



## **Prof. Dr. Halûk Gümüşkaya**

**November 2011**

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## 1. Personal Data

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*Web Site* : <http://www.gumuskaya.com>  
*Birth Date* : 27-04-1964, Bursa  
*Marital Status* : Married and having three children

## 2. Professional Experience

### Full Time

**Dates** : **September/2010 – Present**  
*Institution* : Gediz University, Computer Engineering Department  
*Title* : Professor, Head of Department  
*Services* : Head of Department, Computer Engineering, 9/2010 – Present  
*A member of*

- Faculty Executive Board (Fakülte Yönetim Kurulu), 1/2011 – Present
- Faculty Board (Fakülte Kurulu), 9/2011 – Present
- Institute Executive Board, The Institute for Graduate Studies in Sciences and Engineering, 12/2010 – Present
- Institute Board, The Institute for Graduate Studies in Sciences and Engineering, 9/2010 – Present

**Dates** : **September/2008 – September/2010**  
*Institution* : Haliç University, Computer Engineering Department  
*Title* : Professor, Head of Department  
*Services* : Head of Department, Computer Engineering, 3/2009 – 9/2010  
*A member of*

- Engineering Faculty Executive Board, 9/2008 – 9/2010
- Engineering Faculty Board, 9/2008 – 9/2010
- Institute Board, The Institute for Graduate Studies in Sciences and Engineering, 3/2009 – 9/2010

**Dates** : **August/2002 – August/2008**  
*Institution* : Fatih University, Computer Engineering Department  
*Title* : Associate Professor  
*Services* : *A member of*

- Faculty Executive Board, 10/2002 – May 2007
- Faculty Board of Engineering Faculty, 10/2002 – May 2007
- Information Technologies Committee, 6/2006 – 7/2008

**Dates** : **May/1997 – July/2002**  
*Institution* : The Scientific and Technical Research Council of Turkey – National Research Institute of Electronics and Cryptology (TÜBİTAK – UEKAE)  
*Title* : Chief Researcher (Başuzman Araştırmacı), Project Manager

**Dates** : **March/1990 – May/1997**  
*Institution* : Uludağ University, Electronics Engineering Department  
*Title* : Instructor (Öğretim Görevlisi) for undergraduate courses

## ***Part Time***

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- Dates** : **August/2005 – Present**  
**Title** : Referee and Inspector for TÜBİTAK–TEYDEB projects from industry companies including ASELSAN, BEKO, KAREL, Sampaş, Telekurve, Pozitron, 23 projects refereed and 4 projects inspected (as of 11/2011)
- Dates** : **September/2008 - April/2009**  
**Institution** : İstanbul ULAŞIM A.Ş. (İstanbul Transportation Company)  
<http://www.istanbul-ulasim.com.tr/>  
**Title** : Consultant
- Dates** : **July/2006 – October/2006**  
**Institution** : BELBİM (İstanbul Municipalities Data Processing Industry & Trade Inc.,  
<http://www.belbim.com.tr> )  
**Title** : Consultant
- Dates** : **June/2004 – August/2008**  
**Institution** : KOSGEB Projects at Fatih University  
**Title** : Consultant and Referee
- Dates** : **August/2005 – March/2006**  
**Institution** : ISBAK (İstanbul Municipalities Transportation Maintenance Industries and Trade Inc., <http://www.isbak.com.tr/>)  
**Title** : Consultant
- Dates** : **January/2004 – February/2005**  
**Institution** : Europe Software  
**Title** : Consultant
- Dates** : **May/2003 – December/2003**  
**Institution** : BELBİM (İstanbul Municipalities Data Processing Industry & Trade Inc.,  
<http://www.belbim.com.tr> )  
**Title** : Consultant
- Dates** : **September/1997 – January/2002**  
**Institution** : Marmara University, Computer Engineering Department  
**Title** : Part-time instructor for graduate and undergraduate courses
- Dates** : **September/1995 – June/1997**  
**Institution** : ELKOSİS  
**Title** : Co-founder  
**Job Functions** : Software Projects Manager, System and Software Architect
- Dates** : **September/1992 – December/1995**  
**Institution** : TÜBİTAK – Marmara Research Center, Electronics Department  
**Title** : Consultant  
**Job Functions** : Software developer for DSP hardware environments and support for various software projects
- Dates** : **September /1987 – December /1989**  
**Institution** : University of Wisconsin-Madison, Electrical and Computer Eng. Dept.  
**Title** : A member of ‘Galaxy CAD Environment’ project group  
**Job Functions** : Software developer for Galaxy Hardware Description Language (GHDL) and GHDL CAD Tool

### 3. Education and Titles

- Prof.** : February/2009  
**Branch** : Computer Engineering
- Assoc. Prof.** : 24-11-1999  
**Branch** : Computer Engineering Sciences, Software Engineering
- Ph. D.** : September/1990 – July/1995  
**University** : Istanbul Technical University, Control and Computer Engineering Department, Istanbul, Turkey  
**Advisor** : Prof. Dr. Bülent Örencik  
**Thesis** : A Parallel Hardware and Software Architecture for Digital Signal Processing
- M.S.** : September/1987 – December/1989  
**University** : University of Wisconsin-Madison, Electrical and Computer Engineering Department, Wisconsin-Madison, USA  
**Advisor** : Dr. John F. Beetem  
**Thesis** : Galaxy Hardware Description Language
- B.S.** : September/1981 – December/1986  
**University** : Middle East Technical University, Electrical and Electronics Engineering Department, Ankara, Turkey  
: Middle East Technical University, English Preparation School (1981-1982)

### 4. Training

- Date** : 31 May – 3 June 2001  
**Name** : Strategic Management, Turkish Industry Orientation and Management Institute (TÜSSİDE), Gebze, Kocaeli
- Date** : 22 – 25 February 2001  
**Name** : Institution Culture and Basic Quality Concepts, Turkish Industry Orientation and Management Institute (TÜSSİDE), Gebze, Kocaeli
- Date** : 6 January 1987 – 22 April 1987  
**Name** : Intensive Course in English, University of Michigan, English Language Institute, Ann Arbor, Michigan, USA

## 5. Theses

### ***Ph. D. Thesis A Parallel Hardware and Software Architecture for Digital Signal Processing***

Istanbul Technical University, Control and Computer Engineering Dept.

Advisor: Prof. Dr. Bülent Örencik

September /1990 - July/1995

Dr. Gümüşkaya's Ph. D. thesis proposes a general hardware and software framework for the parallelization and implementation problems of a wide range of DSP algorithms for a parallel pipelined architecture which is suitable for the target algorithms. The proposed architecture is an SSIMD or MIMD machine depending on the algorithms implemented and the programming methodologies. The architecture and its six network configurations were partly implemented as an experimental DSP system, AdEPar (Advanced Educational Parallel), using printed circuit boards as processing elements based on TMS320C25 DSP processors. The two-dimensional block processing and DSP processors-based scheduling implementation techniques are proposed for atomic data flow graphs. The simulation and implementation blocks columnization scheduling technique for large grain data flow graphs is proposed. The concurrency in the proposed scheduling algorithms is both temporal and spatial concurrency. The third level of concurrency can be also achieved by using input and output synchronized circular buses. The AdEPar visual object-oriented DSP environment based on theoretical work presented in this thesis was developed to serve as a test bed for various scheduling, simulation and code generation problems.

### ***Master Thesis Galaxy Hardware Description Language***

University of Wisconsin-Madison, Electrical and Computer Eng. Dept.

