CURRICULUM VITAE

NAME	Zeki Bayram
PERSONAL DATA	Born 13 November 1965, Famagusta, Cyprus. Married with two children. Languages spoken: Turkish (Native), English (Excellent), French (Good), Japanese (Fair), Greek (Fair)
RESEARCH INTERESTS	Semantic Web Services, Automated Deduction, Internet Technologies, Constraint Programming, Declarative Programming Languages, Expert Systems, Intelligent Agents, Logic Programming

EDUCATION

Institution	Years	Degree	Major
University of Pennsylvania	1983-1987	B.Sc. Economics	Accounting
University of Alabama at Birmingham	1987-1988	M.Sc.	Computer and Information Sciences
University of Alabama at Birmingham	1988-1993	Ph.D.	Computer and Information Sciences

PROFESSIONAL POSITIONS HELD

Institution	Rank	Dates	Department
Boğaziçi University	Assist. Prof.	09/1993 – 11/1999	Computer Engineering
Boğaziçi University	Assoc. Prof.	11/1999 – 08/2000	Computer Engineering
Eastern Mediterranean University	Assoc. Prof.	09/2000 – 10/2021	Computer Engineering
Eastern Mediterranean University	Professor	11/2021 – present	Computer Engineering

PROFESSIONAL ACTIVITIES

- Founding chairman of *Internet Technologies Research Center* at Eastern Mediterranean University (http://itrc.emu.edu.tr) (12/2005 - 2/2007).

- Founder and director of *Cybersoft Bilişim Teknolojileri Ltd.*, currently a dormant software company at Gazimağusa Teknopark (2008-2011).

- Coordinator and main instructor of the EU funded project *Upgrading Internet Technology skills of Information and Communication Technologies (ICT) Professionals* (December 2009 - December 2011). As part of the project, conducted a series of educational training modules for around 200 students and computer professionals at the Gazimağusa Teknopark.

- Worked as part-time researcher/consultant at TUBITAK research center (MAM) (12/95 – 1/98).

- Taught educational seminars for Erdemir (Ereğli Demir Çelik) company (1999).

- Performed consulting work and gave educational seminars on Object-Oriented Analysis and Design to Eczacıbaşı Holding employees (1998).

- Worked as part time instructor at Işık University (Istanbul) by appointment from Boğaziçi University (1998-2000).

- Served on the program/organizing committees of numerous conferences.

- Served as a reviewer for the following journals:

    o Journal of Kind Saud University

    o Expert Systems: The Journal of Knowledge Engineering

    o Turkish Journal of Electrical Engineering and Computer Sciences

    o Turkish Online Journal of Educational Technology

    o Scientific Programming

    o International Journal of Communications Systems

- Gave a tutorial on Object-Oriented Programming at the 1995 Computing (Bilişim) activities in Istanbul.

- Gave a tutorial on Internet Programming at the 2000 Computing (Bilişim) activities in Istanbul.

- As the chairman of the computer engineering departmental ABET committee, planned and coordinated all the activities of the ABET application process, leading to full accreditation of both the Computer Engineering and Software Engineering programs in 2016. Similarly, the Computer Engineering program was accredited for the first time in 2010 under my direction.

ACADEMIC ACTIVITIES

Curriculum Development and Teaching Innovations

- Defined and taught a new graduate course called *Automated Deduction.*

- Defined and taught new graduate course called *Constraint Programming.*

- Defined and taught new undergraduate elective course called *Internet Programming.*

- Defined new undergraduate elective course called *Modern Programming Platforms.*

- Designed rubrics for the evaluation of graduation project reports and presentations.

Textbooks and Other Teaching Aids

- Developed an online *Tutorial for the ADA '95 Programming Language.*

Courses Taught

- **Undergraduate:** Compiler Construction, Principles of Programming Languages, Discrete Mathematics, Formal Languages and Automata Theory, Database Management Systems, Algorithms and Data Structures, Programming Fundamentals, Internet Programming, Functional and Logic Programming, Object-Oriented Programming.

- **Graduate:** Automated Deduction, Logic Programming, Advanced Compiler Construction, Constraint Programming.

