Tolga Ayav

Nationality: Turkish **Date of birth:** 05/05/1974

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Scopus: https://www.scopus.com/authid/detail.uri?authorId=13408184500

IZTECH Profile: https://gcris.iyte.edu.tr/cris/rp/rp00027

Website: https://tolgaayav.gitlab.io/home/

ABOUT ME

I am a Professor in the Department of Computer Engineering at İzmir Institute of Technology (IZTECH). I hold a Bachelor of Science in Electronics Engineering, as well as Master's and Ph.D. degrees in Computer Engineering. My research primarily focuses on Machine Learning Applications, Language Models, Software Testing and Verification, and Real-Time and Fault-Tolerant Embedded Systems. I have authored 34 publications indexed by Scopus, which have collected 238 citations, with an h-index of 9.

WORK EXPERIENCE

Professor

Izmir Institute of Technology [11/2023 – Current]

City: Izmir | **Country:** Türkiye | **Website:** www.iyte.edu.tr | **Email address:** tolgaayav@iyte.edu.tr | **Name of unit or department:** Department of Computer Engineering - **Business or sector:** Professional, scientific and technical activities

I have been affiliated with İzmir Institute of Technology (IZTECH) since 1999, a leading public research university located in Urla/Izmir, renowned for its focus on science, engineering, and technology. My primary responsibilities include delivering lectures to both undergraduate and graduate students, supervising theses, and overseeing various research projects. Additionally, I have held several significant administrative roles. I am currently serving as the Vice Dean of the Faulty of Engineering.

Company partner and CTO

Research Ecocsystems Co. Inc. [01/2021 – Current]

City: Izmir | **Country:** Türkiye | **Website:** https://www.researchecosystems.com

Research Ecosystems is a startup based in the university's Technopark. The company's flagship product, GCRIS, is a research and performance evaluation software designed for universities and research foundations. The software incorporates several AI-powered features and is offered on a subscription basis. Currently, it is utilized by over ten universities.

Associate Professor

Izmir Institute of Technology [04/2018 – 11/2023]

City: Izmir | **Country:** Türkiye

My primary responsibilities included delivering lectures to both undergraduate and graduate students, supervising theses, and leading various research projects. From 2018 to 2021, I also served as Chair of the Department of Computer Engineering.

Assistant Professor

Izmir Institute of Technology [04/2006 – 04/2018]

City: Izmir | **Country:** Türkiye

My primary responsibilities included delivering lectures to both undergraduate and graduate students, supervising theses, and overseeing various research projects. In addition to these duties, I held several administrative roles. I

served as Vice Dean of the Graduate Institute from 2010 to 2014 and as Vice Chair of the Department of Computer Engineering from 2009 to 2018.

Company partner

Inovel Electronics and Software Systems Ltd. Co. [2009 – 2017]

City: İzmir | **Country:** Türkiye

We carried out a range of projects related to embedded systems, including the provision of consultancy services.

Postdoctoral Fellow

INRIA Rhône-Alpes [08/2004 – 12/2005]

City: Grenoble | **Country:** France

Through a grant from the Ministry of Education and Research in France, I contributed to the POPART project by developing fault-tolerance and automatic program transformation techniques to improve fault tolerance in real-time systems.

Instructor

Izmir Institute of Technology [01/2000 – 04/2005]

City: Izmir | **Country:** Türkiye

I simultaneously taught several undergraduate courses while pursuing my PhD.

Automation Engineer

EN-KO Control Systems Ltd. Co. [09/1995 – 10/1998]

City: Izmir | **Country:** Türkiye

I worked in the Industrial Automation Department, where I led and contributed to several key projects. Notable projects include:

• The development of a remote-controlled mine clearance tank,
• The design of an electrical safety testing device for household appliances,
• The implementation of a monitoring system for the refrigerator testing room in Profilo's R&D division (now Bosch-Profilo-Siemens).

