

## Assoc. Prof. SULTAN ALDIRMAZ ÇOLAK

### Personal Information

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### Education Information

Doctorate, Yildiz Technical University, Faculty Of Electrical & Electronics, Electronics And Communication Engineering, Turkey 2006 - 2012

Postgraduate, Yildiz Technical University, Mühendislik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Pr., Turkey 2004 - 2006

Undergraduate, Kocaeli University, Mühendislik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Bölümü, Turkey 2000 - 2004

### Dissertations

Doctorate, Zaman-frekans dağılımları ve kesirli Fourier dönüşümü ile yeni haberleşme ve uyarlanabilir sistem tasarımları, Yıldız Teknik Üniversitesi, Elektrik-Elektronik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Bölümü, 2012

Postgraduate, Yayılı spektrum haberleşmesinde boğucu işaret çıkarımı, Yıldız Teknik Üniversitesi, Mühendislik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Pr., 2006

### Research Areas

Electrical and Electronics Engineering, Engineering and Technology

### Academic Titles / Tasks

Associate Professor, Kocaeli University, Mühendislik Fakültesi, Elektronik Ve Haberleşme Mühendisliği, 2020 - Continues

Assistant Professor, Kocaeli University, Mühendislik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Bölümü, 2018 - Continues

Assistant Professor, Kocaeli University, Mühendislik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Bölümü, 2013 - 2018

### Academic and Administrative Experience

Kocaeli Üniversitesi, Mühendislik Fakültesi, Elektronik Ve Haberleşme Mühendisliği Bölümü, 2015 - 2018

### Advising Theses

Aldırmaz Çolak S., Optimizing the Performance of Visible Light Communication System with Angular Diversity, Postgraduate, A.ULLAH(Student), 2020

Aldırmaz Çolak S., Bilişsel radyo sistemlerinde kümeleme ve derin öğrenme ile modülasyon sınıflandırma, Postgraduate, T.DEMİRCİ(Student), 2020

Aldırmaz Çolak S., Toward green heterogenous small-cell networks, Postgraduate, M.HEVESLİ(Student), 2019

Aldırmaz Çolak S., Haberleşme sistemlerinde enerji optimizasyonu ile etkin kanal katsayı adedinin en aza indirgenmesi, Postgraduate, Ü.ŞENOL(Student), 2019

Aldırmaz Çolak S., Handover performance for LTE-A and beyond heterogeneous networks, Postgraduate, A.YAYA(Student), 2019

ALDIRMAZ ÇOLAK S., Yazılım Tabanlı Radyo ile Gerçek Zamanlı PSK Alıcı Verici Yapısı Tasarımı, Postgraduate, M.Ali(Student), 2018

ALDIRMAZ ÇOLAK S., Energy Efficient Massive MIMO Design, Postgraduate, M.Abuibaid(Student), 2018

ALDIRMAZ ÇOLAK S., Uzun vadeli evrim temelli heterojen hücresele ağlarda girişim yönetimi ve en iyi röle seçimi, Postgraduate, E.Söylemez(Student), 2017