RESEARCH

My Ph.D. dissertation topic was the integration of Functional, Logic and Object-Oriented programming paradigms, with application to Deductive Databases. In the early years of my career at Boğaziçi University,

- I was involved in a research project, funded by NATO, where I helped develop benchmarks for real-time AI tools,
- I devised a new object-oriented analysis and design methodology that was geared towards businesses (BOOAD),
- I devised a way of passing parameters to constructors in the ADA language,
- I did research and development on a forward-chained expert system shell (SSST).

Upon joining Eastern Mediterranean University, my research areas mostly evolved towards the WWW and the semantic web, but continued to be based on high-level declarative paradigms. Working with graduate students, among others, we

- applied constraint logic programming to the "teacher relocation problem",
- used XSLT for specifying the semantics of programming languages and delivering executable content on the Internet,
- designed a functional language with XML syntax,
- showed that XSLT is Turing Complete,
- found a mistake in the unification algorithm of Frame-Logic and suggested a solution,
- proposed a security standard for ontologies,
- used sematic web services for university course registration,

- used Frame-Logic to specify and discover semantic web services,
- used filtering mechanisms to improve the efficiency of semantic web service discovery,
- improved choreography of semantic web services using abstract state machines,
- used Java-based agents in battlefield simulation and online education,
- designed and implemented intelligent tutoring systems for teaching algebra, and
- proposed a secure mobile payment scheme.

I also found and corrected numerous mistakes in the textbook "Introduction to Automata Theory, Languages, and Computation" by Hopcroft, Motwani and Ullman, including a significant one in the proof of NP-completeness of the satisfiability problem (http://infolab.stanford.edu/~ullman/ialc/errata3.html).

My ongoing research, together with Ph.D. student Umut Tekgüç, involves using Frame-Logic for knowledge-based question answering systems in a university setting.

GRADUATE STUDENT SUPERVISION

- Ph.D. graduates:

  i. Dr. Ruhsan Önder (Faculty member, Computer Engineering Department Chairwoman at Cyprus Science University, North Cyprus)

  ii. Assist. Prof. Dr. Omid Sharifi (Faculty member at Toros University, Turkey)

  iii. Assist. Prof. Dr. Samira Ghayekhloo (Faculty member at Arizona State University, U.S.A)

  iv. Assist. Prof. Dr. Shahin Mehdipour Ataee (Faculty member at Final International University, North Cyprus)

  v. Assist. Prof. Dr. Mahmoud Obaid (Faculty member at Arab American University, Palestinian Authority)

- Ph.D. candidates: Umut Tekgüç

- Master's degree graduates:

  i. Assist. Prof. Dr. Dilek Düştegör (Faculty member at Imam Abdulrahman Bin Faisal University, Saudi Arabia)

  ii. Assist. Prof. Dr Nagehan İlhan (Faculty member at Harran University, Turkey)

  iii. Dr. Şenay Kafkas

  iv. Şengül Çobanoğlu

  v. Jane Anaekwe

  vi. Bijan Zamanian

  vii. Muhammad Reza Fatemi Abhari

  viii. Dr. İmren Toprak

  ix. Saeid Asgharzadehbonab

  x. Vivian Aribisogan

PUBLICATIONS

Journal Papers

- **Frame Logic-based specification and discovery of semantic web services with application to medical appointments.** Expert Systems, ISSN:1468-0394, vol. 37, issue 1, 2020, doi: 10.1111/exsy.12387 (With Omid Sharifi and Shahin Mehdipour Ataee). (SCIE)

- **Instant Secure Mobile Payment Scheme.** IEEE Access, ISSN: 2169-3536, vol. 7, pp. 55669-55678, 2019, doi:10.1109/ACCESS.2019.2913430.   (With Mahmoud Obaid and Murad Saleh). (SCIE)

- **An Improved Abstract State Machine Based Choreography Specification and Execution Algorithm for Semantic Web Services.** Scientific Programming (Hindawi Publishing), ISSN: 1875-919X, February 2018, doi:10.1155/2018/4094951. (With Shahin Mehdipour Ataee). (SCIE)

- **Introducing Speedy Pay: A new Mobile Payment Scheme.** International Journal of Innovation, Management and Technology, ISSN:2010-0248, vol. 8, no. 3, pp. 188-192, 2017. doi: 10.18178/ijimt.2017.8.3.726 (With Mahmoud Obaid and Murad Saleh).