EDUCATION AND TRAINING

PhD in Computer Engineering

Ege University [09/1999 – 08/2004]

City: Izmir | **Country:** Türkiye | **Website:** https://bilmuh.ege.edu.tr/eng-/Homepage.html | **Field(s) of study:** Computer Science | **NQF Level:** Adaptive Scheduling in Real-Time Systems | **Thesis:** Adaptive Real-Time Feedback Scheduling

Abstract: Future embedded control systems will need to operate in more open and unpredictable environments. Traditional scheduling algorithms, such as rate-monotonic and earliest-deadline-first, are well-suited for closed and highly predictable environments, but they lack the adaptability needed for dynamic conditions. This highlights the need for more adaptive techniques, such as feedback control scheduling, to handle transient overloads, utilize spare capacity available with traditional algorithms, and enhance the fault tolerance of real-time systems. In this thesis, a feedback control rate-monotonic scheduling framework is proposed, along with its implementation and evaluation in Real-Time Linux. First, PID control is chosen as the control function, and its stability is analyzed using classical control theory, alongside other optimization techniques through statistical representation of the system, to demonstrate the efficacy of the proposed system. A novel optimal controller is also introduced as an alternative to PID, and their performances are compared. The proposed feedback scheduling system provides a suitable structure for future real-time embedded systems.

MSc in Computer Engineering

Izmir Institute of Technology [09/1995 – 08/1999]

City: Izmir | **Country:** Türkiye | **Website:** https://www.iyte.edu.tr | **Field(s) of study:** Computer Engineering | **Thesis:** An operating system for data acquisition and control applications

Abstract: Traditional controllers used in industrial environments today often fail to meet the demands of many data acquisition and control applications. As a result, personal computers have gained popularity in industry, much as they have in other fields, due to their numerous advantages and relatively low cost. In this project, a PC-based embedded controller was designed for data acquisition and control tasks, and a real-time multitasking executive was developed to run on the DOS operating system. The real-time executive also includes a scripting language that enables efficient and rapid task development.

BSc in Electrical and Electronics Engineering

Dokuz Eylül University [09/1991 – 07/1995]

City: Izmir | **Country:** Türkiye | **Website:** www.deu.edu.tr | **Thesis:** Design of a Multidrop Bus Network for Industrial Communication

Abstract: In this project, a master/slave multidrop bus network was designed using RS-485 communication. Two types of electronic boards were developed: one for the master PC, which connects to its ISA bus, and another for the slave industrial controllers with multiple I/O ports. The master ensures real-time communication through a concrete timer interrupt mechanism.

LANGUAGE SKILLS

Mother tongue(s): Turkish

Other language(s):

English

LISTENING C1 **READING** C2 **WRITING** C2

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

French

LISTENING A2 **READING** A2 **WRITING** A2

SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

Spanish

LISTENING A1 **READING** A1 **WRITING** A1

SPOKEN PRODUCTION A1 **SPOKEN INTERACTION** A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PROJECTS

[01/09/2024 – 30/08/2026]

MAPIT - Mobilizing Advanced Partnerships for Digital Innovation and Transformation I serve as the coordinator of the MAPIT project (HORIZON-WIDERA-2023-ACCESS-04 Project: 101158945). The project's objective is to enhance participation in Horizon Europe and to strengthen partnerships between universities and industry. The Roadmapping Strand focuses on identifying and planning research and innovation (R&I) partnerships, while the Future Studies Strand is dedicated to upskilling R&I managers and administrators. As part of the Roadmapping Strand, we are developing a software tool based on a large language model (LLM), trained using data from CORDIS, OpenAire, and other relevant project databases.

Link: https://cordis.europa.eu/project/id/101158945

[08/2024 – Current]

Predictive Maintenance for Wind Turbines I am providing consultancy services to FU Energy for this project, which encompasses several key dimensions, including generating intelligent reports from real-time turbine logs, analyzing data to predict potential issues, estimating the remaining useful lifetime, and developing a digital twin application. FU Energy is a leading service provider, specializing in the maintenance, repair, installation, and commissioning of over 300 wind turbines.

[01/2024 – 01/2025]

PGS-Optimizer: A Federated Network and Learning-Enhanced Polygenic Risk Model Development Tool This project is a collaboration between Research Ecosystems and Solaris Genomics, funded by TÜBİTAK. The objective is to design and develop modular software for the analysis of high-volume genomic data, capable of operating on a federated network and supported by federated learning. The software will enable researchers to create new polygenic score (PGS) models using both genotype and phenotype data. Additionally, it will facilitate the creation of large-scale sample sets while ensuring the confidentiality of genetic data owners. A key goal of the project is to enhance and disseminate the accuracy of genetic risk estimates by addressing the current challenges in developing genetic risk prediction tools. I am leading the work packages for federated network design and federated learning.