Advisor: Dr. John F. Beetem

September/1987 – December/1989

Dr. Gümüşkaya, as part of his graduate study, developed a hardware description language, GHDL (Galaxy Hardware Description Language) of the Galaxy CAD Environment which was developed by Dr. Beetem and his students. Galaxy was developed especially for digital simulation and it was also the name of a high level programming language developed by Dr. Beetem. Digital circuits in the Galaxy CAD Environment are described as hierarchical by using Dr. Gümüşkaya's program. The output of the program is a file having circuit components and a netlist. The structure of this file is in the Galaxy common data structure representation form and can be used by other simulation programs in the Galaxy CAD Environment. The user describes signals and their timing for circuits by using another Galaxy program after describing his circuit by GHDL.

## 6. Areas of Interest

### Networking

1. Distributed systems, network programming, mobile and pervasive computing
2. Computer networking, mobile and wireless networking

### Software Engineering and Project Management

1. Object Oriented Analysis, Design and Programming techniques and processes, software development and project management processes
2. Frameworks and design patterns for communication systems and enterprise applications

### Hardware Engineering

1. Computer architecture, microprocessors/microcontrollers, electronics systems design and applications

### Previous Areas of Interest

1. Network management, management of crypto devices and network security (5/1999 – 8/2002)
2. Mobile agents (1998 – 2001)
3. Distributed software tools for collaborative work over Internet (1999)
4. Programming environments for DSP based hardware systems (1993 – 1997)
5. Digital signal processing applications using DSP processors (1993 – 1997)

## 7. Abilities Summary

<i>Teaching</i>	: Given courses in universities (1990 – present).
<i>Distributed Systems</i>	: Distributed Systems, Mobile and Pervasive Computing, Internet and Java technologies (1997 – present).
<i>Networking</i>	: Computer Networking, Mobile and Wireless Networking (1997–present).
<i>Software Engineering and Project Management</i>	: Object-Oriented Analysis, Design and Programming techniques using UML, Design Patterns and software development and management techniques and processes, Frameworks and Design Patterns for communication systems and enterprise applications (2000–Present).
<i>Network Management and Security</i>	: Network management protocols, standards, technologies, and platforms, fundamentals of network security (1997–Present).
<i>Microprocessors and Computers</i>	: Intel 80x86 family (8088/86–Pentium microprocessors), Intel 8051 microcontroller family, Intel 8085, IBM PC architecture, PC based data acquisition and control, Intel MCS96 family and 80C196KC, TMS 320C25/30 DSP processors, Transputer, Motorola 68000 and 6809, Z80.
<i>Programming Languages</i>	: Java (1997–present), C++ (1992–present), C (1987–present), Dephi (1995–1997), Occam (1991), Pascal (1988–97), Galaxy (1988–90), Ada (1988), Basic (1982–86), Fortran (1982–85).

## 8. Selected Presentations, Seminars and Conferences

1. "Proje Yönetimi", İGDAŞ, Genel Müdürlük, Alibeyköy, Mayıs 2010.
2. "Proje Yönetimi: Bilişim Teknolojileri AR-GE Proje Süreçleri ve Yönetimi", The Greenpark Kartepe Resort Hotel, Maşukiye-Kocaeli, İstanbul Ulaşım A. Ş., 2-4 Ocak 2009.
3. "A Software Solution for Mobile Context Handoff in WLANs", *Fourth International Conference on Telecommunications and Networking (TeNe 08)*, Live Internet Presentation, 5-13 December 2008.
4. "Service-Oriented Context-Awareness and Context-Aware Services", *Third International Conference on Systems, Computing Sciences and Software Engineering (SCSS2007)*, Live Internet Presentation, 8 December 2007.
5. "Frameworks for Context-Aware Pervasive Systems (FCAPSYS)", The First Research and Project Marketplace, *Fatih University*, İstanbul, 14 June 2007.
6. "Pervasive Computing is Coming and Its Foundation Technologies: Wireless Networks and Mobile Computing", presented, *Fatih University*, İstanbul, 9 May 2007.
7. "An Architecture Design Process Using a Supportable Meta-Architecture and Roundtrip Engineering", presented, *Advances in Information Systems (ADVIS 2006)*, İzmir, October 2006.
8. "Object Oriented Analysis, Design and Programming" seminars and presentations, İstanbul, ISBAK, August/2005 – March/2006.
9. "WiPoD Wireless Positioning System Based on 802.11 WLAN Infrastructure", presented, *ESSE 2005: International Conference on Enformatika, Systems Sciences and Engineering*, İstanbul, November 2005.
10. "Core Issues Affecting Software Architecture in Enterprise Projects", presented, *ESSE 2005: International Conference on Enformatika, Systems Sciences and Engineering*, İstanbul, November 2005.
11. "Introduction to Modeling, Model Driven Architecture and Development", Europe Software-ÜLKER, İstanbul, May/2004.
12. "Introduction to UML", Europe Software-ÜLKER, İstanbul, May/2004.
13. "Project and Software Process Improvement" seminars and presentations, İstanbul, BELBİM, May-December, 2003.
14. *IEEE/IFIP International Symposium on Integrated Network Management and Microsoft Technical Visit and Research*, Seattle, WA-USA, 12-19 May-2001.
15. "Software Process Improvement" presentations (more than 500 slides), TÜBİTAK-UEKAE, Gebze, Kocaeli, September 2000 - January 2001.
16. *Managing IP QoS Conference*, Paris La Defense, France, 12-15 September 2000.
17. "Management System for Crypto Equipment" presented, *NATO INFOSEC SC-4 Meeting*, Antalya, 8-12 Mayıs 2000.
18. "Management System for Crypto Equipment" presented, *NATO Unified Efforts 2000*, Ankara, April 2000.
19. "Network Management" presented, TSK Genel Kurmay, Ankara. January 2000.

## 9. Projects

6/2005 – Present

### ***Research Projects at the Networking and Software Engineering (NetSE) Lab Researcher***

The NetSELab research team's projects span networking, distributed systems, mobile and wireless systems, pervasive computing, new networking paradigms, and software engineering.

9/2008 – 9/2010

### ***Design, Implementation and Performance Analysis of High Performance Telerobotic Systems Using Real Time Communication Protocols on Wireless Networks, TÜBİTAK, EEEAG 108E091***

*Researcher (with Dr. Onur Toker, Project Manager)*

The main goal of this project was to design, implement and performance analysis of high performance telerobotic system architectures using real time communication protocols on wireless networks.

Telerobotics can be defined as the control of robot arms from a remote location. In a telerobotic system, there is a robot arm to be controlled which is identified as the "slave arm", and a remote operator at a distant location using a robotic manipulator which is called the "master arm". In control system measurements actuator delays do degrade system performance. Therefore, communication delays between the master and slave arms and their minimization are of extreme importance in telerobotics.

We first developed a new wireless communication protocol, Lightweight Wireless Protocol (LWP), designed on top the 802.11 MAC layer. This low-delay wireless LWP protocol was implemented on an embedded system (Airdrop-LWP) without an operating system and its associated overhead. Finally, two Airdrop-LWP embedded systems running this low-delay wireless LWP protocol were used to build a telerobotic system with a Mitsubishi RV-2AJ industrial robot. The LWP protocol was also tested on a robot car controlled by an AirDrop-LWP card as a slave arm and a standard PC as a master arm. The key features of LWP are reduced packet size, simple protocol stack, predictive compression of operator movements, and prediction of lost data packets. The LWP protocol was compared with TCP/IP suite of protocols, and when compared with UDP significant performance improvements are observed: Up to 50% reduced delay, and an additional 20% lower delay via compression. Variation in packet delay times is also an important parameter for the wireless control system. As the standard deviation of packet delay times increase, and become less and less predictable, the resulting telerobotic system will be more and more difficult to operate. We measured the standard deviation of packet delays, and observed that it increases with the packet size, and this increase is faster than the increase in mean packet delay.

