

## Prof. BARIŞ BAYRAM

### Personal Information

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### Education Information

Doctorate, Stanford University, Engineering Faculty, Electrical and Electronics Engineering, United States Of America  
2002 - 2006

Post Graduate, Stanford University, Engineering Faculty, Electrical and Electronics Engineering, United States Of America  
2000 - 2002

Under Graduate, İhsan Doğramacı Bilkent Üniversitesi, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği Bölümü,  
Turkey 1996 - 2000

### Foreign Languages

English, C1 Advanced

### Research Areas

Electrical and Electronics Engineering, Electronic, Electromagnetic, MEMS, Engineering and Technology

### Academic Titles / Tasks

Professor, Middle East Technical University, Faculty Of Engineering, Department Of Electrical And Electronics  
Engineering, 2018 - Continues

Associate Professor, Middle East Technical University, Faculty of Engineering, Elektrik-Elektronik Mühendisliği Bölümü,  
2014 - Continues

Assistant Professor, Middle East Technical University, Faculty of Engineering, Elektrik-Elektronik Mühendisliği Bölümü,  
2010 - 2014

Lecturer PhD, Middle East Technical University, Faculty of Engineering, Elektrik-Elektronik Mühendisliği Bölümü, 2007 -  
2010

Research Assistant, Stanford University, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği-Ginzton Laboratuvarı,  
2000 - 2006

### Advising Theses

Bayram B., DESIGN AND DEVELOPMENT OF FIBER OPTIC MEMS MICROPHONEMEASUREMENT SYSTEM, Post Graduate,  
E.MUHARREM(Student), 2019

Bayram B., Design and characterization of a MEMS membrane for a fiber optic microphone, Post Graduate,  
G.CİHAN(Student), 2019

BAYRAM B., Design and implementation of a single slope ADC for digital output cooled infrared readout integrated circuits, Post Graduate, F.AKYÜREK(Student), 2016

BAYRAM B., Integrated circuit design for annular capacitive micromachined ultrasonic transducer, Post Graduate, Y.KUTLUHAN(Student), 2015

BAYRAM B., Design and microfabrication of annular concentric capacitive micromachined ultrasonic transducer, Post Graduate, P.SHARIF(Student), 2014

BAYRAM B., Integrated circuit design for flip-chip bonded capacitive micromachined ultrasonic transducers, Post Graduate, M.MAADI(Student), 2013

BAYRAM B., Design and verification of diamond based capacitive micromachined ultrasonic transducer, Post Graduate, A.MURAT(Student), 2011

BAYRAM B., Development and microfabrication of capacitive micromachined ultrasound transducers with diamond membranes, Post Graduate, M.CEZAR(Student), 2011

