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A. Ümit Keskin received his BSEE degree from Bogazici University in 1978, MSEE from Yildiz Technical University (1980) and PhD degree from the Institute of Science and Technology, Istanbul Technical University (1984). In 1985, he joined Siemens AG, Turkey. He was engaged in the field of Medical Instrumentation throughout his professional career. Since 2002, he is a staff member of Yeditepe University, Faculty of Engineering. His main research interests are analog circuits and signal processing, transducers, computational analysis, medical instrumentation theory and its applications.

List of Publications

Book Publication:

Ali Ümit Keskin, "Electrical Circuits in Biomedical Engineering, Problems with Solutions", Springer, 2017. ISBN: 978-3-319-55100-5 (Print), ISBN: 978-3-319- 55101-2 (Online). 810 pages.

SpringerLink: <https://link.springer.com/book/10.1007/978-3-319-55101-2>

International Publications (In Science Citation Index / Expanded):

1. Chunhua Wang, Jing Xu, Ali Ümit Keskin, Sichun Du and Qiuqing Zhang , "A new current-mode current controlled SIMO-type universal filter", AEU-International Journal of Electronics and Communications, Vol.: 65 Issue: 3 Pages: 231-234 , March 2011 ([PDF](#))
2. Dalibor Bišek, Ali Umit Keskin, Viera Biolková, "Grounded capacitor current mode SRCO using single modified CDTA", IET Circuits, Devices & Systems, Vol. 4, Iss. 6, pp. 496-502,2010, (doi: 10.1049/iet-cds.2009.0330) ([PDF](#))
3. Wang Chunhua , Ali Umit Keskin, Leng Yang, Zhang Qiuqing, Du Sichun, "Minimum Configuration Insensitive Multifunctional Current-Mode Biquad Using Current Conveyors and All-Grounded Passive Components", Radioengineering, vol.19, No:1, pp.178-184, April 2010
4. Ali Umit Keskin, Comments on the "Sensor calibration and compensation using artificial neural network", ISA Transactions - (Instrumentation, Systems, and Automation, Elsevier), Vol. 48, Issue 2, pp: 143-144, April 2009. ([PDF](#))
5. Ali Ümit Keskin, Kirat Pal, and Erhan Hancıoğlu, "Resistorless First Order All-pass Filter with Electronic Tuning", AEU -Int. J. Electronics and Communications, 62, (4) , pp. 304-306, 2008. ([PDF](#))