9/2008 – 4/2009

### ***National Railway Signalling Solutions for İstanbul Urban Rail Transportation Systems***

***İstanbul ULAŞIM A.Ş. (Istanbul Transportation Company)***

*Consultant*

Railway Signalling is a complex and fascinating research and development area in railways. The purpose of a signalling system is to facilitate the safe and efficient movement of trains on the railway. Two major worldwide markets in railways are Main Line Railways and Urban Rail Transportation Systems (Metro, LRT (Light Rail Transit), Tramway). This project investigates all aspects of railway signalling systems for İstanbul Urban Rail Systems to design and develop national signalling solutions. The initial target of the project is to build the research and development infrastructure (signalling literature and information infrastructure, railway signalling lab, development team, team processes and dynamics, ...) and to produce the first road map, some technical blue prints,

requirements analysis and system architecture design documents, and railway signalling simulator programs.

**6/2007 – 6/2008**

***Frameworks for Context-Aware Pervasive Systems (FCAPSYS)  
Fatih University-Research Fund Project, P50050702***

*Project Manager*

In this project, some frameworks for a context-aware system over pervasive wireless networks were developed for a university campus. The basic aim was the development of a real-time distributed system architecture, based on novel protocols and applications targeted for indoor and outdoor context-aware computing. In this project, we explored new ways of enabling and exploiting new pervasive wireless connectivity and positioning solutions for a university campus. The pervasive wireless networks were constructed with small wireless devices, real-time indoor and outdoor location-infrastructures such as 802.11 access points and GPS (Global Positioning System). GPS gives the outdoor position information for mobile users having GPS-enabled handheld Pocket PCs. The 802.11 infrastructure, besides wireless network access, was also used for finding locations of mobile users in the campus area.

**6/2004 – 6/2008**

***KOSGEB Projects at Fatih University***

*Consultant*

- Birinci Bilgi Sistemleri, Printing House Management System Automation, 12/2005 – 4/2006
- Nilacra, Design and Development of a Framework for ERP, 9/2004 – 3/2005
- Pozitron, Fax Automation, 6/2004 – 10/2004

**7/2006 – 10/2006**

***BELBİM (Istanbul Municipalities Data Processing Industry and Trade Inc.)***

*Consultant*

Consultancy on project management, administrative and technical management processes. Organization structure and processes, development team models, software development and project management processes, standards and documents.

**8/2005 – 3/2006**

***New Generation Microprocessor-Based Traffic Junction Control Unit  
ISBAK (Istanbul Municipalities Transportation Maintenance Industries and Trade Inc.)***

*Consultant*

He worked on the design, and processor and software tools selection problems for a new generation microprocessor-based traffic junction control unit which would replace old PLC-based control units in Istanbul. The following processor families and their development tools were studied and evaluated for the target control unit design: Ubicom 2K and 3K processors, Dallas TINI Chip Set and ARM processors. He also gave lectures on object-oriented analysis, design, and programming using Java and UML.

**4/2005 – 8/2005**

***Design and Foundation of a Network Lab  
Fatih University, Department of Computer Engineering***

*Founder*

Founded the first hardware lab in the Department of Computer Engineering at Fatih University. The Network Lab has two main labs: Computer Networks Lab and Wireless Networks Lab. The Network Lab is mainly for undergraduate students but it is also used for some advanced network research studies by graduate students and researchers. This is the first university network lab in its class in Turkey.

The Computer Networks Lab is a miniature version of the Internet. The available equipment is sufficient to emulate many traffic scenarios found on the real

Internet and to teach TCP/IP protocols and data communication to students, and to give them hands-on experience on networking. The lab has modular Internet rack equipment. Each rack has 4 Cisco 2811 Integrated Services Routers, a 24-port 3Com (or CISCO) switch, 4 computers as internet hosts in experiments, 4 Ethernet hubs, 1 KVM switch and its set (LCD monitor, keyboard, and mouse), cables and connectors. There are also 4 Internet computers with each rack equipment unit. One set of rack equipment is used by 4 students in lab experiments. There are 6 racks in the lab; and since the design of the lab is modular and scalable, it can be easily extended if it is needed in the future.

The Wireless Networks Lab has 2 Internet racks, 8 Internet computers, 3 notebooks, indoor and outdoor Access Points (such as Cisco Aironet 1100) and antennas, an ADSL network connection and an USRobotics ADSL wireless modem supporting 802.11 abg/n, mobile devices supporting GSM, GPRS, EGDE, UMTS, GPS, 802.11abg/n and Bluetooth wireless technologies. Some of the mobile devices: Pocket PCs (IPAQs, hw6515, hw6915, h6340), Asus MyPal A636N, smart mobile phones (2 SonyEricsson P990), Sensors Networks Teaching Lab Equipment (Crossbow Mote Sensor Kits), Dallas DS80C400 (DSTINIm400) Networked Microcontroller Evaluation Kits, wireless development kits ...

**1/2004–2/2005**

***Enterprise Resource Planning (ERP) Projects  
Europe Software-ÜLKER***

*Consultant and mentor on organization structure and processes, technologies, project management and software development processes, enterprise system architectures*

He made contributions to the following main areas for a new start-up company from the beginning: Organization structure and processes, interviews, technologies and tools, team models, software life cycle activities, software development and project management processes, standards and documents.

Consultancy on Enterprise and ERP applications such as Supply Chain Management, Human Resources and Product Management, and Banking applications. The following were the general problems in these applications: How to layer an enterprise application, how to organize domain logic (i.e.: Security Layer, Service Layer, Data Model), how to tie that logic to a relational database, how to design a web based presentation, decisions in distributed design, and handling transactions. JSF, Hibernate, and Spring Framework are some of the new technologies used at Europe Software.

**5/2003–12/2003**

***Automatic Sales Machine and Ticket Sales Machine Projects - BELBİM  
(Istanbul Municipalities Data Processing Industry and Trade Inc.)***

*Consultant and mentor for system architecture, technologies and software development processes*

The AKBİL (Smart Ticket) System developed by BELBİM for public transportation is the biggest *integrated* electronic ticket system in the world. It has become possible for 2.500.000 habitants of Istanbul to travel with only one single ticket in 15 separate organizations and 19 kinds of different vehicles. This project was entirely designed and produced by Turkish engineers without getting any loan and know-how.

This is a reengineering project which re-designs and re-implements the existing *Automatic Sales Machine (ASM)* and *Ticket Sales Machine (TSM)* parts of the AKBİL system using Java technologies, new development tools and processes. These two systems are basically ticket loading systems and do the similar jobs. The ASM has no sales person; it uses a banknote acceptor to get the user's cache, whereas the TSM is used by a sales officer and has many complicated

operations for ticket loading.

The ASM system has a personal computer (PC), a banknote acceptor (BNA), a TOM (Touch On Memory) Read/Write circuit, a monitor, a Vacuum Fluorescent Display (VFD), a printer, other hardware components and a power supply. The BNA, TOM R/W circuit, and VFD are connected to the serial ports of the PC. The TSM system has all these hardware components except BNA.

The analysis, design, and implementation of the new system were started and completed using UML and an agile software development process. The Java programming language and Borland JBuilder development platform were used in the implementation. The Borland Together was used as the UML modeling and documentation tool.

**5/2003 –12/2003**

***Data Transfer and Automatic Integration Projects - BELBİM (Istanbul Municipalities Data Processing Industry and Trade Inc.)***

*Consultant and mentor for system architecture, technologies and software development processes*

The AKBİL data (like sales reports) produced by many different vehicles in Istanbul transportation are collected by modems and processed at the BELBİM Data Processing Center every day. The statistical and financial reports are produced and sent to many organizations of Istanbul at a daily basis.