### Articles Published in Journals That Entered SCI, SSCI and AHCI Indexes

- **Design and characterization of a buckling-resistant perforated MEMS membrane under residual stress**  
Bozyigit M. A. , Sahin A. B. , BAYRAM B.  
JOURNAL OF MICROMECHANICS AND MICROENGINEERING, vol.30, 2020 (Journal Indexed in SCI)
- **Digital output ROIC with single slope ADC for cooled infrared applications**  
Akyurek F., BAYRAM B.  
MICROSYSTEM TECHNOLOGIES-MICRO-AND NANOSYSTEMS-INFORMATION STORAGE AND PROCESSING SYSTEMS, vol.23, pp.1091-1099, 2017 (Journal Indexed in SCI)
- **Radiation impedance study of a capacitive micromachined ultrasonic transducer by finite element analysis**  
BAYRAM B.  
JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA, vol.138, pp.614-623, 2015 (Journal Indexed in SCI)
- **Custom integrated circuit design for ultrasonic therapeutic CMUT array**  
Maadi M., BAYRAM B.  
MICROSYSTEM TECHNOLOGIES-MICRO-AND NANOSYSTEMS-INFORMATION STORAGE AND PROCESSING SYSTEMS, vol.21, pp.875-891, 2015 (Journal Indexed in SCI)
- **Plasma-activated direct bonding of patterned silicon-on-insulator wafers to diamond-coated wafers under vacuum**  
Can U. I. , BAYRAM B.  
DIAMOND AND RELATED MATERIALS, vol.47, pp.53-57, 2014 (Journal Indexed in SCI)
- **Diamond-Based Capacitive Micromachined Ultrasonic Transducers in Immersion**  
Cetin A. M. , BAYRAM B.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.60, pp.414-420, 2013 (Journal Indexed in SCI)
- **Diamond-based capacitive micromachined ultrasonic transducers**  
Bayram B.  
DIAMOND AND RELATED MATERIALS, vol.22, pp.6-11, 2012 (Journal Indexed in SCI)
- **Microfabrication of vacuum-sealed cavities with nanocrystalline and ultrananocrystalline diamond membranes and their characteristics**  
BAYRAM B., Altinoluk H. S.  
DIAMOND AND RELATED MATERIALS, vol.20, pp.1149-1154, 2011 (Journal Indexed in SCI)
- **Fabrication of SiO<sub>2</sub>-stacked diamond membranes and their characteristics for microelectromechanical applications**  
BAYRAM B.  
DIAMOND AND RELATED MATERIALS, vol.20, pp.459-463, 2011 (Journal Indexed in SCI)

- **Plasma-activated direct bonding of diamond-on-insulator wafers to thermal oxide grown silicon wafers**  
Bayram B., Akar O., Akın T.  
DIAMOND AND RELATED MATERIALS, vol.19, pp.1431-1435, 2010 (Journal Indexed in SCI)
- **Finite element modeling and experimental characterization of crosstalk in 1-D CMUT arrays**  
BAYRAM B., Kupnik M., Yaralioglu C. G. , Oralkan O., Ergun A. S. , Lin D., Wong S. H. , Khuri-Yakub B. T.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.54, pp.418-430, 2007 (Journal Indexed in SCI)
- **Comparison of conventional and collapsed region operation of capacitive micromachined ultrasonic transducers**  
Huang Y., Haeggstrom E., BAYRAM B., Zhuang X., Ergun A. S. , Cheng C., Khuri-Yakub B. T.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.53, pp.1918-1933, 2006 (Journal Indexed in SCI)
- **Experimental characterization of collapse-mode CMUT operation**  
Oralkan O., BAYRAM B., Yaralioglu G. G. , Ergun A. S. , Kupnik M., Yeh D. T. , Wygant I. O. , Khuri-Yakub B. T.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.53, pp.1513-1523, 2006 (Journal Indexed in SCI)
- **Dynamic analysis of capacitive micromachined ultrasonic transducers**  
BAYRAM B., Yaralioglu G., Kupnik M., Ergun A., Oralkan O., Nikoozadeh A., Khuri-Yakub B.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.52, pp.2270-2275, 2005 (Journal Indexed in SCI)
- **Capacitive micromachined ultrasonic transducer design for high power transmission**  
BAYRAM B., Oralkan O., Ergun A., Haeggstrom E.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.52, pp.326-339, 2005 (Journal Indexed in SCI)
- **A new regime for operating capacitive micromachined ultrasonic transducers**  
BAYRAM B., Haeggstrom E., Yaralioglu G., Khuri-Yakub B.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.50, pp.1184-1190, 2003 (Journal Indexed in SCI)
- **Calculation and measurement of electromechanical coupling coefficient of capacitive micromachined ultrasonic transducers**  
Yaralioglu G., Ergun A., BAYRAM B., Haeggstrom E., Khuri-Yakub B.  
IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, vol.50, pp.449-456, 2003 (Journal Indexed in SCI)

