

# Alper ŞİŞMAN

**Birth of Date** : 15.05.1977  
**Marital Status** : Married  
**E-Mail** : [alper.sisman@marmara.edu.tr](mailto:alper.sisman@marmara.edu.tr)

## Education

- 2005-2010 Işık University, Istanbul, Turkey  
Ph. D. in Electronics Engineering  
*Thesis: Solid-State Arrays and Beamformers for Side-Looking Intravascular Ultrasonic Imaging.*
- 2000-2002 Işık University, Istanbul, Turkey  
M.S. in Electronics Engineering  
*Thesis: Design and Implementation of a Low-cost Telematic Control System.*
- 1994-1998 Istanbul Technical University, Istanbul, Turkey  
BSc in Electrical Engineering  
*Graduation Project: Design and Implementation of a PID controller employing feedback circuitry for DC motors. (TMS320C50 Texas instruments Digital Signal Processor was used)*
- 1993-1994 Istanbul Technical University, Istanbul, Turkey  
English Proficiency Preparation Class

## Work Experience

- 2011-2012 **Research Scholar**  
Mechanical Engineering Dept., South Florida University, Tampa, FL, USA
- 2010-.. **Asst. Prof. Dr.**  
Electrical&Electronics Engineering Dept., Marmara University, Istanbul, Turkey  
Courses taught: Electronics, Linear Algebra, Digital System Design
- 2003-2010 **Research Asistant/Dr. Lecturer**  
Electronics Engineering Dept., Işık University, Istanbul, Turkey  
Courses taught: Electronics I, Electronics Lab., Circuit Lab.  
Courses assisted: Electronics I-II, Digital Signal Processing, Signals and Systems, Electric circuits, Electromagnetic Theory, Biomedical Systems & Devices.
- 2002-2009 **Founder&Shareholder**  
MobiartsCommunication Systems Ltd., Istanbul, Turkey
- Completed Projects:  
**Otomubul:** A low-cost Vehicle Navigation System. Patent & Product names are registered to Mobiarts (Patent Number: 2003/02114&2003). The device includes a custom algorithm to estimate the location of the car. Also user can control some functions of the car using a mobile phone. The project was an extension of the master thesis.  
**Mobilarm:** A house/office alarm system, which employs a GSM module that sends alarm messages to the authenticated users in case of emergency. Patent & Product names are registered to Mobiarts (Publication number: WO/2005/057516). Project was supported by TEYDEB (TUBITAK, the Scientific and Technological Research Council of Turkey).  
**Mobix:** Fixed Cellular Terminal (FCT). The device was the most purchased FCT by TURKCELL (Leading GSM operator in Turkey) as of September 2008.  
**OtomubulGPS:** Several remote vehicle navigation systems including GSM/GPRS module. (firmware platforms are C, Python and J2ME)
- 1999-2002 **Senior R&D Engineer**  
Mobile Systems Division, Teknobil A.S., Istanbul, Turkey
- Completed Projects:  
**Several Accessory Designs for Thuraya Satellite Phones**  
*Vehicle kit:* Simply a vehicle kit that enables the satellite phone inside the vehicle. It has noise reduction and echo cancellation module, and a firmware module allows remote navigation system by using satellite phone's internal GPS.  
*Indoor kit:* A device that enables the indoor use of satellite phones. It operates like a fixed cellular terminal.

### **Prepaid or Remote Dischargeable Water/Electrical Meter Designs**

A design was implemented for both water and electrical meters. It has a GSM module as server. The clients(meters) in the same building are connected to the server unit via RS-485 network. GSM module uses short message service or Data connection to establish communication between meters and the database PC.

### **Vehicle Navigation System Designs**

Many off-line (Stores the vehicle's location information and some other required analog or digital data to an internal EEPROM module. The stored data can be transferred to server via serial port) and on-line (Device can also send the recorded data via data connection or sends the momentary data on request) systems are designed.

1998-1999

#### **R&D Engineer,**

Military Projects Division, Inter Electronics A.S., Istanbul, Turkey

A Radio Control Unit is designed to improve Marconi radios. Voice compression algorithm is studied. Linear Predictive Coding algorithm was implemented using Texas Instruments TMS320C50 Digital signal processor.

### **Research Projects**

#### **International Projects**

**A Novel, Low Cost, Ultra-sensitive Nanosensor for Early Ovarian Cancer Detection:** (The study is supported by the Bankhead-Coley Cancer Research Program, the Florida Department of Health), (Grant #1BN04-34183). Project involves the development of a surface acoustic wave sensor that can quantify the Bcl-2 protein level in the human urine.

#### **Tubitak Projects**

**Novel Methods for Medical Ultrasonic Endoscopic Imaging:**(Project No: 106M333) New synthetic aperture techniques, which reduce the number of firings, were developed for 3D real-time miniaturized ultrasonic imaging systems.

Digital Ultrasonic Generator Design for Cleaning Machines: (Project No: AGY300-03)

#### **BAP projects**

**A New Ultrasonic Method to Detect the Welding Faults:**(Project No: FEN-B-090512-0158) Surface acoustic waves is used to detect the welding faults.

**New Techniques and Systems for 3D Medical Ultrasound Imaging:** (BAP-05B301) New excitation schemes and array structures are investigated enabling 3-Dimensional imaging.

**Array Design for 3-D Intracardiac Ultrasound Imaging:** (BAP- 06A301) New array structures enabling the further miniaturization are investigated.