- **Unifying F-Logic Molecules: A Rectification to the Original Unification Algorithm.** Journal of Logic and Computation, ISSN:0955-792X, vol. 26, no. 3, pp. 1043-1049, June 2016, doi: 10.1093/logcom/exu051. (With Omid Sharifi) (SCIE)

- **Pre-Filtering Strategy to Improve Performance of Semantic Web Service Discovery.** Scientific Programming (Hindawi Publishing), ISSN: 1875-919X, September 2015, doi: 10.1155/2015/576463. (With Samira Ghayekhloo) (SCIE)

- **A Novel Rubric and Feature-Based Appraisal and Comparison Framework for the Evaluation of Semantic Web Services Composition Approaches**. Indian Journal of Science and Technology, ISSN:0974-5645, vol. 8, issue 33, pp. 1-15, October 2015, doi: 10.17485/ijst/2015/v8i33/72733 (With Samira Ghayekhloo) (WOS Zoological Record)

- **XSL Transformations: A delivery medium for executable content over the Internet**. Dr. Dobbs Journal, ISSN:1044-789X, vol 32, no. 5, pp. 48 – 53, May 2007. (With Ruhsan Onder) (SCIE)

- **Business Object-Oriented Analysis and Design Methodology.** Journal of Object-Oriented Programming, ISSN:0896-8438, vol. 12, no. 1, pp. 59-67, March/April 1999. (SCIE)

- **Implementing Constructor Calls with parameters in ADA'95.** Journal of Object-Oriented Programming, ISSN:0896-8438, vol. 11, no. 2, pp. 43-46, May 1998. (SCIE)

International Conference Papers

- **Improving Service Quality in Higher Education Through Natural Language Interfaces**. Proceedings of the International Conference on Quality in Higher Education (ICQH 2019), pp. 75-79, 26-27 December, 2019, Nicosia, North Cyprus. (With Umut Tekgüç).

- **A critical evaluation of Web Service Modeling Ontology and Web Service Modeling Language.** Proceedings of the 31. International Symposium on Computer and Information Sciences, pp. 97-105, 27-28 October, 2016, Krakow, Poland. (With Omid Sharifi)

- **A Novel Concise Specification and Efficient F-Logic Based Matching of Semantic Web Services in Flora-2.** Proceedings of the 30th International Symposium on Computer and Information Sciences (ISCIS 2015), pp. 191-198, 21-25 September, 2015, Imperial College, London, U.K. (With Shahin Mehdipour Ataee)

- **Semantic Web Services for University Course Registration.** Third Joint International Conference (JIST 2013), Seoul, South Korea, November 28-30 2013, Lecture Notes in Computer Science, Vol. 8388, pp. 3-16, 28-30 November, 2013, Seoul, South Korea. (With Sengul Cobanoglu)

- **Specifying Banking Transactions using Web Services Modeling Language (WSML).** Proceedings of the fourth International Conference on Information and Communication Systems (ICICS2013), pp. 138-143, 23-25 April, 2013, Irbid, Jordan. (With Omid Sharifi)

- **XLambda: A Functional Programming Language with XML Syntax.** Proceedings of the 24th International Symposium on Computer and Information Sciences (ISCIS 2009), pp. 663-668, 14-16 September, 2009, METU North Cyprus Campus, T.R.N.C. (With Ruhsan Onder)

- **Agent Coordination Using Enterprise Java Beans and XML Web Services in a Battlefield Environment.** Proceedings of the EECS'08 5th International Symposium on Electrical and Computer Systems, pp. 241-246, November 27-28, 2008, Gemikonağı, T.R.N.C. (With Bijan Zamanian)

- **A Proposal for Ontology Security Standards.** Proceedings of the 2008 International Conference on Semantic Web and Web Services, pp. 183-186, 14-17 July, 2008, Monte Carlo Resort, Las Vegas, Nevada, USA. (With Muhammad Reza Fatemi and Atilla Elci)