[08/2023 – 08/2025]

Remaining Useful Lifetime (RUL) Prediction for CNC Tools to Increase the Productivity and Efficiency I am providing consultancy services to Siskon Software & Automation in this TÜBİTAK-funded project. The objective is to predict the remaining useful life (RUL) of CNC tools by collecting real-time sensory data from the machines and utilizing machine learning techniques for analysis.

[01/2024 – 08/2024]

Robotic Squid for Underwater Manipulation and Intervention The project addressed the research challenges related to the development of soft biomimetic underwater robots and novel actuation systems. The project was funded by TUBİTAK (The Scientific and Technological Research Council of Türkiye) and coordinated by two universities: Bahcesehir University and Izmir Institute of Technology. I was the coordinator of the project in IZTECH.

[08/2022 – 09/2023]

G-FED: Dynamic Consent-Enabled Privacy Preserving Federated Search and Analytics Platform for Genomic Research and Applications This project is a collaboration between Research Ecosystems and Solaris Genomics, funded by TÜBİTAK. As part of the project, the G-FED platform was developed—an infrastructure with a federated architecture designed to ensure confidentiality, respect, and responsibility in the sharing of clinical and genomic data across research and healthcare services. The platform also offers dynamic consent functionality for individuals as data providers. The project has been successfully completed and has garnered significant interest from investors. It is currently in the process of becoming a spin-off company.

PUBLICATIONS

[2023]

Estrus Detection and Dairy Cow Identification with Cascade Deep Learning for Augmented Reality-Ready Livestock Farming Sensors 2023, 23(24), 9795.

İbrahim Arıkan, Tolga Ayav, Ahmet Çağdaş Seçkin, Fatih Soygazi

[2023]

Spectral Test Generation for Boolean Expressions Int. Journal of Software Engineering and Knowledge Engineering, 33(08):1239-1260.

Tolga Ayav

[2023]

Mutation-Based Minimal Test Suite Generation for Boolean Expressions Int. Journal of Software Engineering and Knowledge Engineering, 33(06):865-884

Ayav T., Belli, F.

[2023]

Lightweight and Energy Efficient Secrecy Outage Probability-based Friendly Jamming 11th International Symposium on Digital Forensics and Security (ISDFS 2023). 11-12 May 2023, Chattanooga, A.B.D.

Yaman, O., Ayav, T., Erten, Y.M,

[2023]

A Lightweight Self-Organized Friendly Jamming International Journal of Information Security Science. (12)1:13-20.

Yaman O., Ayav T., Erten Y.M.

[2021]

Test input generation from cause–effect graphs Software Quality Journal (2021).

Ufuktepe, D. K., Ayav T., Belli, F.

[2021]

Achieving query performance in the cloud via a cost-effective data replication strategy Soft Computing Journal.

Tos, U., Mokadem, R., Hameurlain, A., Ayav T.

[2021]

A Novel Countermeasure for Selective Forwarding Attacks in IoT Networks 3rd International Informatics and Software Engineering Conference, IISEC 2022. 15-16 Dec. 2022, Ankara

Yaman, O., Sokat, B., Ayav, T., Erten, Y.M,

[2021]

Secure IoT Update Using Blockchain 2nd International Informatics and Software Engineering Conference (IISEC), 2021, pp. 1-6,

M. Kaptan, E. Tomur, T. Ayav and Y. M. Erten.

[2021]

A Metric for Measuring Test Input Generation Effectiveness of Test Generation Methods for Boolean Expressions 15th Turkish National Software Engineering Symposium (UYMS), 2021.

Ufuktepe D.K., Ufuktepe E., Ayav T.

[2020]

Human-Robot Interfaces of the NeuRoboScope: A Minimally Invasive Endoscopic Pituitary Tumor Surgery Robotic Assistance System J. Med. Devices.

Dede, M.I. Can, Kiper G., Ayav T. et. al.

[2020]

Ensuring performance and provider profit through data replication in cloud systems Cluster Computing

Tos U., Mokadem, R., Hameurlain A., Ayav T. and Bora S.

[2020]

Loyalty Program using Blockchain 2020 IEEE International Conference on Blockchain.