The data transfer program basically gets and writes *raw reports* (files collected by modems from different sources) to database tables and related directories on the file servers according to their file types. The automatic integration program reads preprocessed files from their directories and start further processing and database operations.

These two projects are reengineering projects which re-design and re-implement the existing data transfer and file processing units of the AKBİL system using new technologies, development tools and processes. The analysis, design, and implementation of the new systems were started and completed using UML and an agile software development process. The C# programming language, Visual Studio.NET development platform, and MS SQL Server were used in the implementation. The Borland Together was used as the UML modeling and documentation tool.

**5/1999 – 7/2002**

***IP Crypto Devices Management System, TÜBİTAK-UEKAE***

*Project manager, system architect*

A management center and special agent software for IP crypto devices were designed and developed. These devices are the products of the National Research Institute of Electronics and Cryptology and used to form VPNs (Virtual Private Network). The management center software is based on Java RMI technology and runs on the HP OpenView network management platform. The management agent was developed using the C programming language. The communication between the management center and the crypto devices is performed by SNMP messages. The five management functions of network management (Fault, Configuration, Account(Asset), Performance and Security (FCAPS) management) were implemented for IP crypto devices.

Dr. Gümüşkaya was the chief software architect on network management and Java network programming technologies. He also made some contributions to the representation of Turkey in the NATO INFOSEC Working Group during this project.

**8/2000 –12/2001**

***Institute and Project Management Processes Improvement  
TÜBİTAK-UEKAE***

*Working in various institute process improvement teams as project manager*

Research on administrative and technical management processes which would be applied in an R&D institution, active participation to UEKAE process improvement meetings, preparation long presentations and process documents which would be used in the institute. In this scope, research studies were conducted on various software development and project management processes, starting from CMM, IEEE, SPICE, and present new “agile” methodologies like XP (Extreme Programming). Some processes and documents which could be used especially in software projects were produced.

**5/1997 – 5/1999**

***TAFICS (Turkish Armed Forces Integrated Communication System)  
Electronic Key Management System (TELAYS), TÜBİTAK-UEKAE***

*Project member, system architect*

In this project, TCP sockets-based large distributed network software which run on a Turkish military TCP/IP network having SUN Enterprise/Ultra Solaris/UNIX and PC Windows NT computers in a large geographical area in Turkey was developed by a very large project team. This is the first large software development project in many aspects in Turkey. The main system at the crypto key production and distribution center was build on top of Java and SDL technologies. This system produces electronic keys and distributes these keys to the remote crypto equipment on the wide area network in Turkey. Dr. Gümüşkaya was the chief software architect on Java network programming technologies. This project lasted about 7 years and employed hundreds of software and hardware developers.

**1995 – 1997**

***Electronic Electricity Meter, ELKOSİS-Federal Elektrik***

*Co-founder, software projects manager*

In this project, a new electronic electricity meter device prototype having prepayment feature with its smart card and its PC program were developed for Federal Elektrik for the Turkish market. The design and the development of the electricity meter requirements and analysis of existing systems in terms of hardware and software solutions were performed. The TI MSP 430 based hardware including current and voltage sensors, infrared communication, smart card interface, keyboard, LCD display were implemented. A Windows GUI application and a database program were developed using Delphi and Interbase for electricity meter user accounts and operations. The user and electricity usage information which were entered on the PC was downloaded to the smart card via a smart card interface circuit designed for the PC. The meter worked with this card.

**1994 – 1995**

***AdEPar (Advanced Educational Parallel) DSP Software Environment,  
Uludağ University, Electronic Engineering Department***

*System architect, software engineer*

Dr. Gümüşkaya, as part of his Ph. D. study, developed a block diagram based object oriented Digital Signal Processing (DSP) software environment using Borland 3.1 OWL (Object Windows Library). The DSP algorithms which are in the form of LGDF (Large Grain Data Flow) graphs or ADF (Atomic Data Flow) graphs (digital filters) could be described in this environment. The algorithms are simulated using the program. The program distributes the tasks of a real-time DSP algorithm graph to the processing elements and generates a parallel C or assembly code for the target TMS320C25 processors.

**1993 – 1994**

***Parallel Hardware Debugger for a Dual Processor Based DSP Architecture  
for Real-Time Control and Digital Signal Processing Applications, Uludağ  
University, Electronic Engineering Department - TÜBİTAK-MAM Electronic  
Department***

*System architect, software engineer*

In this project, a hardware debugger program was developed using the Borland 3.1 Turbo Vision C++ objects for the dual-processor parallel DSP (TMS32C25) system which was designed and produced at the Electronics Department of the Scientific and Technical Research Council of Turkey-Marmara Research Center (TÜBİTAK-MAM).

**1993 – 1994**

***TÜBİTAK-MAM Marmara Research Center, Electronic Department, Gebze Consultant***

Various projects on hardware and software engineering, digital signal/image processing. Different microprocessors, microcontrollers, special purpose processors like TMS 320C25/30 DSP processors, PC data acquisition and I/O boards were designed, constructed and used in various projects. C/C++ and assembly languages were used. The projects were for mostly academic purposes, and resulted in journal and conference papers.

**1990 – 1995**

***Foundation of an Electronics Research Lab and a Research Team  
Uludağ University, Department of Electronic Engineering  
Founder***

Lisans ve lisans üstü öğrencileri için BilDET (Bilgisayar Destekli Elektronik Tasarım) laboratuvarını ve öğrenci araştırma grubunu kurmuştur. BilDET öğrencileri, ulusal projelerde ödüller kazanma, yurtdışı doktora sınavlarını ve araştırma görevlilikleri kazanma, yüksek teknoloji üreten firmalarda iş bulma gibi başarılar kazanmışlardır. BilDET çalışmalarından bir kısmının bazı ulusal ve uluslararası akademik yayınlara da katkısı olmuştur.

BilDET öğrencilerinin, TÜBİTAK üniversiteler arası proje yarışması mühendislik dalında almış oldukları ödüller şunlardır: 1990'da teşvik ödülü, 1991'de ikincilik, 1992'de birincilik ve 1993 yılında da proje maddi destek ödülü kazanmışlardır. Ayrıca, Mühendislik ve Mimarlık Fakültesinde düzenlenen bir törende, özel ödüller de almışlardır. 1994 yılında, bir öğrencisi, Dr. Gümüşkaya'nın katkılarıyla geliştirmiş olduğu Windows altında çalışan bir elektronik devre simülasyon programı ile, PC World dergisi büyük ödülünü kazanıp Amerika'da Seattle eyaletinde Microsoft firmasının tesislerini gezme ve tatil ile ödüllendirilmiştir. Bu laboratuvar 1995 yılında bölümdeki bir Profesör tarafından kapatılmıştır...

**1992-6 months**

***Intel 196KC Microcontroller Based Electric Winding Machine,  
Uludağ University, Electronic Engineering Department – MİSTAŞ A.Ş.  
System architect, software engineer***

An electronic winding machine control unit was developed with a joint work of the Electronics Department of Uludağ University and MİSTAŞ A.Ş in Bursa. In the project, the 16-bit Intel 196KC microcontroller was used as the main processor in the control unit.

**1987 – 1989**

***Galaxy Hardware Description Language  
University of Wisconsin-Madison, Electrical and Computer Eng. Dept.  
Software engineer***

The Galaxy Hardware Description Language developed by Dr. Gümüşkaya as part of his master study become a commercial product and was used in the University of Wisconsin and in many universities of USA. Some more information on this work is given at the Master Thesis section of this document.