- **A Constraint Logic Programming Solution to the Teacher Relocation Problem**. Proceedings of the 2nd International Computer Engineering Conference Engineering the Information Society (ICENCO 2006), December 26-28, 2006, Cairo, Egypt. (With Nagehan İlhan)

- **Two Different Approaches of Modeling the Teacher Relocation Problem in a Constraint Logic Programming System and their Comparison.** Proceedings of the International Conference on Systems, Computing Sciences and Software Engineering (SCS2 06), organized as part of the International Joint Conferences on Computer, Information, and Systems Sciences, and Engineering (CIS2E 06), published in book "Innovations in E-learning, Instruction Technology, Assessment, and Engineering Education" by Springer, pp. 455-460, 4-14 December, 2006, Online. (With Nagehan İlhan)

- **XSLT Version 2.0 is Turing-Complete: A Purely Transformation Based Proof.** Proceedings of the 11th International Conference on Implementation and Applications of Automata (CIAA 2006), published as Lecture Notes in Computer Science LNCS 4094, pp 275-276, August 21-23, 2006 , Taipei, Taiwan. (With Ruhsan Önder)

- **Implementation Strategies for "Equation Guru," A User Friendly Intelligent Algebra Tutor.** Proceedings of ICEIS 2006, International Conference on Enterprise Information Systems, pp. 58-65, 23-27 May, 2006, Paphos, Cyprus. (With Şenay Kafkas and Hüseyin Yaratan)

- **A User-Friendly Intelligent Algebra Tutor.** Proceedings of the V. International Educational Technologies Conference, pages 23-29, 21 - 23 September, 2005, Sakarya, Turkey. (With Şenay Kafkas, Hüseyin Yaratan)

- **An Investigation of the Course-Section assignment problem**. Proceedings of the 20th International Symposium on Computer and Information Sciences (ISCIS 2005), published as Lecture Notes in Computer Science LNCS 3733, pp. 874-883, 26-28 October, 2005, Istanbul, Turkey.

- **Interpreting Imperative Programming Languages In Extensible Stylesheet Language Transformations (XSLT).** Proceedings of the IASTED International Conference on Internet and Multimedia Systems and Applications (EuroIMSA 2005), pp. 131-136, 21-23 February, 2005, Grindelwald, Switzerland. (With Ruhsan Onder)

- **A Scalable Application Architecture for Composing News Portals on the Internet.** Proceedings of the 1st International Computer Engineering Conference, New Technologies for the Information Society (ICENCO'2004), pp. 779-783, 27-30 December, 2004, Cairo, EGYPT. (With Serpil Tok)

- **Distance Education Using XML Technology.** Proceedings of the 5th International Conference on Information Technology Based Higher Education and Training (ITHET '04), pp. 43-47, 31 May - 2 June, 2004, Istanbul, Turkey. (With Şenay Kafkas)

- **Forward-Chained Rules for Specifying Algorithms.** Proceedings of the Fourteenth International Symposium on Computer and Information Sciences, pp. 1003-1005, 18-20 October, 1999, Kuşadası, Turkey. (single author)

- **SSST (State-Space Search Tool): A Probabilistic Forward-Chained Expert System Shell with Full Backtracking.** Proceedings of the Eleventh International Symposium on Computer and Information Sciences, pp. 395-404, 6-8 November, 1996, Antalya, Turkey. (single author)

- **A Deductive Declarative Object-Oriented Data Model and Query Language based on Narrowing.** Proceedings of the Eleventh International Symposium on Computer and Information Sciences, pp. 235-244, 6-8 November, 1996, Antalya, Turkey. (With Barrett R. Bryant and Faik Hakan Bilgen)

- **ROSE: A Practical Higher-Order Functional/Logic Language.** Proceedings of the Eleventh International Symposium on Computer and Information Sciences, pp. 713-721, 6-8 November, 1996, Antalya, Turkey. (With Barrett R. Bryant and Ünal Altınay)

- **Functional-Logic programming for Smalltalkers: the FLOOP System.** Proceedings of the Tenth International Symposium on Computer and Information Sciences, pp. 651-658, 17 October, 1995, Aydın, Turkey. (With Barrett R. Bryant and Hakan Akçalar)