6. Dalibor Bišek, Erhan Hancıoğlu, Ali Ümit Keskin, "High-performance current differencing transconductance amplifier and its application in precision current-mode rectification", *AEU-Int. J. Electronics and Communications*, 62, (2) , pp.92-96, 2008. [\(PDF\)](#)
7. Ali Ümit Keskin, "Effects of PUVA Treatment on the Optical Properties of Blood/Tissue Storage Bags During Extracorporeal Photochemotherapy", *Transfusion and Apheresis Science*, vol 37, pp:139-143, 2007 [\(PDF\)](#)
8. Pradeep Kumar, Ali Umit Keskin, Kirat Pal, "Wide-band resistorless all-pass sections with single element tuning", *International Journal of Electronics*, 94 (6) pp.597-604, 2007. [\(PDF\)](#)
9. Ali Ümit Keskin and Ugur Cam, "Insensitive high-output impedance minimum configuration SITO-type current-mode biquad using dual-output current conveyors and grounded passive components", *AEU-Int. J. Electronics and Communications*, Vol.61, pp:341-344, 2007. [\(PDF\)](#)
10. Selçuk Kılınç, Ali Ümit Keskin, and Uğur Çam, "Cascadable Voltage-Mode Multifunction Biquad Employing Single OTRA". *Frequenz* vol.61, No: 3-4 pp.84-86, 2007. [\(PDF\)](#)
11. Varun Kumar, Ali Ümit Keskin, Kirat Pal, "DVCC-based single element controlled oscillators using all-grounded components and simultaneous current-voltage mode outputs", *Frequenz*, Vol.61, (3), pp:141-144, 2007. [\(PDF\)](#)
12. Ali Ümit Keskin, Dalibor Bišek, "Current mode quadrature oscillator using Current Differencing Transconductance Amplifiers (CDTA)", *IEE Proceedings on Circuits, Devices and Systems*, Vol.153, No.3, pp:214-218, 2006. [\(PDF\)](#)
13. Ali Ümit Keskin, Cemal Aydın, Erhan Hancıoğlu, Cevdet Acar, "Quadrature oscillators using Current Differencing Buffered Amplifiers", *Frequenz (Journal of RF-Engineering and Telecommunications)*, Vol.60,(3-4), pp:57-59, 2006. [\(PDF\)](#)
14. Berna Okudan, Ali Ümit Keskin, Asım Aydın, Gökhan Cesur, Selçuk Çömlekçi, Harun Süslü, "DEXA analysis on the bones of intrauterine and neonatal rats exposed to static and 50Hz electrical fields", *Bioelectromagnetics*, Vol. 27, No:7, pp: 589-592, 2006. [\(PDF\)](#)
15. Ali Ümit Keskin, "Design of a PID controller circuit employing CDBAs", *International Journal of Electrical Engineering Education*, Vol.43, (1), pp:48-56, Jan 2006. [\(PDF\)](#)
16. Ali Ümit Keskin, Dalibor Bišek, Erhan Hancıoğlu, Viera Biolková, "Current-mode KHN filter employing Current Differencing Transconductance Amplifiers", *AEU-Int. J. Electronics and Communications*, Vol.60, (6). pp: 443-446, 2006. [\(PDF\)](#)
17. Ali Ümit Keskin, "Multifunction biquad using single CDBA" , *Electrical Engineering (Archiv für Elektrotechnik)*, Vol.88, No: 5, pp: 353-356, June 2006. [\(PDF\)](#)
18. Ali Ümit Keskin, Erhan Hancıoğlu, "Current-Mode Multifunction Filter using two CDBAs", *AEU-Int. J. Electronics and Communications*, Vol. 59, No. 8, pp: 495-498, 2005. [\(PDF\)](#)
19. Berna Okudan, Mehmet Şahin, Feride Meltem Özbek, Ali Ümit Keskin, Erkan Cüre, "Detection of alveolar epithelial injury by Tc-99m dtpa radioaerosol inhalation lung scan in rheumatoid arthritis patients", *Annals of Nuclear Medicine (Japan)*, Vol.19, (6), pp: 461-466, 2005.
20. Ali Ümit Keskin, "Voltage mode notch filters using single CDBA", *Frequenz (Journal of RF-Engineering and Telecommunications)*, Vol. 59, (9-10), pp:225-228, 2005. [\(PDF\)](#)