## 10. Scholarship and Rewards

<i>Date</i>	January/1987 – January/1990 (3 years)
<i>Subject</i>	Full scholarship for graduate education in USA, National Ministry of Education of Turkey
<i>Publication</i>	
<i>Rewards</i>	Reward for National Book Pub. No. 2, Fatih University, 17/12/2007 Reward for National Book Pub. No. 3, Fatih University, 17/12/2007 Reward for Int. Pub., Fatih University, 28/08/2007 Reward for Int. Pub., TÜBİTAK, 9/02/2007 Reward for Int. Pub., TÜBİTAK, 9/02/2007 Reward for Int. Pub., Fatih University, 24/01/2007 Reward for Int. Pub., TÜBİTAK, 01/02/1998 Reward for Int. Pub., TÜBİTAK, 01/09/1995

## 11. Publications

### 11.1. Books

1. *Java Ağ Programcılığı, (Ömer Boyacı ile)*, 720 sayfa, 1. Baskı: Haziran 2003, ALFA.
2. *Mikroişlemciler ve Bilgisayarlar, Intel Ailesi ve IBM PC*, 430 sayfa, 6. Baskı: Ekim 2011, 1. Baskı: Eylül 1999, ALFA.
3. *Mikroişlemciler ve 8051 Ailesi Donanım, Programlama ve Uygulamalar*, 345 sayfa, 6. Baskı: Ekim 2007, 1. Baskı: Şubat 1998, ALFA.
4. *Network Programming with Java (Lecture Notes)*, Marmara University, Computer Engineering Department, 493 pages, 1999.
5. *The Galaxy CAD System, Chapter 5: Galaxy Hardware Description Language (GHDL)*, J. F. Beetem, Jim Rose, H. Gümüşkaya, et. al., Electrical and Computer Engineering, University of Wisconsin-Madison, USA, December 1991.
6. *Lojik Devre Temelleri*, 150 sayfa, Uludağ Üniversitesi, 1990.

### 11.2. Book Chapters

(Publications appear in SCI, SCI-Exp. are shown with \*. Other indexed publications are shown with + )

1. + U. Şimşek, H. Gümüşkaya, "Using PRINCE2 Project Management Methodology to Develop SOA Based Applications", *Innovations in Computing Sciences and Software Engineering*, Springer, 2011.
2. + H. Gümüşkaya, M. V. Nural, S. Doğan, "A Software Solution for Mobile Context Handoff in WLANs", *Novel Algorithms and Techniques in Telecommunications and Networking*, Springer, pp. 305 – 309, January 2010.
3. + H. Gümüşkaya, M. V. Nural, "Service-Oriented Context-Awareness and Context-Aware Services", *Advances in Computer and Information Sciences and Engineering*, Springer, pp. 184 – 189, August 2008.
4. + B. Yurday, H. Gümüşkaya, "A Service Oriented Reflective Wireless Middleware", *Lecture Notes in Computer Science*, vol. 4294, pp. 545 – 556, 2006.
5. \* H. Gümüşkaya, "An Architecture Design Process Using a Supportable Meta-Architecture and Roundtrip Engineering", *Lecture Notes in Computer Science*, vol. 4243, pp. 324-333, 2006.
6. + A. Atik, H. Gümüşkaya, Ö. Genç, S. Kazancı, "Java Mobile Agent System", *Advances in Computer and Information Sciences'98, Concurrent Systems Engineering Series*, Volume 53, IOS Press, October 1998, pp. 490-497, ISBN: 90-5199-405-2.

### 11.3. Journal Publications

(Publications appear in SCI, SCI-Exp. are shown with \*. Other indexed publications are shown with + )

1. \* O. Toker, H. Gümüşkaya, C. Ulaş, B. T. Yılmaz, “Lightweight Wireless Protocol Based on IEEE 802.11 for Delay Sensitive Telerobotic Systems”, Submitted
2. \* O. Karan, C. Bayraktar, H. Gümüşkaya, B. Karlık, “Diagnosing Diabetes using Neural Networks on Small Mobile Devices”, *Expert Systems with Applications*, Elsevier, Vol. 39, Issue 1, 2012, pp. 54-60, 2012.
3. + D. Akbaş, H. Gümüşkaya, “Real and OPNET Modeling and Analysis of an Enterprise Network and Its Security Structures”, *Procedia Computer Science*, Elsevier, Volume 3, p.p. 1038-1042, 2011.
4. + Ö. Önder, H. Gümüşkaya, “Architectural Platform: A Social Network Site for Architects”, *Procedia Computer Science*, Elsevier, Volume 3, p.p. 469-473, 2011.
5. + C. Bayraktar, O. Karan, H. Gümüşkaya, “Diagnosing Internal Illnesses using Neural Networks and Pervasive Healthcare Computing”, *Procedia Computer Science*, Elsevier, Volume 3, p.p. 584-588, 2011.
6. + C. Ulaş, H. S. Efendioğlu, O. Toker, H. Gümüşkaya, “Delay Sensitive Wireless Protocols for Telerobotics Applications”, *Journal of Networking Technology*, Vol. 1, No. 3, pp. 118-125, Sep. 2010.
7. + H. Gümüşkaya, H. Hakkoymaz, “WiPoD Wireless Positioning System Based on 802.11 WLAN Infrastructure”, *Enformatika*, Vol. 9, pp. 126-130, November, 2005.
8. + H. Gümüşkaya, “Core Issues Affecting Software Architecture in Enterprise Projects”, *Enformatika*, Vol. 9, pp. 32-37, November, 2005.
9. + H. Gümüşkaya, Y. Ulcay, “Development of a LAN System for Textile Computer Integrated Manufacturing”, *University of Uludağ Journal of the Faculty of Engineering and Architecture*, Vol. 8, No. 1, pp. 45-51, 2003.
10. + H. Gümüşkaya, B. Örencik, “A Parallel Pipelined Computer Architecture for Digital Signal Processing”, *Elektrik, (Turkish Journal of Electrical Engineering & Computer Sciences)*, Vol. 6 No. 2, pp. 107-129, 1998.
11. \* H. Gümüşkaya, B. Örencik, “AdEPar Integrated Simulation and Implementation Environment for DSP”, *Simulation*, Vol. 69, No: 6, pp. 335-349, December 1997.
12. + H. Gümüşkaya, B. Örencik, “The Design of a Block Diagram Based Object-Oriented Graphical User Interface for a DSP Environment”, *The Journal of İstanbul Technical University*, Vol. 49, pp. 441-457, 1996.
13. \* F. Kurugöllü, H. Palaz, H. Gümüşkaya, E. Harmancı, B. Örencik, “Advanced Educational Parallel DSP System Based on TMS320C25 Processors”, *Microprocessors and Microsystems*, pp. 147-156, April, 1995.

### 11.4. Conference Publications and Presentations

1. B. T. Yılmaz, H. Gümüşkaya, O. Toker, “A Lightweight Wireless Protocol Based on IEEE 802.11 for Embedded Telerobotics Systems”, *2nd International Symposium on Computing in Science and Engineering (ISCSE)*, Kuşadası, Aydın, June, 1-4, 2011.
2. U. Şimşek, H. Gümüşkaya, “Using PRINCE2 Project Management Methodology to Develop SOA Based Applications”, *2010 International Joint Conferences on Computer, Information, and Systems Sciences, and Engineering*, December 3 - 12, 2010.
3. C. Bayraktar, O. Karan, H. Gümüşkaya, B. Karlık, “Diyabet Hastalığının Teşhisinde Yaygın Hesaplamanın ve Yapay Sinir Ağlarının Kullanılması”, *ELECO'2010, Elektrik Elektronik Bilgisayar Mühendisliği Sempozyumu*, Bursa, 2-6 Aralık 2010.
4. D. Akbaş, H. Gümüşkaya, “Bir Kurumsal Ağın ve Güvenlik Yapılarının Modellenmesi”, *ELECO'2010, Elektrik Elektronik Bilgisayar Mühendisliği Sempozyumu*, Bursa, 2-6 Aralık 2010.