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

- **Capacitive micromachined ultrasonic transducer arrays for integrated diagnostic/therapeutic catheters**  
Wong S. H. , Wygant I. O. , Yeh D. T. , Zhuang X., BAYRAM B., Kupnik M., Oralkan O., Ergun A. S. , Yaralioglu G. G. , Khuri-Yakub B. T.  
5th International Symposium on Therapeutic Ultrasound, Massachusetts, United States Of America, 27 - 29 October 2005, vol.829, pp.395-396
- **FINITE ELEMENT ANALYSIS OF CMUTs: CONVENTIONAL VS. COLLAPSE OPERATION MODES**  
Yaralioglu G. G. , BAYRAM B., Khuri-Yakub B. T.  
IEEE Ultrasonics Symposium, Vancouver, Canada, 3 - 06 October 2006, pp.586-589
- **FINITE ELEMENT ANALYSIS OF FABRICATION RELATED THERMAL EFFECTS IN CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCERS**  
Kupnik M., Ergun A. S. , Yaralioglu G. G. , BAYRAM B., Oralkan O., Wong S. H. , Lin D., Khuri-Yakub B. T.  
IEEE Ultrasonics Symposium, Vancouver, Canada, 3 - 06 October 2006, pp.942-945

## ● **ACOUSTIC CROSSTALK REDUCTION METHOD FOR CMUT ARRAYS**

BAYRAM B., Yaralioglu G. G. , Kupnik M., Khuri-Yakub B. T.

IEEE Ultrasonics Symposium, Vancouver, Canada, 3 - 06 October 2006, pp.590-593

## ● **Finite element modeling of capacitive micromachined ultrasonic transducers**

Yaralioglu G., BAYRAM B., Nikoozadeh A., Khuri-Yakub B.

Medical Imaging 2005 Conference, California, United States Of America, 15 - 17 February 2005, vol.5750, pp.77-86

## ● **Characterization of cross-coupling in capacitive micromachined ultrasonic transducers**

BAYRAM B., Kupnik M., Yaralioglu G., Oralkan O., Lin D., Zhuang X., Ergun A., Sarioglu A., Wong S., Khuri-Yakub B.

IEEE International Ultrasonics Symposium, Rotterdam, Netherlands, 18 - 21 September 2005, pp.601-604

## ● **CMUT ring arrays for forward-looking intravascular imaging**

Oralkan Ö., Hansen S. T. , Bayram B., Yaralioglu G. G. , Ergun A. S. , Khuri-Yakub B. T.

2004 IEEE Ultrasonics Symposium, Montreal, Canada, 23 - 27 August 2004, vol.1, pp.403-406

## ● **Analytical calculation of collapse voltage of CMUT membrane**

Nikoozadeh A., BAYRAM B., Yaralioglu G., Khuri-Yakub B.

IEEE Ultrasonics Symposium, Montreal, Canada, 23 - 27 August 2004, pp.256-259

## ● **CMUT ring arrays for forward-looking intravascular imaging**

Oralkan O., Hansen S., BAYRAM B., Yaralioglu G., Ergun A., Khuri-Yakub B.

IEEE Ultrasonics Symposium, Montreal, Canada, 23 - 27 August 2004, pp.403-406

## ● **High-frequency CMUT arrays for high-resolution medical imaging**

Oralkan O., Hansen S., BAYRAM B., Yaralioglu G., Ergun A., Khuri-Yakub B.

IEEE Ultrasonics Symposium, Montreal, Canada, 23 - 27 August 2004, pp.399-402

## ● **Dynamic FEM analysis of multiple cMUT cells in immersion**

BAYRAM B., Yaralioglu G., Ergun A., Oralkan O., Khuri-Yakub B.

IEEE Ultrasonics Symposium, Montreal, Canada, 23 - 27 August 2004, pp.252-255

## ● **Dynamic analysis of CMUTs in different regimes of operation**

BAYRAM B., Haeggstrom E., Ergun A., Yaralioglu G., Khuri-Yakub B.

IEEE International Ultrasonics Symposium, Hawaii, United States Of America, 5 - 08 October 2003, pp.481-484

## ● **Collapsed regime operation of capacitive micromachined ultrasonic transducers based on wafer-bonding technique**

Huang Y., Haeggstrom E., BAYRAM B., Zhuang X., Ergun A., Cheng C., Khuri-Yakub B.