Sonmezturk O., Ayav T., Erten Yusuf M.

[2017]

Prioritizing MCDC test cases by spectral analysis of Boolean functions Journal of Software Testing, Verification and Reliability

Ayav T.

[2017]

Design notes of microprocessor u311.1 Technical report no: IYTE-COMPENG-2017-001, 15 October 2017.

Tolga Ayav

[2016]

Identifying critical architectural components with spectral analysis of fault trees Appl. Soft Comput. J. 49 (2016): 1270 - 1282,

Ayav T., Sözer H.

[2016]

Moving Switching Functions to Continuous Domain Workshop on Model-based Verification and Validation, in conjunction with 4th IEEE International Conference on Software Quality, Reliability and Security (QRS 2016). Vienna, August 1-3, 2016.

Ayav T., Sozer H.

[2016]

A Performance and Profit Oriented Data Replication Strategy for Cloud Systems (Best paper award) IEEE Int. Conf. on Cloud and Big Data Computing

Tos U., Mokadem R., Hameurlain A., Ayav T., Bora S.

[2015]

Dynamic replication strategies in data grid systems: a survey Journal of Supercomputing

Tos U., Mokadem, R., Hameurlain A., Ayav T. and Bora S.

[2015]

Full-Exact Approach for Frequent Itemset Hiding International Journal of Data Warehousing and Mining, 11(04), pp.49-63

Ayav T., Ergenc B.

[2015]

Boolean Differentiation for Formalizing Myers' Cause-Effect Graph Testing Technique Workshop on Model-based Verification and Validation, in conjunction with 4th IEEE International Conference on Software Quality, Reliability and Security (QRS 2015). Vancouver, August 3-5, 2015.

Ayav T., Belli F.

[2015]

Model Based Testing of VHDL Programs 7th IEEE International Workshop on Software Test Automation (in conjunction with COMPSAC 2015: The 39th Annual International Computers, Software & Applications Conference), Taichung, Taiwan - July 1-5, 2015.

Ayav T., Tuglular T., Belli F.

[2015]

Model Checker-Based Delay Fault Testing of Sequential Circuits 11th Workshop on Dependability and Fault Tolerance (VERFE'15) in conjunction with ARCS 2015, Porto, Portugal, March 24-27, 2015.

Takan S., Guler B., Ayav T.

[2015]

Transforming VHDL to timed automata Technical report no: IYTE-COMPENG-2015-001, 07 May 2015.

Ayav T., Tuglular T., Belli F.

[2014]

Coefficient-Based Exact Approach for Frequent Itemset Hiding eKNOW 2014 6th International Conference on Information, Process, and Knowledge Management, IARIA.

Leloglu E., Ayav T., Ergenc B.

[2013]

A review of cloud deployment models for e-learning systems 43rd Annual IEEE/IFIP International Conference on Dependable Systems and Networks, Budapest, June 2013.

Leloglu E., Ayav T., Aslan B.

[2011]

Adaptive RTP Rate Control Method Proceedings of COMPSAC 2011. Pg. 7-12. Munich, Germany , July 2011

Tos U., Ayav T.

[2010]

Towards Test Case Generation for Synthesizable VHDL Programs Using Model Checker Workshop on Model-based Verification and Validation, in conjunction with 4th IEEE International Conference on Secure Software Integration and Reliability Improvement (SSIRI 2010). Singapore, June 9-11, 2010.

Ayav T., Tuglular T., Belli F.

[2010]

Design of a Secure Microprocessor 4th International Security and Criptology Conference (ISC Turkey'10), Ankara, Turkey, May 6-8, 2010.

Toker A., Ayav T.

[2009]

Solving the Course Scheduling Problem Using Simulated Annealing Proceedings of the IEEE International Advance Computing Conference (IACC'09), pg. 462- 466 , Patiala, India, March 2009.

Aycan E., Ayav T.

[2008]

Implementing Fault-Tolerance by Automatic Program Transformations ACM Transactions on Embedded Systems, 7(04), pp. 1 - 43.

Ayav T., Fradet P., Girault A.,

[2006]

Optimal Control for Real-Time Feedback Rate-Monotonic Schedulers Lecture Notes in Computer Science, Vol. 3733, pp. 894 - 903.

Ayav T., Ferrari-Trecate G.