5. D. Akbaş, H. Gümüşkaya, "Real and OPNET Modeling and Analysis of an Enterprise Network and Its Security Structures", *World Conference on Information Technology*, Istanbul, 06-10 October 2010.
6. Ö. Önder, H. Gümüşkaya, "Architectural Platform: A Social Network Site for Architects", *Procedia Computer Science*, Elsevier, *World Conference on Information Technology*, Istanbul, 06-10 October 2010.
7. C. Bayraktar, O. Karan, H. Gümüşkaya, "Diagnosing Internal Illnesses using Neural Networks and Pervasive Healthcare Computing", *World Conference on Information Technology*, Istanbul, 06-10 October 2010.
8. C. Ulaş, H. S. Efendioğlu, O. Toker, H. Gümüşkaya, "Delay Sensitive Wireless Protocols for Telerobotics Applications", *The Third International Conference on the Applications of Digital Information and Web Technologies (ICADIWT 2010)*, pp. 10-16, İstanbul, Turkey, July 12-14, 2010.
9. O. Karan, C. Bayraktar, H. Gümüşkaya, B. Karlık, "Diagnosing Illnesses using Neural Networks and Pervasive Healthcare Computing", *1st International Symposium on Computing in Science and Engineering (ISCSE)*, Kuşadası, Aydın, June, 3-5, 2010.
10. O. Toker, C. Ulaş, H. S. Efendioğlu, H. Gümüşkaya, "Embedded Systems for Delay Sensitive Wireless Protocol Development and Analysis for Telerobotics Applications", *Int. Conf. on Wireless Networks 2009 (ICWN'09)*, Las Vegas, NV, U.S.A., Jul. 2009.
11. H. Gümüşkaya, M. V. Nural, S. Doğan, "A Software Solution for Mobile Context Handoff in WLANs", *Fourth International Conference on Telecommunications and Networking (TeNe 08)*, 5-13 December 2008.
12. H. Gümüşkaya, A. V. Gürel, M. V. Nural, "Ortamdan-Haberdar Bir Sistem İçin Mobil Ağ Yazılım Mimarileri", *2. Ulusal Yazılım Mimarisi Konferansı (UYMK 2008)*, Ege Üniversitesi, İzmir, 11-12 Eylül 2008.
13. H. Gümüşkaya, A. V. Gürel, M. V. Nural, "Küçük Mobil Cihazlarda Kablosuz Ağlar Üzerinde SOAP, RMI ve TCP Performans Analizi", *2. Ulusal Yazılım Mimarisi Konferansı (UYMK 2008)*, Ege Üniversitesi, İzmir, 11-12 Eylül 2008.
14. H. Gümüşkaya, A. V. Gürel, M. V. Nural, "Architectures for Small Mobile Communication Devices and Performance Analyses", *First IEEE International Conference on the Applications of Digital Information and Web Technologies*, Ostrava, Czech Republic, 4-6 August 2008.
15. H. Gümüşkaya, M. V. Nural, "Service-Oriented Context-Awareness and Context-Aware Services", *Third International Conference on Systems, Computing Sciences and Software Engineering (SCSS2007)*, 3-12 December, Live Internet Presentation, 2007.
16. M. Bilgi, H. Gümüşkaya, "Design Issues for Supportable Enterprise Web Architecture using Frameworks", *Turkish Software Architecture Design Workshop (TSAD)*, September 24, 2005, ODTÜ Kültür ve Kongre Merkezi, Ankara.
17. O. Davulcu, H. Gümüşkaya, "A Secure Mobile Agent Architecture for E-Commerce Applications", *International Symposium on Computer and Information Sciences XVI (ISCIS'16)*, pp. 336-343, November 5-7, 2001, Antalya.
18. İ. Levent, H. Gümüşkaya, "Distributed Project Management with Java Mobile Agents on the Web", *International Symposium on Computer and Information Sciences XV (ISCIS'15)*, Oct., 11-13, 2000, İstanbul.
19. İ. Levent, H. Gümüşkaya, "Distributed Project Management Using Mobile Agents", *Bilişim 2000*, 6-9 Eylül 2000, İstanbul.
20. O. Adalier, H. Gümüşkaya, "Centralized Policy-Based Management of VPN Devices Using SNMPv3", *5th Computer Networks Symposium (BAS2000)*, pp. 113-121, Ankara, Bilkent University, 15-16 Haziran 2000.
21. O. Adalier, H. Gümüşkaya, A. Kaşlı, "IP Tabanlı Sanal Özel Ağlarda SNMPv3 ile Anahtar Yönetimi", *IEEE 2000 Sinyal İşleme ve Uygulamaları Kurultayı (IEEE SİU'2000)*, Sayfa: 233-238, Antalya, Belek,

12-14 Haziran 2000.