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Mobility Robustness Optimization in Future Mobile Heterogeneous Networks: A Survey**  
Tashan W., Shayea I., ALDIRMAZ ÇOLAK S., Ergen M., Azmi M. H. , Alhammadi A.  
IEEE ACCESS, vol.10, pp.45522-45541, 2022 (Journal Indexed in SCI)
- II. **Flexible Quadrature Spatial Pulse Amplitude Modulation for VLC Systems**  
ÇELİK Y., ALDIRMAZ ÇOLAK S., Basar E.  
IEEE SYSTEMS JOURNAL, 2021 (Journal Indexed in SCI)
- III. **A Secure and Privacy Friendly ECC Based RFID Authentication Protocol for Practical Applications**  
Arslan A., Colak S., ERTÜRK S.  
WIRELESS PERSONAL COMMUNICATIONS, vol.120, no.4, pp.2653-2691, 2021 (Journal Indexed in SCI)
- IV. **Extended fully improved quadrature spatial shift keying modulation**  
ÇELİK Y., ALDIRMAZ ÇOLAK S.  
SIGNAL IMAGE AND VIDEO PROCESSING, 2021 (Journal Indexed in SCI)
- V. **Pulse Index Modulation**  
ALDIRMAZ ÇOLAK S., AYDIN E., ÇELİK Y., Acar Y., Basar E.  
IEEE COMMUNICATIONS LETTERS, vol.25, no.7, pp.2309-2313, 2021 (Journal Indexed in SCI)
- VI. **Iterative interference alignment with spatial hole sensing in MIMO cognitive radio networks**  
NAMDAR M., BAŞGÜMÜŞ A., ALDIRMAZ ÇOLAK S., ERDOĞAN E., Alakoca H., Ustunbas S., Durak Ata L.  
ANNALS OF TELECOMMUNICATIONS, 2021 (Journal Indexed in SCI)
- VII. **A new spectrally efficient pilot scheme for OFDM systems**  
Acar Y., ALDIRMAZ ÇOLAK S.  
AEU-INTERNATIONAL JOURNAL OF ELECTRONICS AND COMMUNICATIONS, vol.129, 2021 (Journal Indexed in SCI)
- VIII. **Generalized quadrature spatial modulation techniques for VLC**  
Celik Y., ALDIRMAZ ÇOLAK S.  
OPTICS COMMUNICATIONS, vol.471, 2020 (Journal Indexed in SCI)
- IX. **Quadrature spatial modulation sub-carrier intensity modulation (QSM-SIM) for VLC**  
Celik Y., Colak S.  
PHYSICAL COMMUNICATION, vol.38, 2020 (Journal Indexed in SCI)
- X. **Key Challenges, Drivers and Solutions for Mobility Management in 5G Networks: A Survey**  
Shayea I., Ergen M., Hadri Azmi M., ALDIRMAZ ÇOLAK S., Nordin R., Daradkeh Y. I.  
IEEE ACCESS, vol.8, pp.172534-172552, 2020 (Journal Indexed in SCI)
- XI. **Channel estimation for OFDM-IM systems**  
Acar Y., ALDIRMAZ ÇOLAK S., Basar E.  
TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, vol.27, no.3, pp.1908-1921, 2019  
(Journal Indexed in SCI)
- XII. **A Novel Fractional Frequency Reuse Scheme for Interference Management in LTE-A HetNets**

- Khan S. A., Kavak A., Colak S., Küçük K.  
IEEE ACCESS, vol.7, pp.109662-109672, 2019 (Journal Indexed in SCI)
- XIII. **Interference Alignment in Multi-Hop Cognitive Radio Networks under Interference Leakage**  
ERDOĞAN E., Colak S., Alakoca H., Namdar M., Basgumus A., Durak-Ata L.  
APPLIED SCIENCES-BASEL, vol.8, no.12, 2018 (Journal Indexed in SCI)
- XIV. **Adaptive dual-mode OFDM with index modulation**  
ALDIRMAZ ÇOLAK S., ACAR Y., BAŞAR E.  
PHYSICAL COMMUNICATION, 2018 (Journal Indexed in SCI Expanded)
- XV. **Are RNGs Achilles' Heel of RFID Security and Privacy Protocols?**  
ARSLAN A., KARDAŞ S., ALDIRMAZ ÇOLAK S., ERTÜRK S.  
Wireless Personal Communications, pp.1-21, 2018 (Journal Indexed in SCI Expanded)
- XVI. **Toward green 5G heterogeneous small-cell networks: power optimization using load balancing technique**  
HAWASLI M., Colak S.  
AEU-INTERNATIONAL JOURNAL OF ELECTRONICS AND COMMUNICATIONS, vol.82, pp.474-485, 2017 (Journal Indexed in SCI)
- XVII. **Energy-efficient massive MIMO system: Exploiting user location distribution variation**  
Abuibaid M. A. , Colak S.  
AEU-INTERNATIONAL JOURNAL OF ELECTRONICS AND COMMUNICATIONS, vol.72, pp.17-25, 2017 (Journal Indexed in SCI)
- XVIII. **Preliminary set of analysis for the assessment of wind turbines which are in the line of sight of radar navigation and communications systems**  
SAYNAK U., ŞAMİL K., AHMET FARUK Ç., SENEM M. Y. , ALDIRMAZ ÇOLAK S., KARABAYIR O., YÜCEDAĞ O. M. , ÇOLAK M. A. , MUSTAFA Ü., BATI B., et al.  
Iet Radar Sonar And Navigation, vol.8, pp.415-424, 2014 (Journal Indexed in SCI Expanded)
- XIX. **Signal Adaptive Discrete Evolutionary Transform as a Sparse Time Frequency Representation**  
ALDIRMAZ ÇOLAK S., DURAK ATA L., AKAN A., CHAPARRO L. F.  
Digital Signal Processing, vol.23, pp.1747-1755, 2013 (Journal Indexed in SCI Expanded)
- XX. **Adaptive fractional Fourier domain filtering**  
DURAK ATA L., ALDIRMAZ ÇOLAK S.  
Signal Processing, vol.90, pp.1188-1196, 2010 (Journal Indexed in SCI Expanded)
- XXI. **Spectrally Efficient OFDMA Lattice Structure via Toroidal Waveforms on the Time Frequency Plane**  
ALDIRMAZ ÇOLAK S., SERBES A., DURAK ATA L.  
EURASIP Journal on Advances in Signal Processing, 2010 (Journal Indexed in SCI Expanded)