21. Ali Ümit Keskin, Deniz Pazarci, Cevdet Acar, "Comment on the Paradoxical behavior of an infinite ladder network of inductors and capacitors", American Journal of Physics, Vol. 73, Issue 9, pp: 881-882, September 2005. ([PDF](#))
22. Ali Ümit Keskin, "Voltage-mode High-Q Band-pass Filters and Oscillators Employing Single CDBA and Minimum Number of Components", International Journal of Electronics, Vol.92, (8), pp:479-487, August 2005. ([PDF](#))
23. Ali Ümit Keskin and Erhan Hancıoğlu, "CDBA-based Synthetic Floating Inductance Circuits with Electronic Tuning Properties", ETRI Journal, Vol. 27, No. 2, pp: 239-242, April 2005. ([PDF](#))
24. Ali Ümit Keskin, "Single CFA-based NICs with impedance scaling properties", Journal of Circuits, Systems and Computers, Vol. 14, (2), pp:195-203, April 2005. ([PDF](#))
25. Ali Ümit Keskin, "A simple Analog Behavioral Model for NTC thermistors including selfheating effect", Sensors and Actuators-A, vol. 118-2, pp: 244-247, February 2005. ([PDF](#))
26. Ali Ümit Keskin, Tolga Meriç Yanar, "Steady-state solution of loaded thermistor problems using an electrical equivalent circuit model", Measurement Science and Technology, vol. 15, (10), pp: 2163-2169, 2004. ([PDF](#))
27. Ali Ümit Keskin, Fuat Bayrakçeken, "A simple signal processing application in flash spectroscopy", Asian Journal of Spectroscopy, Vol. 8, pp: 63-71, 2004.
28. Ali Ümit Keskin, "A Four Quadrant Analog Multiplier employing single CDBA", Analog Integrated Circuits and Signal Processing, Vol.40 (1), pp: 99-101, July 2004. ([PDF](#))
29. Ali Ümit Keskin, Ali Toker , "A NIC with impedance scaling properties using unity gain cells", Analog Integrated Circuits and Signal Processing, V-41,1, pp. 85-87, October 2004 ([PDF](#))
30. Ali Ümit Keskin, "Cascade approach for the realisation of high order VM filters using single CDBA-based first and second order sections", Frequenz (Journal of RF-Engineering and Telecommunications), Vol. 58, (7-8), pp:188-194, 2004. ([PDF](#))
31. Fuat Bayrakçeken, Ali Ümit Keskin, "Extinction coefficients and some photophysical properties of coronene in solution", Asian Journal of Spectroscopy, Vol. 8, No: 1, pp: 9-14, January 2004. ([PDF](#))
32. Fuat Bayrakceken, Aykut Bayrak , Ali Ümit Keskin , İpek Karaaslan, "In vitro, spectroscopic study of the retina of adult frog's eye", Asian Journal of Spectroscopy, Vol. 7, No: 3, pp:129-135, 2003.
33. Fuat Bayrakçeken, Ali Ümit Keskin, "Photochromism and thermochromism of trimethylindolinobenzospiropyran in methanol", Asian Journal of Spectroscopy, Vol. 7, No: 3, pp:137-141, 2003.
34. Fuat Bayrakçeken, Ali Ümit Keskin, "Triplet-triplet absorption of Salicylidene-p-toluidine in solution", Asian Journal of Spectroscopy, Vol. 7, No: 2, pp: 93-96, 2003.
35. Aykut Bayrak, Fuat Bayrakçeken, Ali Ümit Keskin, "Spectroscopic study of p-methoxy-styrene in aqueous media", Asian Journal of Spectroscopy, Vol. 7, No: 1, pp: 15-18, 2003.
36. Ali Ümit Keskin, "Fast computation of zoom-DFT via the Walsh transform", International Journal of Electronics, V.56, No:5, pp: 741-744, 1984. ([PDF](#))
37. Ali Ümit Keskin, "A simple analogue approach to fast Walsh transform", International Journal of Electronics, V.55, No:2, pp: 309-311, 1983. ([PDF](#))

International Symposium and Congress Presentations:

1. Sener Deniz, Ali Umit Keskin "Voltage-Mode All-pass Biquads Using Current Differencing Buffered Amplifiers (CDBA)", Proc. of the Fifth Intl. Conf. Advances in Computing, Communication and Information Technology- CCIT 2017, pp: 64-67, 02-03 September, Zurich, SWITZERLAND.
2. Ali Ümit Keskin, Şener Deniz, "Assessment of Fluid Contamination Based on Viscosity Measurements Using a Longitudinally Vibrating Plate", ISER-ICSTEM 2017, pp: 1-4, Crete, GREECE, 8-9 June 2017.
3. Ali Umit Keskin, Feride Sermin Utku, "Rheological Modelling of Bio-fluids Using Moving Coil Transducers", Paper No: ICBES 132, The 3rd World Congress on Biomedical Engineering and Systems (ICBES'16), Budapest, HUNGARY – August 17 – 18, 2016.
4. Omer Alper Yildiz, Gokhan Ertas, Ali Umit Keskin, "A Microcontroller-based Device for Erythrocyte Sedimentation Rate Measurements", BEBI 13, September 17-19, 2013, pp: 33-36, Baltimore, USA ([Paper ID 70604-112](#)) ([PDF](#))
5. Aylin Nuhoglu, Hakan Bozkurt, Ali Ümit Keskin, "Assessment of Electrode-Based Spontaneous Eye Blink Analysis", BEBI 11, August 23-25, 2011, Florence, ITALY (Paper ID 660-157) ([PDF](#))
6. Sehmuz Omer Yasar, Ali Umit Keskin "Wheelchair production in Turkey". National Science Foundation US-Turkish Workshop on Assistive Technology, June 6-8, 2011 Istanbul, TURKEY
7. Onur Deryahanoğlu, Ali Ümit Keskin, Alper Yıldız, "In Patient Safety, Using Medical Device Safely" . Fifth International Conference on Quality in Healthcare Accreditation and Patient Safety, QPS-Antalya 2011, April 13-16, 2011 ([PDF](#))
8. Ali Galip Şipka, Mehmet Ünsal, Emine Kurt, Ali Ümit Keskin. "Failure Modes and Effects Analysis (FMEA) For Processes of Patient and Staff Safety at Yeditepe University Hospital". Fifth International Conference on Quality in Healthcare Accreditation and Patient Safety, QPS-Antalya 2011, April 13-16, 2011 ([PDF](#))
9. Mehmet Ünsal, Ali Ümit Keskin, "Utility Management and Safety at Yeditepe University Hospital", The 2nd International Congress on Quality and Performance in Healthcare Promoting Hospitals and Safety. Antalya, 28th April - 01 May 2010
10. Ali Ümit Keskin, Cihat Koyuncu, "LED-based liquid cryogen level measurement", Second International Conference on Biomedical Electronics and Biomedical Informatics , (BEBI'09), Moscow, RUSSIA, p.161-164, ISBN:978-960-474-110-6, August 20-23, 2009 ([PDF](#))
11. Dalibor Biolek, Viera Biolkova, Ali Umit Keskin "Current mode quadrature oscillator using two CDTAs and two grounded capacitors", Fifth International Conference on System Science and Simulation in Engineering, (ICOSSE '06), Tenerife Canary Islands , SPAIN, December 16-18, 2006. ([PDF](#))
12. Ali Ümit Keskin, Erhan Hancioglu, Hakan Kuntman, "Current Mode KHN-Equivalent Biquad Using Dual-Output Current Conveyors", ELECO 2005, 7-11 December 2005, Bursa, TURKEY.
13. Ali Zeki, Ali Ümit Keskin, Ali Toker, "DXCCII-Based Four-Quadrant Analog Multipliers Using Triode Mosfets", ELECO 2005, 7-11 December 2005, Bursa, TURKEY. ([PDF](#))
14. Deniz Pazarcı, Ali Ümit Keskin, Cevdet Acar, "On The Behavior of The Input Impedance of The Infinite Ladder Network", ELECO 2005, 7-11 December 2005, Bursa, TURKEY.