- **Conditional Term Rewriting as a Deductive Database Language.** Proceedings of the 1992 Joint International Conference and Symposium on Logic Programming (JICSLP'92) , Deductive Databases Workshop, pp. 126-135, 14 November, 1992, Washington, D.C., U.S.A. (With Barrett R. Bryant)

Technical Reports

- **An Integrated E-Unification/Narrowing Algorithm.** *Technical Report* at the Department of Computer and Information Sciences, UAB. (1990) *(Single author)*

Other publications

- **Integrating Functional, Logic and Object-Oriented Programming Language Paradigms with Application to Deductive Databases**. *Ph.D. Thesis, University of Alabama at Birmingham, Computer and Information Sciences Department.* https://dl.acm.org/doi/book/10.5555/194020 (1993)

- **Integrating Functional, Logic and Object-Oriented Programming Paradigms (Abstract).** *The Journal of the Alabama Academy of Science,* Vol. 64, No. 2, page 161 (April 1993) *(Single author)*

FUNDED RESEARCH PROJECTS

- *Development of a Semantic Web Services Architecture for e-Government applications.* TRNC Ministry of Education research grant. Funded 10,000 YTL – (approx. 6,800 USD). Duration: June 2006-June 2007.

- *Integration of SSST and ROSE.* Funded (250,000,000TL- approx. 3,000 USD) by the research fund of Boğaziçi University. Duration: June 1996 - June 1998.

- *Development of an expert system shell with constraint solving capability.* Funded (100,000,000TL approx. 2,500 USD) by the research fund of Boğaziçi University. Duration: January-December 1994.

- *Development of benchmark programs for evaluating real-time AI tools.* Performed as part of a research team at Boğaziçi University within the Euclid RTP11.3 "Mission and Battlefield Simulation" project. Team members: Prof. Selahattin Kuru and Prof. Levent Akın. Duration: January 1994 - July 1994.

- *Integration of Functional and Logic Programming Languages.* Student research grant from the Alabama Academy of Science (4/91).

SCHOLARLY AWARDS AND SCHOLARSHIPS

- Awarded 9-day trip to Paris by L'Alliance Française after being successful in a written French examination (1981).

- Awarded CASP scholarship by the U.S.A. for undergraduate studies at the University of Pennsylvania (1983-1987).

- Awarded Japanese *Monbusho* Scholarship to attend and conduct research at Ibaraki University in Japan (April 1989 – Sept. 1990).

PARTICIPATION IN PROFESSIONAL ORGANIZATIONS

- Professional Member of the Association for Computing Machinery (ACM).

SERVICES FOR THE UNIVERSITY

- Served as the ABET committee chairman at the Computer Engineering Department (January 2010 -continuing). Organized and led the preparations for successful ABET accreditations in 2010 and 2016. Continuing the role for the upcoming 2022 application.

- Served as the Engineering Faculty ABET committee member (January 2010 - continuing).

- Served as a departmental promotion committee member (2008 - 2012).

- Served as a member of the faculty search committee (2002 - 2003).

- Served as a member of the Summer Training committee. Re-organized and streamlined the summer training procedures. (2004 - 2005).

- Served as a member of a committee for writing a thesis guideline for graduate students of the faculty of Engineering (2003).

- Appeared twice on national TV stations, promoting the university and explaining the ABET procedures.

- Formed a team and tested a proposed new web site for the university, proving feedback and suggestions for improvement (2007).

- Served as the chairman of Internet Technologies Research Center (2005-2007).

- Served as an elected member of the Engineering Faculty Council.

SERVICES FOR THE COMMUNITY

- Served as a member of the Eastern Mediterranean Primary Parent-Teacher Association (2002 - 2004).

- Served as a member of the Eastern Mediterranean College Parent-Teacher Association (2005 - 2009).

- Through the Cybersoft Bilişim Teknolojileri Ltd. company at the Gazimağusa Teknopark, organized and taught courses on Internet programming (client and server side), cloud computing and the semantic web. Courses were offered for free to the public, as part of an EU funded project (2009-2011).