## Articles Published in Other Journals

- I. **Secrecy Capacity Analysis of an Underlay Cognitive Radio Network in the Presence of Co-channel and Primary Network Interference**  
Bayat E., ALDIRMAZ ÇOLAK S.  
ELECTRICA, vol.21, no.1, pp.105-114, 2021 (Journal Indexed in ESCI)
- II. **Novel OFDM System Using Orthogonal Pilot Symbols with Subcarrier Index Modulation**  
ACAR Y., ALDIRMAZ ÇOLAK S.  
Balkan Journal of Electrical and Computer Engineering, vol.7, no.4, pp.440-445, 2019 (Refereed Journals of Other Institutions)
- III. **Impact of small cell user density on performance of small cells sleeping technique for HetNet**  
Colak S.  
PAMUKKALE UNIVERSITY JOURNAL OF ENGINEERING SCIENCES-PAMUKKALE UNIVERSITESI MUHENDISLIK BILIMLERI DERGISI, vol.25, no.5, pp.519-524, 2019 (Journal Indexed in ESCI)
- IV. **Performance Analysis of a Secondary User in Cognitive Radio over Generalized-Gamma Fading**

## **Channels**

Colak S.

ELECTRICA, vol.19, no.2, pp.166-172, 2019 (Journal Indexed in ESCI)

## **V. BROADBAND INTERFERENCE EXCISION IN SPREAD SPECTRUM COMMUNICATION SYSTEMS BASED ON SHORT-TIME FOURIER TRANSFORMATION**

ALDIRMAZ ÇOLAK S., DURAK ATA L.

Progress In Electromagnetics Research B, vol.7, pp.309-320, 2008 (Refereed Journals of Other Institutions)

## **Books & Book Chapters**

### **I. Time-Domain Analysis of Modified Vivaldi Antennas**

ALDIRMAZ ÇOLAK S., TÜRKER TOKAN N.

in: Antennas and Wave Propagation, Pedro Pinho, Editor, IntechOpen, London, pp.39-56, 2018

### **II. Adaptive Fractional Fourier Domain Filtering in Active Noise Control**

ALDIRMAZ ÇOLAK S., DURAK ATA L.

in: Noise Control, Reduction and Cancellation Solutions in Engineering, Daniela Siano, Editor, IntechOpen, Rijeka, pp.29-46, 2012

## **Refereed Congress / Symposium Publications in Proceedings**

### **I. DoA Estimation in the Presence of Mutual Coupling Using Root-MUSIC Algorithm**

Atesavci C. S., Bahadirlar Y., ALDIRMAZ ÇOLAK S.

8th International Conference on Electrical and Electronics Engineering (ICEEE), Antalya, Turkey, 9 - 11 April 2021, pp.292-298

### **II. Feedback Channel Effect on the Performance of Interference Alignment**

ALDIRMAZ ÇOLAK S., NAMDAR M., BAŞGÜMÜŞ A., ERDOĞAN E., ALAKOCA H., üstünbaş s., DURAK ATA L.

2020 28th Signal Processing and Communications Applications Conference (SIU), Gaziantep, Turkey, Turkey, 5 - 07 October 2020

### **III. Capacity Variation of an Indoor MIMO VLC System for a Pyramid Receiver**

Khan A. U., ÇELİK Y., ALDIRMAZ ÇOLAK S.

2020 28th Signal Processing and Communications Applications Conference (SIU), Gaziantep, Turkey, Turkey, 5 - 07 October 2020

### **IV. On the Secrecy Performance of the K-User Cognitive Radio Network with Iterative Interference Alignment**

ERDOĞAN E., NAMDAR M., BAŞGÜMÜŞ A., ALDIRMAZ ÇOLAK S., ÜSTÜNBAŞ S., ALAKOCA H., DURAK ATA L.

2019 IEEE 30th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), Istanbul, Turkey, Turkey, 8 - 11 September 2019

### **V. A User Location Distribution Based FFR Strategy for Efficient Utilization of Radio Resources in LTE-A HetNets**

Khan S. A., ALDIRMAZ ÇOLAK S., KAVAK A., KÜÇÜK K.