IEEE International Ultrasonics Symposium, Hawaii, United States Of America, 5 - 08 October 2003, pp.1161-1164

## ● **Residual stress and Young's modulus measurement of capacitive micromachined ultrasonic transducer membranes**

Yaralioglu G., Ergun A., BAYRAM B., Marentis T., Khuri-Yakub B.

IEEE International Ultrasonic Symposium, Georgia, United States Of America, 7 - 10 October 2001, pp.953-956

## ● **Influence of the electrode size and location on the performance of a CMUT**

BAYRAM B., Yaralioglu G., Ergun A., Khuri-Yakub B.

IEEE International Ultrasonic Symposium, Georgia, United States Of America, 7 - 10 October 2001, pp.949-952

## **Supported Projects**

BAYRAM B., ÖZMEN G. C. , Project Supported by Higher Education Institutions, Fiber optik MEMS mikrofonların tasarımı ve karakterizasyonu, 2018 - 2019

Bayram B., Şahin A. B. , TUBITAK Project, Özgün Mems Mikrofonların Geliştirilmesi, 2016 - 2019

BAYRAM B., Project Supported by Higher Education Institutions, MEMS kapasitif ultrasonik çevirgeçlerin sonlu elemanlar yöntemi yardımıyla tasarımı ve simulasyonunun yapılması, 2016 - 2016

BAYRAM B., Project Supported by Higher Education Institutions, Pulların Moleküler Bağ Metoduyla Birleştirilmesi Metodunun Elmas MEMS Uygulamalarına Yönelik Geliştirilmesi, 2015 - 2015

BAYRAM B., Project Supported by Higher Education Institutions, Elmas Membranli Kapasitif Ultrason Çevirgeç Dizilerinin Mikroüretimi, 2014 - 2014

BAYRAM B., Sharif P., Project Supported by Higher Education Institutions, 2-D Elmas Membranli Tedavi Amaçlı Mikroüretilmiş Kapasitif Ultrason Çevirgeç Dizilerinin Mikroüretimi, 2013 - 2013

BAYRAM B., Project Supported by Higher Education Institutions, 2-D Elmas Tabanlı Kapasitif Mikroüretilmiş Ultrasonik Çevirgeçlere Yönelik Özgün Entegre Devre Tasarımı Ve Karakterizasyonu, 2012 - 2012

BAYRAM B., Project Supported by Higher Education Institutions, Yüksek Frekanslı Elmas Membranlı Mikroüretilmiş Kapasitif Ultrason Çevirgeçler, 2011 - 2011

BAYRAM B., Project Supported by Higher Education Institutions, Elmas Membranlı Tedavi Amaçlı Mikroüretilmiş Kapasitif Ultrason Çevirgeçler, 2010 - 2010

## Patent

BAYRAM B., A method for microfabrication of a capacitive micromachined ultrasonic transducer comprising a diamond membrane and a transducer thereof, Patent, CHAPTER H Electricity, Initial Registration, 2015

BAYRAM B., Bir elmas membran ve bir çevirgeçten oluşan bir kapasitif mikroüretilmiş ultrasonik çevirgecin mikroüretim yöntemi, Patent, CHAPTER H Electricity, Initial Registration, 2014

BAYRAM B., Method for Microfabrication of a Capacitive Micromachined Ultrasonic Transducer comprising a Diamond Membrane and a Transducer Thereof, Patent, CHAPTER H Electricity, Initial Registration, 2013

BAYRAM B., Acoustic Crosstalk Reduction Method for CMUTs in Immersion, Patent, CHAPTER H Electricity, Initial Registration, 2010

BAYRAM B., Method and System for Operating Capacitive Membrane Ultrasonic Transducers, Patent, CHAPTER H Electricity, Initial Registration, 2007

## Citations

Total Citations (WOS):657

h-index (WOS):13

## Awards

Bayram B., TUBA GEBIP, Tuba, June 2011