[2006]

Implementing Fault-Tolerance in Real-Time Systems by Automatic Program Transformations International Conference on Embedded Software, EMSOFT'06, Seoul, South Korea, October 2006, ACM.

Ayav T., Fradet P., Girault A.

[2006]

Implementing Fault-Tolerance in Real-Time Systems by Program Transformations INRIA Research Report Nr. 59 15

Ayav T., Fradet P., Girault A.

[2005]

Feedback Control Static Scheduling for Real-Time Distributed Embedded Systems Proceedings of the 11th IEEE International Conference on Embedded and RealTime Computing Systems and Applications (RTCSA), pages 173-176, Hong Kong, China, August 2005.

Ayav T., Sorel Y.

[2004]

Stability Properties of Adaptive Real-Time Feedback Scheduling: A Statistical Approach 12th Real-Time Embedded Systems Conference, pages 259-277, Paris, March 2004.

Ayav T, Ferrari-Trecate G. and Yilmaz S.

[2002]

Neuro-Fuzzy Controller in Real-Time Feedback Schedulers 10th Workshop on Nonlinear Dynamics of Electronic Systems, pages 3.37-3.40, Izmir, Turkey, June 2002.

Ayav T., Yilmaz S.

[2000]
A New Embedded Controller for Data Acquisition and Control Applications Proceedings of the 14th International Symposium on Computer and Information Sciences, pages 997-999, Kusadasi, 18-20 October 1999.

Ayav T., Aytac S.

BOOKS

[2022]
Concepts of Computer Architecture - Hands-on Design Principles with VHDL

Tolga Ayav. ISBN 978-625-427-263-9. 110 pages. Nobel Academic Publishing Co.

Build Your Own Microprocessor

Computer architecture defines a set of rules and methods for the organization of a computer system. A microprocessor, as a central processing unit, is the most essential part of it. The microprocessor contains both combinational and sequential logic circuitries that perform arithmetic, logic and control operations by interpreting and executing the program instructions. Building a microprocessor is one of the ultimate goals of digital design. In this book, you will find the preliminaries of a microprocessor and computer design. The book is intended for the undergraduate students of computer or electrical engineering and its focus will be on the design principles of a microprocessor. This book also gives an insight into the low level and high level computer programming, program compilation, multitasking and programming with VHDL hardware description language. By the end of this book, you'll be able to design and build your own microprocessor in a hardware description language, and to run it by simulations and writing assembly programs.

Things you will learn: Microprocessor design, VHDL programming, HDL simulation, and assembly programming.

Link: https://gitlab.com/tolgaayav/up311-microprocessor

PATENTS

[2022]
A System embedded in concrete that monitors, calculates, records, and transmits the traumatic history of buildings

Patent Issued by Turkish Patent Institute.
Inventors: Ozdemir, Aktas, Baba, Ayav, Yilmaz

The invention is a valuation system for concrete structures that detects their traumatic history, such as earthquakes, floods, fires, and similar events, using embedded sensors and converts this information into a comprehensible, measurable, and comparable numerical value within a specific systematics.

Link: https://portal.turkpatent.gov.tr/anonim/arastirma/patent/sonuc/dosya?patentAppNo=2020/12551&documentsTpye=all

[2021]
A Method for Prioritizing MC/DC Tests

Patent issued by Turkish Patent Institute.
Inventor: Ayav T.

The invention relates to the MC/DC (Modified Condition/Decision Coverage) test, a testing method recommended by the DO-178 standard and used during the development of level A critical software.

Link: https://portal.turkpatent.gov.tr/anonim/arastirma/patent/sonuc/dosya?patentAppNo=2016/20422&documentsTpye=all

THESES SUPERVISED

[01/2023 – Current]

Distributed Optimization based Synchronization of Autonomous Vehicles

PhD Thesis. Candidate: Mr. Berkay Saydam.
Grant: TUBITAK 2244 Industrial PhD Fellowship Program.

Company: TTTech Auto Izmir

This thesis aims to address the inefficiencies and safety issues caused by the lack of synchronization between vehicles and traffic lights, which can result in crashes, unnecessary fuel consumption, and delays in future autonomous systems. The proposed solution focuses on optimizing vehicle speed to better align with traffic light changes, avoiding sudden stops and wasted time. While a centralized approach could solve this problem, it introduces communication overhead and is not suitable for real-time systems. Therefore, the project will explore and compare centralized and distributed optimization methods, with an emphasis on scalability and real-time responsiveness. The outcome will be a method to dynamically determine the optimal approach based on environmental parameters, enhancing traffic flow and safety.