1st International Informatics and Software Engineering Conference, 6 - 07 November 2019

### **VI. Dual-Mode Index Modulation Aided OFDM with Generalized Prefix**

Acar Y., Colak S., Cooklev T.

International Symposium on Networks, Computers and Communications (ISNCC), İstanbul, Turkey, 18 - 20 June 2019

### **VII. Receiver Design for Dual-Mode Index Modulation Aided OFDM**

Acar Y., Colak S.

2nd International Conference on Advanced Communication Technologies and Networking (CommNet), Rabat, Malta, 12 - 14 April 2019, pp.153-157

- VIII. **Impact of Partial Band Jammer in Cognitive Radio Networks with Interference Alignment**  
ERDOĞAN E., ALDIRMAZ ÇOLAK S., NAMDAR M., BAŞGÜMÜŞ A., Alakoca H., Durak Ata L.  
27th Signal Processing and Communications Applications Conference (SIU), Sivas, Turkey, 24 - 26 April 2019
- IX. **Minimizing The Number of Effective Channel Taps by Energy Optimization in Communications Systems**  
Kizilkaya U. S. , Colak S., ARSLAN H.  
27th Signal Processing and Communications Applications Conference (SIU), Sivas, Turkey, 24 - 26 April 2019
- X. **Yazılım Tanımlı Radyo ile Gerçek Zamanlı PSK Alıcı-Verici Tasarımı ve Gerçekleştirilmesi**  
Zengin M. A. , KÜÇÜK K., ALDIRMAZ ÇOLAK S.  
2018 26th Signal Processing and Communications Applications Conference (SIU 2018), Izmir, Turkey, Turkey, 2 - 05 May 2018
- XI. **Real-Time PSK Transceiver Design and Implementation using Software Defined Radio**  
ZENGİN m. a. , KÜÇÜK K., ALDIRMAZ ÇOLAK S.  
26th IEE SIGNAL PROCESSING AND COMMUNICATIONS APPLICATIONS CONFERENCE, 2 - 05 May 2018
- XII. **Heterojen Hücreli Ağlarda Girişim Aktarma için Af Tabanlı İşbirlikli Sistemlerde Röle Seçimi**  
SÖYLEMEZ E., ALDIRMAZ ÇOLAK S.  
25. Sinyal işleme ve iletişim uygulamaları kurultayı (SİU), 15 - 18 May 2017, pp.1-4
- XIII. **Büyük ölçekli MIMO Sistemlerde Enerji Verimliliğinin Kullanıcı Konumuna Göre Değişimi**  
ABUİBAİD M. A. , ALDIRMAZ ÇOLAK S.  
25. IEEE SINYAL İŞLEME ve İLETİSİM UYGULAMALARI KURULTAYI, 15 - 18 May 2017, pp.1-4
- XIV. **Relay Selection with AF Based Cooperative Systems for Interference Forwarding in HCN**  
SÖYLEMEZ E., ALDIRMAZ ÇOLAK S.  
25th Signal Processing and Communications Applications Conference (SIU), Antalya, Turkey, 15 - 18 May 2017
- XV. **DSP Tabanlı IFF Sistem Simülasyonu Tasarımı**  
Uzan N., Turan S., ALDIRMAZ ÇOLAK S.  
2016 24. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU), Zonguldak, Turkey, 16 - 19 May 2016
- XVI. **On the Performance of DCO OFDM Visible Light Communication Systems under Illumination Constraints**  
ALDIRMAZ ÇOLAK S., KIZILIRMAK R. Ç. , UYSAL M.  
International Conference on Transparent Optical Networks, Budapest, Hungary, 5 - 09 July 2015
- XVII. **Radar Menzili Verisinde Doğrusal Olmayan Yeniden Örnekleme Yaklaşımı**  
ALDIRMAZ ÇOLAK S., TURAN S., ERTÜRK S.  
23. IEEE Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SİU2015), Malatya, Turkey, 16 - 19 May 2015
- XVIII. **An investigation on number of effective taps for multicarrier schemes**  
ŞAHİN A., ALDIRMAZ ÇOLAK S., ARSLAN H.  
77th Vehicular Technology Conference (VTC Spring), Dresden, Germany, 1 - 05 June 2013
- XIX. **Wind Turbine Effects on Radar Performance**  
ALDIRMAZ ÇOLAK S., Saynak U., Karabayir O., Coskun A. F. , Serim H., Karahan S., Unal M., Bati B., Bati O., Colak M. A. , et al.  
21st Signal Processing and Communications Applications Conference (SIU), CYPRUS, 24 - 26 April 2013
- XX. **Doğrusal Frekans Kiplenmeli İşaretlerin Kesirli Fourier Boğgesinde Sıkıştırılabilir Algılanması**  
ALDIRMAZ ÇOLAK S., DURAK ATA L.  
2011 IEEE 19th Signal Processing and Communications Applications Conference (SIU), Antalya, Turkey, Turkey, 20 - 22 April 2011
- XXI. **Yeni Bir OFDM Kafes Yapısı: Zaman-Frekans Düzleminde Toroidal Kafes**  
ALDIRMAZ ÇOLAK S., SERBES A., DURAK ATA L.  
2010 IEEE 18th Signal Processing and Communications Applications Conference (SİU 2010), Diyarbakir, Turkey, Turkey, 22 - 24 April 2010
- XXII. **Cognitive OFDMA: Exploring a new FFT based detection technique for opportunistic usage**  
DEMİRDÖĞEN I., Birol A., Aldirmaz S., ARSLAN H., Durak L.  
2010 IEEE Radio and Wireless Symposium, RWW 2010, New Orleans, LA, United States Of America, 10 - 14 January