#### **MSc and PhD Thesis**

**Solid-State Arrays and Beamformers for Side-Looking Intravascular Ultrasonic Imaging (PhD Thesis):** Existing Side-looking intravascular ultrasonic probes were investigated. New array and probe structures were studied to improve image quality and to use less resources like number of channels, front-end electronics etc. A rotating concentric annular array and 1.5D solid-state arrays were proposed and investigated by computer simulations & experimental studies (Filing an invention disclosure and a provisional patent application are in progress). *The study was realized with our collaborator group in Georgia Institute of Technology.*

**Design and Implementation of a Low cost Telematic Control System (Graduate Thesis):** The communication protocol between Ericsson A-1018 GSM phone and a PCMCIA modem was decrypted. The GSM phone was used as a GSM modem to reduce the system cost. The decrypted protocol was implemented on a custom-design prototype circuit.

#### **Assisted Undergraduate Thesis**

- Serial Port to TCP/IP converter:The device connects a serial port and a pre-defined IP number. A proper hardware was designed and TCP/IP stack was realized
- GSM based gate control and automation system
- GSM based general purpose telematic control system
- GPS data logger device, design & implementation

## Patents

- Otomubul: A low-cost Vehicle Navigation System: Patent Number: 2003/02114&2003/30592.
- Mobilarm: A GSM-based security System: Patent Number: WO2005057516
- A novel design for solid-state side-looking IVUS: Filing an invention disclosure and a provisional patent application are in progress
- 

## Awards

- TIM, Turkish Exporters' Assembly Innovative Project Award, 2012.
- Marmara University 130<sup>th</sup> year Academic Achievement Award, 2013

## Professional Associations

- Reviewer of IEEE Transactions on Biomedical Circuit and Systems Papers
- Reviewer of Journal of Control Science and Engineering Papers
- Reviewer of Turkish Journal of Electrical Engineering & Computer Sciences Papers
- IEEE Member
- 

## Publications

- Journal Papers (indexed in SCI/SCI-E),
  1. O. Onen, A. Sisman, N. D. Gallant, P. Kruck, R. Guldiken "A Urinary Bcl-2 Surface Acoustic Wave Biosensor for Early Ovarian Cancer Detection," MDPI Sensors.
  2. G. Gurun, J. Zahorian, A. Sisman, M. Karaman, P. Hasler and F. L. Degertekin, "An Analog Integrated Circuit Beamformer for High-Frequency Medical Ultrasound Imaging," IEEE Trans. Ultrason., Ferroelect., Freq. Contr.
  3. A. Sisman, J. Martinez, O. Onen, D. Velasquez, R. Guldiken "A Synthetic Phased Array Surface Acoustic Wave Sensor for Quantifying Bolt Tension," MDPI Sensors.
- Presentations at International Conferences (Peer-Reviewed)
  1. A. Sisman, M. Karaman, G. Gurun, F. L. Degertekin, "A Novel Ultrasonic Method to Quantify Pressure in Bolted Joints," UCIP International Ultrasonics Symposium, Spain, Madrid, 2012.
  2. A. Sisman, M. Karaman, G. Gurun, F. L. Degertekin, "Solid-state SL-IVUS Arrays Based on Non-uniform Aperture Sampling," IEEE International Ultrasonics Symposium, USA, San Diego, 2010.
  3. A. Sisman, J. Zahorian, G. Gurun, M. Karaman, M. Balantekin, F. L. Degertekin, P. Hasler, "Evaluation of CMUT Annular Arrays for Side-looking IVUS," Proc. IEEE Ultrason. Symp., pp, 2774-2777, Rome, Italy, 2009. (Selected as one of the finalists in the Student Paper Competition)
  4. G. Gurun, A. Şişman, M. Karaman, P. Hasler, F. L. Degertekin, "A Tunable Analog Delay Element for High-Frequency Dynamic Beamforming," Proc. IEEE Ultrason. Symp., pp, 345-348, Rome, Italy, 2009.
  5. J. Zahorian, G. Gurun, M. Hochman, S. Satir, A. Sisman, P. Hasler, M. Karaman and F.L. Degertekin, "Annular CMUT arrays and integrated electronics for intravascular ultrasound imaging," MUT 2009 Workshop, Besancon, France, May 28-29, 2009.
  6. J. Zahorian, R. Guldiken, G. Gurun, S. Qureshi, M. Balantekin, S. Carlier, A. Şişman, M. Karaman, F. L. Degertekin, "Annular CMUT Arrays for Side Looking Intravascular Ultrasound Imaging," Proc. IEEE Ultrason. Symp., pp. 723-727, New York, USA, 2007.
  7. R. Guldiken, J. Zahorian, M. Balantekin, F. L. Degertekin, C. Tekeş, A. Şişman, M. Karaman, "Dual-Annular-Ring CMUT array for forward-looking IVUS imaging," Proc. IEEE Ultrason. Symp., pp. 698-701, Vancouver, Canada, 2006.
- Presentations at National Conferences
  1. A. Sisman, M. Karaman, "Analysis of Catheter-based Imaging Devices for Side-looking IVUS," BİYOMUT, 14th National Biomedical Engineering Meeting, pp. 1-4, Dokuz Eylül Üniversitesi, 2009
  2. A. Sisman, M. Karaman, " Array Processing for 3D Ultrasound Imaging," BİYOMUT, 12th National Biomedical Engineering Meeting, Boğaziçi Üniversitesi, 2007