[2023 – Current]

Developing Software Framework for Graphene/SOI-based Photodiode Matrices

PhD Thesis. Candidate: Mr. Burak Korcuklu.
Co-advisor: Prof. Dr. Cem Çelebi (Quantum Device Lab. at the Dept. of Physics)

Integration of graphene/SOI-based photodiode matrices holds great promise for compact and efficient image processing systems. This research aims to develop a machine learning software framework specifically designed to create and process super-low-resolution images by capturing the signals generated by these matrices in a meaningful and processable way, paving the way for advanced imaging capabilities in various fields.

[2023 – Current]

Translating Natural Language into Qualitative SQL Search Queries with Multiagent LLMs

MSc Thesis. Mrs. Simge Sönmez.

This thesis explores the development of a system that translates natural language inputs into qualitative SQL search queries using multi-agent Large Language Models (LLMs). The system leverages the capabilities of multiple specialized agents, each responsible for handling specific aspects of the query, such as intent recognition, schema mapping, and query generation. By utilizing multi-agent LLMs, the system aims to improve accuracy and efficiency in converting complex, natural language questions into SQL queries, making database interactions more intuitive for users without SQL expertise. The study also addresses challenges in query optimization, ambiguity resolution, and real-time processing.

[06/2022 – Current]

Federated Learning on Blockchains

PhD Thesis. Candidate: Mr. Adil Çoban

This project focuses on integrating **Federated Learning (FL)** with **blockchain technology** to enhance data privacy, security, and decentralization in machine learning. Federated learning allows multiple parties to collaboratively train machine learning models without sharing raw data, while blockchain ensures a secure, immutable, and decentralized

framework for managing the learning process. By leveraging blockchain, the project aims to address key challenges such as trust, accountability, and transparency in federated learning systems.

[2023]

Testing microservice applications

MSc Thesis by Mr. Özgür Öztürk.
Co-advisor: Prof. Dr. Onur Demirörs

Link: https://gcris.iyte.edu.tr/handle/11147/14490

[2022]

Location privacy in cellular networks

PhD Thesis by Mr. Okan Yaman.
Co-advisor: Prof. Dr. Y. Murat Erten.

Link: https://gcris.iyte.edu.tr/handle/11147/13430

[2022]

A blockchain application for payment and traffic management in smart vehicles

MSc Thesis by Mr. Boğaçhan Yiğitbaşı

Link: https://gcris.iyte.edu.tr/handle/11147/12627

[2020]

Blackhole attacks in IoT networks

MSc Thesis by Mr. Barış Sokat
Co-advisor: Prof. Dr. Y. Murat Erten

Link: https://gcris.iyte.edu.tr/handle/11147/11092

[2020]

Predictive maintenance for smart industry

MSc Thesis by Mr. Asad Asadzade

Link: https://gcris.iyte.edu.tr/handle/11147/11050

[2020]

Evaluation of scheduling architectures for OSEK/VDX compliant hard real-time operating systems

MSc Thesis by Mr. Berkay Saydam.

Link: https://gcris.iyte.edu.tr/handle/11147/11017

[2020]

Internet of things simulation using cisco packet tracer

MSc. Thesis by Mr. David Therra
Co-advisor: Prof. Dr. Y. Murat Erten

Link: https://gcris.iyte.edu.tr/handle/11147/11000

[2020]

Blockchain application on loyalty card

MSc. Thesis by Mr. Osman Sönmeztürk
Co-advisor: Prof. Dr. Y. Murat Erten

Link: https://gcris.iyte.edu.tr/handle/11147/10945

[2019]

Block-chain based remote update for embedded devices

MSc. Thesis by Mrs. Melike Kaptan
Co-advisor: Prof. Dr. Y. Murat Erten

Link: https://gcris.iyte.edu.tr/handle/11147/10933

[2019]

Effectiveness of using clustering for test case prioritization

MSc Thesis by Mr. Can Günel

Link: https://gcris.iyte.edu.tr/handle/11147/7480

[2019]