2010, pp.344-347

- XXIII. **On suitability of PSD method for opportunity detection in OFDM(A) based cognitive radio systems**  
Aldirmaz S., Birol A., Demirdogerr I., ARSLAN H., Durak L.  
2009 International Conference on Ultra Modern Telecommunications and Workshops, St Petersburg, Russia, 12 - 14 October 2009
- XXIV. **Method of Alternating Projections for Signal and Image Recovery in Fractional Fourier Domains**  
SERBES A., DURAK ATA L., ALDIRMAZ ÇOLAK S.  
3rd IFAC Workshop on Fractional Differentiation and its Applications, Ankara, Turkey, 5 - 07 November 2008
- XXV. **Kesirli Fourier Bölgesinde LMS Tabanlı Uyarlanırlı Süzgeçleme Algoritmaları ile Aktif Gürültü Kontrolü**  
ALDIRMAZ ÇOLAK S., DURAK ATA L., SERBES A.  
2008 IEEE 16th Signal Processing, Communication and Applications Conference (SİU 2008), Aydın, Turkey, 20 - 22 April 2008
- XXVI. **PERFORMANCE ANALYSIS OF AN STFT-BASED BROADBAND INTERFERENCE EXCISIONALGORITHM IN DS-SS SYSTEMS**  
ALDIRMAZ ÇOLAK S., DURAK ATA L.  
5th International Conference on Electrical and Electronics Engineering, Bursa, Turkey, 5 - 09 December 2007
- XXVII. **DS-SS Sistemlerde KSF D Tabanlı Genişbantlı Girişim Çıkarım Algoritması Ve Performans Analizi**  
ALDIRMAZ ÇOLAK S., DURAK ATA L.  
2007 IEEE 15th Signal Processing and Communications Applications (SİU 2007), Eskisehir, Turkey, Turkey, 11 - 13 June 2007

## Supported Projects

Aldirmaz Çolak S., Durak Ata L., Namdar M., Başgümüş A., Yazıcı M. A. , TUBITAK Project, 6G Telsiz Ağları için Ultra-Bağlantılılık: İHA ve Akıllı Yansıtıcı Yüzeylerle Heterojen Ağ Tasarımı, 2020 - 2023

Aldirmaz Çolak S., Çelik Y., TUBITAK Project, Mobil Mimo Görünür Işık Haberleşmesi İçin Yeni Nesil İndeks Tabanlı Modülasyonların Geliştirilmesi, 2019 - 2020

Aldirmaz Çolak S., Durak Ata L., Namdar M., Başgümüş A., Erdoğan E., Project Supported by Defense Industry, Interference Alignment in Cognitive Radio Networks (HIZA), 2017 - 2020

ALDIRMAZ ÇOLAK S., Industrial Thesis Project, Sayısal Radar Video Dağıtım Sistemi için Radar Sinyal İşleme Cihazının Geliştirilmesi Projesi, 2013 - 2015

## Activities in Scientific Journals

AEU International Journal of Electronics and Communications, Editor, 2017 - Continues

## Citations

Total Citations (WOS):76

h-index (WOS):6

## Scholarships

2214 Doktora sırası burs programı, TUBITAK, 2009 - 2009