, 30 May - 02 June 2017

XII. **Service Cost in Software Defined Networking (SDN)**
Karakus M., Durresi A.
31st IEEE International Conference on Advanced Information Networking and Applications (IEEE AINA), Taipei, Taiwan, 27 - 29 March 2017, pp.468-475

XIII. **A Scalability Metric for Control Planes in Software Defined Networks (SDNs)**
Karakus M., Durresi A.
30th IEEE International Conference on Advanced Information Networking and Applications (IEEE AINA), Crans-Montana, Switzerland, 23 - 25 March 2016, pp.282-289

XIV. **Economic Viability of QoS in Software Defined Networks (SDNs)**
Karakus M., Durresi A.
30th IEEE International Conference on Advanced Information Networking and Applications (IEEE AINA), Crans-Montana, Switzerland, 23 - 25 March 2016, pp.140-146

XV. **A Scalable Inter-AS QoS Routing Architecture in Software Defined Network (SDN)**
Karakus M., Durresi A.
IEEE 29th International Conference on Advanced Information Networking and Applications (IEEE AINA), Gwangju, South Korea, 25 - 27 March 2015, pp.148-154

XVI. **Low-complexity 3D Target Tracking in Wireless Aerial Sensor Networks**
Uludag S., Karakus M., Guier E.
IEEE International Conference on Communications (ICC), Sydney, Australia, 10 - 14 June 2014, pp.373-378

XVII. **Virtualized lab infrastructure on a budget for various computing and engineering courses**
Guler E., Uludag S., KARAKUŞ M., Turner S. W.
2012 International Conference on Information Technology Based Higher Education and Training, ITHET 2012, İstanbul, Turkey, 21 - 23 June 2012

XVIII. **Teaching computing and programming fundamentals via App Inventor for Android**
KARAKUŞ M., Uludag S., Guler E., Turner S. W., Ugur A.
2012 International Conference on Information Technology Based Higher Education and Training, ITHET 2012, İstanbul, Turkey, 21 - 23 June 2012

XIX. **Assessment of a Frugal, Virtual and Green Computing Lab Infrastructure of the Future**
Uludag S., Karakus M., Guler E., Turner S. W., Kita A.
Frontiers in Education Conference (FIE), Washington, United States Of America, 3 - 06 October 2012

XX. **Implementing IT0/CS0 with scratch, app inventor for android, and lego mindstorms**
Uludag S., KARAKUŞ M., Turner S. W.
2011 ACM Special Interest Group for Information Technology Education Conference, SIGITE'11, West Point, NY, United States Of America, 20 - 22 October 2011, pp.183-189

Supported Projects

Karakuş M., TUBITAK Project, İnternet Servis Sağlayıcıları Arasında Hizmet Kalitesi Temelli Akıllı Yönlendirme Modeli: Yazılım Tanımlı Ağ, Blokzincir Ve Makine Öğrenmesi Teknolojilerinin Kesişimi, 2021 - 2024

Activities in Scientific Journals

TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, Committee Member, 2021 - Continues

Scientific Refereeing

TUBITAK Project, 1507 - TÜBİTAK SME R&D Start Support Program, Ankara University, Turkey, June 2023
TUBITAK Project, 1001 - Program for Supporting Scientific and Technological Research Projects, Firat University, Turkey, April 2023
INTERNATIONAL JOURNAL OF INFORMATION SECURITY SCIENCE, Other Indexed Journal, January 2023
TBV Journal of Computer Science and Engineering, Other Indexed Journal, January 2023
TUBITAK Project, 3501 - National Young Researcher Career Development Program, Eskisehir Osmangazi University, Turkey, July 2021
TÜBİTAK International Bilateral Joint Cooperation Program Project, Hungary National Research, Development and Innovation Office, NRDI Bilateral Joint Cooperation Program, Bilgi ve Teknoloji Yönetim Tasarım ve Danışmanlık A. Ş., Turkey, June 2021
TUBITAK Project, 1002 - Quick Support Program, Erciyes University, Turkey, March 2021
TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, Journal Indexed in SCI-E, January 2021
IEEE TRANSACTIONS ON NETWORK AND SERVICE MANAGEMENT, Journal Indexed in SCI-E, January 2020
IEEE TRANSACTIONS ON RELIABILITY, Journal Indexed in SCI-E, January 2019
Information Systems and Operational Systems, Journal Indexed in SCI-E, January 2019
JOURNAL OF NETWORK AND COMPUTER APPLICATIONS, Journal Indexed in SCI-E, January 2019
IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, Journal Indexed in SCI-E, January 2019
INTERNATIONAL JOURNAL OF COMMUNICATION SYSTEMS, Journal Indexed in SCI-E, January 2019

Metrics

Publication: 38
Citation (WoS): 568
Citation (Scopus): 790
H-Index (WoS): 7
H-Index (Scopus): 9

Congress and Symposium Activities

IEEE 5th International Conference on Blockchain Computing and Applications 2023, Invited Speaker, Al-Kuwayt, Kuwait, 2023
IEEE International Mediterranean Conference on Communications and Networking 2023, Invited Speaker, Dubrovnik, Croatia, 2023

Invited Talks

Crossroads of Blockchain and Software Defined Networks: Status quo, Challenges, and Future Perspectives, Workshop, IEEE Blockchain Summit Turkey 2022, Turkey, November 2022

Scholarships

Yurt dışında lisanüstü öğrenim görmek üzere gönderilecek öğrencileri seçme ve yerleştirme (YLSY) , Ministry of Education, 2009 - 2018

Entrepreneurship Activities

Limited, PABASYS TECHNOLOGY YAZILIM DANISMANLIK TEKNOLOJI TICARET LIMITED SIRKETI, 28 September 2023, Co-Founder

Non Academic Experience

Indiana University Purdue University at Indianapolis
Indiana University-Purdue University at Indianapolis