A learning-based demand classification service with using XGBoost in institutional area

MSc Thesis by Mr. Çağrı Gürakın

Link: https://gcris.iyte.edu.tr/handle/11147/7478

[2019]

A dedicated server design for physical web applications

MSc Thesis by Mr. Anes Abdennebi

Link: https://gcris.iyte.edu.tr/handle/11147/7461

[2019]

Fourier analysis based testing of finite state machines

PhD Thesis by Mr. Savaş Takan

Link: https://gcris.iyte.edu.tr/handle/11147/7488

[2018]

Assessment and certification of safety critical software

MSc Thesis by Mrs. Bengisu Uzun Yenigün

Link: https://gcris.iyte.edu.tr/handle/11147/6983

[2017]

Data replication in large-scale data management systems

PhD Thesis by Mr. Uras Tos.

This was a joint PhD study between IZTECH and University of Paul Sabatier in Toulouse. The other advisor of the thesis was Prof. Dr. Abdelkader Hameurlain.

Link: https://theses.hal.science/tel-01820748v1/document

[2016]

Test case generation from cause effect graphs

MSc Thesis by Mrs. Deniz Kavzak Ufuktepe
Co-advisor: Prof. Dr. Fevzi Belli

Link: https://gcris.iyte.edu.tr/handle/11147/5704

[2014]

An exact approach with minimum side-effects for association rule hiding

MSc Thesis by Mr. Engin Leloğlu

Link: https://gcris.iyte.edu.tr/handle/11147/4202

[2014]

Parallelization of a novel frequent itemset hiding algorithm on a CPU-GPU platform

MSc Thesis by Mr. Samuel Bacha Heye

Link: https://gcris.iyte.edu.tr/handle/11147/4190

[2012]

Quality-adaptive media streaming

MSc Thesis by Mr. Uras Tos

Link: https://gcris.iyte.edu.tr/handle/11147/3506

[2010]

Designing programmable logic controller for data acquisition and control

MSc Thesis by Mr. Emre Gözütok

Link: https://gcris.iyte.edu.tr/handle/11147/3511

[2010]

Performance enhancement of real-time protocol

MSc Thesis by Mr. Çağan Yücel

Link: https://gcris.iyte.edu.tr/handle/11147/4022

[2008]

Solving the course scheduling problem by constraint programming and simulated annealing

MSc Thesis by Mrs. Esra Aycan

Link: https://gcris.iyte.edu.tr/handle/11147/3987

COURSES GIVEN

SEDS 501 Introduction to Data Science

The course is intended for graduate students from different disciplines.
Course web page: https://tolgaayav.gitlab.io/home/seds501/

CENG 215 Circuits and Electronics

I've been teaching this undergraduate course since 2019.
Course webpage: https://tolgaayav.gitlab.io/home/ceng215/

CENG 523 Advanced Topics of Real-Time Systems

I've given this graduate course for more than ten years. Topics include real-time operating systems, formal methods, timed automata, model checkers, verification and testing of real-time systems.
Course webpage: https://tolgaayav.gitlab.io/home/seds501/

CENG 525 Fault-Tolerant Computing

I taught this graduate course several times. Topics mostly include fault modeling, testing and redundancy techniques to achieve fault tolerance and dependancy in computer systems.
Course webpage: https://tolgaayav.gitlab.io/home/ceng525/

CENG 504 Optimization Methods

I taught this graduate course several times.
Course webpage: https://tolgaayav.gitlab.io/home/ceng504/

SEDS 514 Software Testing

I teach this graduate course on a regular basis. It is intended for graduate students from different disciplines and topics inlude software verification and testing methods.
Course webpage: https://tolgaayav.gitlab.io/home/seds514/

CENG 311 Computer Architecture

I taught this undergraduate course between 2008 and 2018.
Course webpage: https://tolgaayav.gitlab.io/home/ceng311/

HOBBIES AND INTERESTS

Classical Guitar Player I have been playing the classical guitar since I was 16 years old, and I also play the piano at a beginner level.

DIGITAL SKILLS

Project writing, project development &project management / Research and Grant Management / Programming languages: C (Advanced) , C++ (Advanced) , MATLAB (Advanced) / Python (Pytorch / Tensorflow) / Linux (Server) / operating systems / Office Tools (LibreOffice, Microsoft Office)