15. Ali Ümit Keskin, Dalibor Biolek, Mehmet Said Yükselten, "Current Mode Multifunction Biquad using Single CDBA", WSEAS AEE 2005 International Conference, Prague, CZECH REPUBLIC, March 13-15, 2005. [\(PDF\)](#)
16. Ali Ümit Keskin, "Design of Minimum Component Oscillators Using Negative Impedance Approach Based On Different Single Active Elements", 12th IEEE Mediterranean Electrotechnical Conference, pp:83-86, MELECON, 12-15 May 2004, Dubrovnik, CROATIA. [\(PDF\)](#)
17. Erhan Hancıoğlu, Ali Ümit Keskin, "CMOS based NIC using unity gain cells", The 16th International Conference of Microelectronics, ICM, 6-8 December 2004, Tunis, TUNISIA.
18. Murat Şehirlioğlu, Ali Ümit Keskin, "A technique for design data input in PCB rapid prototyping", Proceedings of 4th International Symposium on Intelligent Manufacturing Systems, Decision Support Systems: September 6-8, pp: 238-244, 2004 - Sakarya.
19. Ali Ümit Keskin, "Wien bridge oscillator performances using current and voltage feedback amplifiers", ICSP 2003, 23-25, September 2003, Çanakkale. [\(PDF\)](#)
20. Ali Ümit Keskin, "Single resistor controlled oscillators employing current feedback amplifiers without external compensation", ICSP 2003, 23-25, September 2003, Çanakkale.
21. B. Okudan, A. Ü. Keskin, A. Aydın, G. Cesur, S. Comlekci, H. Suslu, "Investigation of the effects of static and 50Hz electromagnetic fields on intrauterine rat bones using DEXA analysis", EANM'05 - Annual Congress of the European Association of Nuclear Medicine October 15 - 19, 2005, Istanbul.
22. Ali Ümit Keskin, Dilek G. Yavuz, Oben Dag, Oguzhan Deyneli, Hasan Aydın, Tarçın O, Morkoyun E, Sema Akalin, "Artificial Neural Network-Based Diagnosis And Classification Of Thyroid Disorders", 30th Annual Meeting of The European Thyroid Association Congress, 19-22 September 2004, Istanbul.
23. Ali Ümit Keskin, "A technique for the measurement of mechanical integrity of bones using fast Walsh and Fourier Transforms". IEEE International Symposium on Electromagnetic Compatibility. August 23-25, 1983, Washington D.C., USA.