22. H. Gümüşkaya, O. Davulcu, E. Akbaş, T. Dursun, "A CORBA and Java Mobile Agents Based Network Management Architecture", *International Symposium on Computer and Information Sciences XIV (ISCIS'14)*, pp. 975-982, October 18-20, 1999, Kuşadası, İzmir.
23. H. Gümüşkaya, E. Akbaş, T. Dursun, O. Davulcu, "Utilization of CORBA, Mobile Agents, Java, and Web Technologies for Network Management", *Regional Conference on Military Communication and Information Systems'99*, Vol. 3, pp. 25-34, Oct. 6-8, 1999, Zegrze, Poland.
24. H. Gümüşkaya, T. Dursun, H. Er, "A Mobile Multi-Agent System Architecture for Intelligent Information Retrieval on the Web", *8<sup>th</sup> Turkish Symposium on Artificial Intelligence and Neural Networks (TAINN'99)*, June 23-25, 1999, Boğaziçi University, İstanbul.
25. H. Gümüşkaya, S. Çetin, "Sinyal ve Görüntü İşleme İçin Web ve Java Tabanlı Bir Mimari", *IEEE 1999 Sinyal İşleme ve Uygulamaları Kurultayı (IEEE SİU' 99)*, Sayfa: 493-498, 16-19 Haziran 1999, Bilkent, Ankara.
26. H. Gümüşkaya, Ü. Şair, G. Çiftçi, "An Infrastructure for Collaborative Distance Education Over Internet", *The Fourth Turkish Symposium on Computer Networks (BAS'99)*, May 20-21, 1999, Istanbul Technical University, İstanbul.
27. T. Dursun, H. Gümüşkaya, "A Java Mobile Agents Based Network Management Architecture", *The Fourth Turkish Symposium on Computer Networks (BAS'99)*, May 20-21, 1999, İTÜ, İstanbul.
28. H. Gümüşkaya, Y. Ulçay, "Tekstil Dokuma İşlemleri için bir LAN ve Barkodlu Üretim Takip Sisteminin Geliştirilmesi", *Elektrik-Elektronik-Bilgisayar Mühendisliği 7. Ulusal Kongresi*, 31 Ağustos - 6 Eylül 1997, Ankara.
29. A. Babaev, H. Gümüşkaya, Y. Ulçay, "Development of an Expert System for Diagnosis of Textile Fabric Defects", *6th Turkish Symposium on Artificial Intelligence and Neural Networks (TAINN'97)*, May 21-23, 1997, Ankara.
30. H. Gümüşkaya, C. Z. Tan, B. Örencik, "Bir Paralel Bilgisayar Mimarisinde DSP Uygulamalarının Başarım Analizi", *5. Sinyal İşleme ve Uygulamaları Kurultayı (SİU'97)*, 1-3 Mayıs 1997, Sayfa: 667-672, Kuşadası, İzmir.
31. H. Gümüşkaya, B. Örencik, "Sayısal İşaret İşleme için bir Donanım ve Yazılım Ortamı", *4. Sinyal İşleme ve Uygulamaları Kurultayı*, Sayfa: 337-342, 5-6 Nisan 1996, Kemer, Antalya.
32. H. Gümüşkaya, B. Örencik, "ADF Grafları ile Tanımlı Gerçek-Zaman Süzgeçleri için Paralel Mimariler ve Otomatik Program Üretimi", *4. Sinyal İşleme ve Uygulamaları Kurultayı (SİU'96)*, Sayfa: 343-348, 5-6 Nisan 1996, Kemer, Antalya.
33. H. Gümüşkaya, B. Örencik, "Networks Analysis and Comparison of a Parallel Pipelined Architecture for DSP", *International Symposium on Computer and Information Sciences X (ISCIS'10)*, Vol 2, pp. 621-628, October 30-November 1, 1995, Kuşadası, İzmir.
34. H. Gümüşkaya, B. Örencik, "Sayısal İşaret İşleme için Paralel Mimariler", *3. Sinyal İşleme ve Uygulamaları Kurultayı*, Cilt B, Sayfa:291-296, 26-28 Nisan 1995, Kapadokya, Nevşehir.
35. D. Demir, İ. Avcıbaş, H. Gümüşkaya, E. Dilaveroğlu, "Nesneye Yönelik Bilgisayarla Görü Ortamı (MAMGÖR)", *3. Sinyal İşleme ve Uygulamaları Kurultayı (SİU'95)*, Cilt A, Sayfa: 216-221, 26-28 Nisan 1995, Kapadokya, Nevşehir.
36. H. Gümüşkaya, B. Örencik, F. Kurugöllü, H. Palaz, "Automatic Scheduling of Real-Time Digital Filtering Algorithms onto Processors", *5th Int. Conference on Signal Processing Applications and Technology*, Vol.1, pp. 606-611, Oct. 18-21,1994, Dallas, Texas, USA.
37. H. Gümüşkaya, H. Palaz, F. Kurugöllü, B. Örencik, "Practical Scheduling of Real-Time Digital Filtering Algorithms onto Multiprocessors", *Euromicro 94*, Sep. 5-8, 1994, Liverpool, England.
38. H. Gümüşkaya, B. Örencik, A. Akman, "Blok Diyagram Tanımlamalı ve Asenkron Veri Akışı Tabanlı bir Sayısal İşaret İşleme Ortamı", *2. Sinyal İşleme ve Uygulamaları Kurultayı (SİU'94)*, Sayfa: 276-281, 8-9 Nisan 1994, Gökova, Muğla.

39. İ. Avcıbaş, H. Gümüşkaya, D. Demir, B. Sankur, E. Anarım, “Nesneye Yönelik Alt Düzeyde Bilgisayarla Görme Ortamı”, 2. *Sinyal İşleme ve Uygulamaları Kurultayı (SİU’94)*, Sayfa: 59-64, 8-9 Nisan 1994, Gökova, Muğla.
40. H. Gümüşkaya, Y. Bacak, “Sayısal İşaret İşlemcilerin Yeni Teknolojilere ve Elektronik Mühendisliği Eğitimine Etkileri”, *Bursa 3. Elektromekanik Sempozyumu*, Sayfa: 336-343, 1-5 Aralık 1993, Bursa.
41. F. Kurugöllü, A. E. Harmancı, H. Gümüşkaya, “TMS320C25 Yongaları ile Gerçekleştirilmiş Çift İşlemcili Paralel Sayısal İşaret İşleme Sistemi”, 1. *Sinyal İşleme ve Uygulamaları Kurultayı (SİU’93)*, Sayfa: 198-202, 21-22 Nisan 1993, Boğaziçi Üniversitesi.
42. H. Gümüşkaya, J. F. Beetem, “Galaxy Hardware Description Language”, *International Symposium on Computer and Information Sciences VII (ISCIS’7)*, pp. 487-490, November 2-4, 1992, Kemer, Antalya.
43. N. Beşli, H. Gümüşkaya, A. Sürmen, “Automation of a Gasoline Engine Test Bed”, *IFAC Workshop on Automatic Control for Quality and Productivity Symposium*, Vol. 1, pp. 88-95, June 3-5, 1992, İstanbul.
44. H. Gümüşkaya, “Gallium Arsenide’nin Bilgisayar Mimarisine Etkileri”, *Bursa 3. Bilgisayar ve Haberleşme Sempozyumu*, Sayfa: 39-49, 24-28 Nisan, 1991, Bursa.

### 11.5. Technical Reports and Other Publications

1. H. Gümüşkaya, *First Topics, Technologies, and Scientific Background for Development of a Railway Signalling System*, Technical Report, 92 pages, İstanbul Ulaşım A.Ş., May 2009.
2. H. Gümüşkaya, *Demiryolu Sinyal Sistemi Geliştirme Süreci ve Yol Haritası için Öneriler*, Teknik Rapor, 31 sayfa, İstanbul Ulaşım A.Ş., Mayıs 2009.
3. H. Gümüşkaya, *IP Kripto Cihazları Yönetim Sistemi–Yönetim Dokümanı, Sürüm 3, Sürüm 2 ve Sürüm 1*, TÜBİTAK-UEKAE, Mart 2002, Eylül 2001 ve Mayıs 2001.
4. H. Gümüşkaya, *IP Kripto Cihazları Yönetim Sistemi (Son Taslak, Hazırlık Taslağı ve İlk Taslak)*, TÜBİTAK-UEKAE, Aralık, Eylül ve Temmuz 2000.
5. H. Gümüşkaya, *IP Kripto Cihazları Yönetim Sistemi-Teknik Altyapı*, TÜBİTAK-UEKAE, Ocak 2000.
6. H. Gümüşkaya, *NATO Security Management AHWG Mission Statement*, TÜBİTAK-UEKAE, Sep. 2001.
7. H. Gümüşkaya, “Requirements of a Management System for Security Devices”, TÜBİTAK-UEKAE, September 2001.
8. H. Gümüşkaya, *Ağ Yönetimi: Gelecek MEBS (Ulusal Elektronik Bilgi Sistemleri) Güvenlik Sistemleri*, TÜBİTAK-UEKAE, 38 sayfa, Kasım 1999.
9. H. Gümüşkaya, “Sayısal İşaret İşlemcilerin Bilgisayarlara Olan Etkileri”, *Byte*, Mayıs, 1994.

### 12. Supervised Master Theses

<i>Kablosuz IEEE 802.11 Ağ Bağlantısı Üzerinden Elektronik Kontrol için Bir Ağ Protokolünün Geliştirilmesi</i>	Bora Tamer Yılmaz, Haliç University, Computer Engineering Department, September 2011
<i>Yaygın Hesaplama Kullanılarak Hastalıkların Teşhisi</i>	Canan Bayraktar, Haliç University, Computer Engineering Department, July 2011
<i>Hastalık Teşhisi için Kurumsal Uygulama Arayüzleri ve Performans Analizleri</i>	Doruk Tolga Atasoy, Haliç University, Computer Engineering Department, June 2011

<i>CMMI'in Bir Türk Bankacılık Sektöründe Uygulanması ve Analizi</i>	Orhan Tarkulu, Haliç University, Computer Engineering Department-Management Information Systems Program, June 2011
<i>CMMI Rehberliğinde PRINCE2 ile Servis Odaklı Mimari Tabanlı Uygulama Geliştirme</i>	Umut Şimşek, Haliç University, Computer Engineering Department, February 2011
<i>Mimarlarla Yönelik Bir Sosyal Ağ Sitesinin Tasarımı ve Geliştirilmesi</i>	Özerk Önder, Haliç University, Computer Engineering Department, July 2010
<i>Bir Kurumsal Ağın ve Güvenlik Yapılarının Modellenmesi ve Analizi</i>	Deniz Akbaş, Haliç University, Computer Engineering Department, Management Information Systems Program, July 2010
<i>A Service Oriented Reflective Middleware for Pervasive Computing</i>	Ahmet Volkan Gürel, Fatih University, Computer Engineering Department, July 2008
<i>Service Oriented Reflective Wireless Middleware</i>	Bora Yurday, Fatih University, Computer Engineering Department, September 2006
<i>Open Secure Mobile Agent System</i>	Osman Davulcu, Marmara University, Computer Engineering Department, January 2002

### 13. New Courses and Course Materials Developed

All courses that I taught and developed can be accessed from the following address:

<http://www.gumuskaya.com/Teaching/teaching.htm>

My course web sites, since 1997 to present, generally contain syllabus, lecture slides, an announcement page, all homework assignments along with their solutions, supplementary reading materials, information about projects (e.g., project guidelines, suggested project topics, presentation scheduling), sample exams with their solutions, and students grades.

#### **CENG/BILM 362 Computer Networks / Bilgisayar Ağları**

I have been giving and improving this course in spring semesters since 2004. I founded a Computer Networks Lab for this course and developed a new course schedule and lab experiments for this heavy loaded and 4-credit course in the Computer Engineering Department at Fatih University.

#### **CENG/BILM 465 Mobile and Wireless Networking / Gezgin ve Kablosuz Ağlar**

This is a new course in the Computer Engineering Department that I developed and taught first time in Fall 2004, and gave this course each Fall semester since that date. This course introduces mobile and wireless networking concepts, problems and solutions from more computer science point of view. I also founded a Wireless Networks Lab for this course.

#### **CENG/BILM 401 Software Engineering / Yazılım Mühendisliği**

I have been giving and improving this course since 2003 in the Computer Engineering Department at Fatih University. In this course students learn modern object oriented analysis, design, and implementation techniques using UML, Design Patterns, Java and Software Development Processes to develop a complex software project with a small team.

#### **CENG 535/BILM 410 Design Patterns**

This is a new course in the Computer Engineering Department that I developed and taught first time in Fall 2003. This is the first course in a university about design patterns and software architecture in Turkey.

*Network Programming with Java*, *Lecture Notes for Open Systems Networking courses* taught in 1997, 1998 and 1999 Fall Semesters in the Computer Engineering Department at Marmara University, 493 pages.

*Lojik Devre Temelleri*, 150 pages, Uludağ Üniversitesi, 1990.

## 14. Courses Taught in Universities

**Gediz University, Computer Engineering Department**  
September/2010 – Present, Professor (Education in English)

Year	Semester	Course Name	Students
2011-2012	Fall	EEE 251 Logic Design and Circuits	20
		COM 353 Microprocessors	2
	Spring		

Year	Semester	Course Name	Students
2010-2011	Fall	COM 101 Introduction to Programming	22
	Spring	COM 102 Object Oriented Programming	22
		MBIL 102 Bilgisayar Programlama	58
	SMY 531 Yazılım Mühendisliği	5	

**Haliç University, Computer Engineering Department**  
September/2008 – September/2010, Professor (Education in Turkish)

Year	Semester	Course Name	Students
2009-2010	Fall	BİM 411 Bilgisayar Ağları I	55
		BİM 511 İleri Yazılım Mühendisliği	10
		BİM/YBS 590 Seminer	12
	Spring	BİM 411 Bilgisayar Ağları I	34
		BİM 511 Bilgisayar Ağ Teknolojileri ve Uygulamaları	12
	BİM/YBS 590 Seminer	5	

Year	Semester	Course Name	Students
2008-2009	Fall	BİM 411 Bilgisayar Ağları	55
		BİM 441 Ağ Programlama	15
		BİM/YBS 521 Bilgisayar Ağ Yapıları	10
	Spring	BİM 494 İleri Yazılım Tasarımı	15
		BİM 438 Mobil Hesaplama	15

**Fatih University, Computer Engineering Department**  
August/2002 – August/2008, Associate Professor (Education in English)

Year	Semester	Course Name	Students
2007-2008	Fall	CENG 401 Software Engineering	30
		BİLM 401 Yazılım Mühendisliği	29
		CENG 465 Mobile and Wireless Networking	12
		BİLM 465 Gezin ve Kablosuz Ağlar	10
		CENG 577 Advanced Software Engineering	1
	Spring	CENG 362 Computer Networks (with Lab) (4 Credits)	62
		BİLM 362 Bilgisayar Ağları (Lab'lı) (4 Kredi)	42
		BİLM 112 BİLM 112 Bilgisayar Programlamaya Giriş	63
CENG 102 Algorithms and Programming (Summer 2008)		10	

Year	Semester	Course Name	Students
2006-2007	Fall	CENG 401 Software Engineering	24
		CENG 465 Mobile and Wireless Networking	6
		CENG 567 Mobile Computing	1
		CENG 577 Advanced Services in Communications	4
	Spring	CENG 362 Computer Networks (with Lab) (4 Credits)	41
		BILM 362 Bilgisayar Ağları (Lab'lı) (4 Kredi)	29
		CENG 531 Advanced Software Engineering	1

Year	Semester	Course Name	Students
2005-2006	Fall	CENG 217 Object Oriented Design	51
		BILM 217 Nesneye Yönelik Tasarım	35
		CENG 535 Mobile Computing	3
	Spring	CENG 401 Software Engineering	15
		CENG 362 Computer Networks (with Lab) (4 Credits)	27
		CENG 217 Object Oriented Design (Summer 2006)	16

Year	Semester	Course Name	Students
2004-2005	Fall	CENG 463/564 Network Programming	10
		CENG 535/465 Mobile and Wireless Networking	7
		CENG 535 Mobile Computing	8
	Spring	CENG 530 Software Design Methodology	2
		CENG 302 Software Engineering	19
		CENG 362 Computer Networks	26

Year	Semester	Course Name	Students
2003-2004	Fall	CENG 463/564 Network Programming	19 (18/1)
		CENG 535/410 Design Patterns	10 (0/10)
		CENG 321 Computer Architecture	33
	Spring	CENG 362 Computer Networks	35
		CENG 252 Computer Organization	22

Year	Semester	Course Name	Students
2002-2003	Fall	CENG 463/564 Network Programming	16 (8/8)
		CENG 217 Object Oriented Programming	41
		CENG 101 Computer Programming I	41
	Spring	CENG 530 Software Design Methodology	5
		CENG 302 Software Engineering	54
		CENG 102 Computer Programming II	51

### Marmara University, Computer Engineering Department

September/1997 – January/2002, Instructor, (Education in English)

Open Systems Networking	1997, 1998 and 1999 Fall Semesters
Distributed Systems	1998 Spring
Microprocessors	1997 Fall

### Uludağ University, Electronics Engineering Department

March/1990 – May/1997, Instructor (Education in Turkish)

Logic Circuits Fundamentals	Basic logic design
Logic Circuits	Introduction to microprocessors with Intel 8085 and 8051
Microprocessors I	X86 family and IBM PC based data acquisition and control
Microprocessors II	Applications of microprocessors, microcontrollers and PC
Computer Programming I	Introduction to computer programming with C
Computer Programming II	Data structures and algorithms with C
Adv. Programming Tech.	C++ and Windows programming
DSP Applications	TMS320 family and Digital Signal Processing Applications