Other Journal Publications:

1. Gökhan Terzioğlu, Ali Ümit Keskin, Gülderen Yanıkkaya Demirel, "Measurement Methods of Cell Proliferation and a Comparison of Various Commercial Proliferation Kits", Turkish Journal of Immunology, 2013 ;1(3), pp:74-89 [\(PDF\)](#).
2. F.Bayrak, A.Ü.Keskin, G.Gemici, M.Degertekin, E.Demirtas "Contrast Echocardiography: History, Current Clinical Applications and Future Potentials", Yeditepe Medical Journal, Vol.1, pp:65-70, 2007. [\(PDF\)](#)
3. Biolek, D., Keskin, A.U., Biolkova, V., "Quadrature Oscillator using CDTA-based Integrators", WSEAS Transactions on Electronics, Vol. 3, No. 9, September 2006, pp. 463-469. [\(PDF\)](#)
4. Ali Ümit Keskin, İmran Göker, "A short note on the application of Cholesky factorization in MATLAB", Istanbul University, Journal of Electrical & Electronics Engineering (IU-JEEE), Vol.6, (1), pp: 113-115, 2006.
5. Ali Ümit Keskin, "The in vivo driving point impedance analysis of human tibia". Journal of Yıldız University, pp 13-21, 1984/3. [\(PDF\)](#)

Local Symposium-Congress Presentations:

1. Sibel Özbal, Ali Ümit Keskin, "GUI Based Heart Rate Variability Analysis and an Application" (Grafiksel Kullanıcı Arayüzü Tabanlı Kalp Atım Hızı Değişkenliği ve Uygulaması), BIYOMUT 17, 24-26 November, 2017, İstanbul
2. Tuğçe Yalta, Ali Ümit Keskin, "Design and Realization of a Patient Bed Scale", (Bir Hasta Yatağı Terazisi Tasarımı ve Gerçekleşmesi) TIPTEKNO 17,12-14 October 2017, Trabzon
3. Ugurcan Pala, Ali Ümit Keskin "Biyolojik Sıvıların Analizinde Titreşimsel Dönüştürücülerin Modellenmesi (Modelling of Vibrational Transducers in the Analysis of Biological Fluids), Biyomut 2016, 3-5 Kasım, 2016, Seferhisar, İzmir.
4. Merve Cansu Kirman, Simay Ürgüp, Ali Ümit Keskin, "Serebral Palsili Çocuklar İçin Bir Sandalye Tasarımı ve Gerçekleştirilmesi". (Design and Realization of a Chair for Children with Cerebral Palsy Disease), Biyomut 2014 , 16-17 October, 2014, İstanbul.
5. Gökhan Ertaş, Ali Ümit Keskin, "Doğrusal Olmayan İşaretlerin Analizinde Hurst Üsteli-Poincaré Parametrelerinin İlişkisi", (Correlation between Hurst Exponent and Poincaré Parameters in Non-linear Signal Analysis), Biyomut 2014, 16-17 October, 2014, İstanbul
6. Gökhan Ertaş, Ali Ümit Keskin, "Türkiye' de Biyomedikal Mühendisliği Lisans Programlarının Son Beş Yılı ve 2020 yılı için Öngörüler", (Last Five Years of Undergraduate Biomedical Engineering Programs in Turkey and Predictions for the year of 2020) , Biyomut 2014, 16-17 October, 2014, İstanbul
7. Atakan Kozik, Gökhan Ertaş ve Ali Ümit Keskin, "Tıbbi Amaçlı Bir Oksijen Ölçüm Cihazının Tasarımı ve Gerçekleştirilmesi" (Design and Realization of an Oxygen Measurement Device for Medical Applications), Biyomut, 3-5 Ekim 2012, İstanbul
8. Gökhan Ertaş, Ali Ümit Keskin ve Gülderen Yanıkkaya Demirel "Akan Hücre Ölçer Analizi için MATLAB Tabanlı Bir Grafik Ara-yüz Yazılım Geliştirilmesi" (Development of a MATLAB Based Graphical User Interface Software for Flow Cytometric Analysis), Biyomut, 3-5 Ekim 2012, İstanbul
9. Turkey Toklu, Ali Ümit Keskin, Serdar Öztezcan, "X- ışınlarının idrar test stripleri üzerindeki etkilerinin analizi" (Analysis of the influence of X-rays on urine dipsticks), Türk Biyokimya kongresi, Konya, 24-28 Eylül 2012
10. Gokhan Ertas ve Ali Ümit Keskin, "Türkiye' de Biyomedikal Mühendisliği Lisans Eğitimi," 16.Biyomedikal Mühendisliği Ulusal Toplantısı, 13-16 Ekim 2011, Antalya. Sözel bildiri. [\(PDF\)](#)
11. Hakan Bozkurt, Büşra Kahraman ve Ali Ümit Keskin, "Mikrodenetleyici Kontrollü İnsülin Pompası Tasarımı ve Gerçekleştirilmesi," 16.Biyomedikal Mühendisliği Ulusal Toplantısı, 13-16 Ekim 2011, Antalya. Sözel bildiri. [\(PDF\)](#)
12. Osman Melih Can, Ali Ümit Keskin, "Aköz humorden yakın kızılaltı spektroskopisiyle glikoz konsantrasyonu ölçümü", Tıp Teknolojileri Ulusal Kongresi, 14-15 Ekim 2010, Antalya
13. Ali Ümit Keskin, Cihat Koyuncu, "Doku saklama kaplarında sıvı kriyojen seviyesi ölçümü için bir yöntem",BIYOMUT 2010, 21-23 Nisan 2010, Antalya
14. Ali Demir, Ali Ümit Keskin, Mehmet Ünsal, Ali Bayram, "FMRG ile Hasta Tepki Süresinin Ölçülmesi için Bir Deney Düzenegi", BIYOMUT 2010, 21-23 Nisan 2010, Antalya
15. Abidin Altıntaş, Cem Ünsalan, Ali Ümit Keskin, Faruk Yencilek, "X-Işını imgelerinden böbrek taşlarının dinamik takibi", BIYOMUT 2010, 21-23 Nisan 2010, Antalya

16. Selcuk Kılınc, Ali Umit Keskin, Ugur Cam; "Tek Bir İşlemsel Geçiş-Direnç Kuvvetlendirici Kullanarak Gerilim Modlu Çok Fonksiyonlu İkinci Derece Süzgeçler" (Voltage Mode Multifunction Biquads Employing A Single Operational Transresistance Amplifier), 15. Sinyal İşleme ve İletişim Uygulamaları Kurultayı, Eskişehir, 11-13 Haziran 2007. ([PDF](#))
17. B.Okudan, F.M.Özbek, A.Doğan, B.Öztürk, A.Ü.Keskin, M.Yıldız, "The evaluation of the effect of trimetazidine on Tc-99m MIBI gated scintigraphy in patients with coronary artery ectasia", Nuclear Medicine Symposium, 30 April-3 May 2005, Ankara.
18. Erhan Hancıoğlu, Ali Ümit Keskin, "Birim kazançlı hücreler (UGC) kullanılarak CMOS negatif empedans dönüştürücü (NIC) gerçekleştirilmesi", 8-12 Aralık 2004, ELECO 2004, Bursa.
19. Ali Ümit Keskin and Melih Atabek , "Galvanik oksijen hücrelerinin çıkış işaretlerinin değerlendirilmesi", ICSP 2003, 23-25 Eylül 2003, Çanakkale.
20. Ali Ümit Keskin, "X-ışınları geri saçılımı ve güncel uygulamaları", 2. Tahribatsız Muayene Sempozyumu, 9-11 Ekim 2003, İstanbul.
21. Ali Ümit Keskin, Ömer Erdem, H. Avni Bölükbaşı, "Bilgisayarlı tomografide fiziksel artefaktların çift enerji yöntemiyle minimumlaştırılması". X.Ulusal Türk Radyoloji Kongresi, s-43, Kasım 1986, Antalya.
22. Ali Ümit Keskin, Ertuğrul Yazgan, "Fourier ve Walsh dönüşümleri yardımıyla insan tibia kemiğinin titreşim analizi". Türkiye'de Elektrik-Elektronik Endüstrisi Sempozyumu, s. 323-333, Eylül 1983, İ.T.Ü.
23. Ali Ümit Keskin, "Ayrık Fourier Dönüşümünün Ayrık Walsh Dönüşümü yardımıyla hızlı hesaplanması". Türkiye'de Elektrik-Elektronik Endüstrisi Sempozyumu, s.315-322, Eylül 1983, İ.T.Ü.