

Erhan Mengusoglu

CONTACT

E-mail: mengusoglu@gmail.com

KEY QUALIFICATIONS:

- Experience: Software development using Java, JavaScript, SQL, C, C++, IBM WebSphere(Application server, MQ, Message Broker), Machine Learning, Neural Networks, Complex Event Processing, Service Oriented Architecture, Model Driven Development, Speech Recognition.
- Bachelors, Masters, Phd degrees in Computer Science and Engineering.
- Good command of spoken and written English & French;
- Industrial Experience with IBM Software; Message Broker, MQ, Websphere Application Server, System Z, Operational Decision Management, Web Services, XML messaging and decision rules, event processing solutions, design-supervision and execution of test scenarios for various IBM projects, Model driven architecture, building and development of acoustic models, troubleshooting and fault reports and elimination.

EDUCATION

Faculte Polytechnique de Mons., Mons, Hainaut, Belgium

PhD in Computer Science 1999-2004

Hacettepe University , Ankara, Turkey

MSc in Computer Science 1995-1999

Hacettepe University , Ankara, Turkey

BSc in Computer Science and Engineering, 1990-1995

TEACHING

- Introduction to Computer Engineering (Engineering),
- Computer Programming in Java (Engineering),
- Computer Programming in C (Engineering),
- Object Oriented Programming and Design,
- Programming Languages,
- Software Design Patterns,
- Software Verification and Validation,
- Theory of Computation, Automata, Regular Expressions, Context Free Languages,
- Digital Image Processing,
- Assembly Language Programming,
- Speech Recognition,
- Pattern Classification,

PROFESSIONAL EXPERIENCE

Assistant Professor

February 2017 -

Hacettepe University, Computer Engineering, Ankara/Turkey.

Contact : Mehmet Onder Efe, Head of Computer Engineering : onderefe@hacettepe.edu.tr

- **Task:** Lecturing Computer Engineering courses. Research projects: Fuse-it
- **Assignments:**
 - MOSBIT, carrying out research for FUSE-IT project.

Assistant Professor

September 2015 - February 2017

University of Turkish Aeronautical Association, Ankara/Turkey.

Contact : Tansel Dokeroglu, Head of Computer Engineering : tdokeroglu@thk.edu.tr

- **Task:** Lecturing Computer Engineering courses. Research projects: Fuse-it, WaterM, Model-writer, VisCa
- **Assignments:**
 - Mantis Software, carrying out research for VisCa, ModelWriter and WaterM projects.
 - Bilkent University Computer Science Department, lecturing CS458 Software Verification and Validation course.
 - MOSBIT, carrying out research for FUSE-IT project.

Assistant Professor

2012 - 2015 (3 years)

TED University, Ankara/Turkey.

Contact : Tolga Capin, Head of Computer Engineering : tolga.capin@tedu.edu.tr

- **Task:** Preparation of Computer Engineering curriculum. Improve the university web infrastructure. Define university wide processes. Preparation of course material and lecturing.
- **Assignments:**
 - Mantis Software, preparation of **ModelWriter**, **C3PO** and **WaterM** project proposal which were eventually labelled by **ITEA** and supported by **TUBITAK**.
 - Mantis Software, working as research consultant for **ViSCa project** (Virtualization of smart cards). Architectural design and coordinator of the project for Mantis. Project started in January 2014 and will continue for 30 months.
 - Mantis Software, research consultant for **ITEA2 project DiCoMa** (Disaster Control Management). Dicoma is a project about creating a Service Oriented Open Platform for management of disaster situations in order to minimize the effects of the disaster. The partners from Israel, Spain, Finland and Turkey are working together to define a common architecture and a framework that include complex event processing, control support system and decision support system. My role in this project is to provide research guidelines and coordinate research activity for Mantis. Project has been completed on July 2014 after a successful review.
 - Mantis Software, **research coordinator for research projects**. Responsible for managing funding application processes.
 - DBE Software, leading the project proposal preparation work, for **Energy price and demand estimation using neural networks** project which was eventually funded by TUBITAK, expected to be completed by June 2015.
 - Proya Software, **WAS8.0 Training** for intermediate IBM WebSphere Application Server users from The Turkish Gendarmerie Organization.

*IBM Operational Decision Management
Functional Test Lead for System Z*

March 2012 - August 2012 (6 m)

IBM UK LTD. Winchester-UK,

Contact : Dr. Neil Simpson, Manager: Phone : +44 (0) 1962 815770

NSIMPSON@uk.ibm.com

- **Task:** Creating, supervising and **executing test (quality assurance) plans**, configuration management for IBM Operational Decision Management on System Z. **Integration tests** for Decision Server Events on system Z. **Creating tests for XML based decision rules**.
- **Assignments:**
 - In this role, as the team leader for the functional tests, I prepared test plans and quality assurance plans for IBM Decision Management product on system Z. System Z is the main-frame with zOS operating system which is architecturally very different than the distributed (PC) environment.
 - Test plans included tests for execution of Business Events part of the decision management software which is an enterprise application working on WebSphere Application Server for System Z
 - Integration tests for Business Events and Business Rules components of IBM Decision Man-

agement software were also included in the test plan

Consultant at IBM Software Services for WebSphere

May 2011 - Feb. 2012 (10m)

IBM UK LTD. Winchester-UK,

Contact : Christopher Westwood, Consultant at IBM Software Services, Manager: Business Integration IBM Software Services for Websphere Phone: + 44 1962 817305

chrisw@uk.ibm.com

- **Task: Design and implementation of business integration and solution architectures** involving different IBM products for IBM customers. WebSphere Message Broker (**XML messaging**), WebSphere MQ, WebSphere ILOG Jrules, WebSphere Business Events, WebSphere Business Monitor, WebSphere Application Server, MQ File transfer edition.
- **Assignments:** An american bank, business activity monitoring. Boots (retail). **Message broker**, microbroker architecture review and troubleshooting. A component retailer (sales and distribution, **review of software life cycle management** involving IBM message broker product), middleware migration proof of concept. A social security institution, Business event processing critical situation resolution. A bank, Document management **system architecture review**, requirement analysis. A government service, business process management **message broker integration**. A telecom company, **Business events processing architecture**.

Developer/Tester for Websphere Business Events

Jan. 2009-April 2011 (15m)

IBM UK LTD. Winchester-UK,

Contact : Noel Rooney, Developer/Tester for Websphere Software Development Engineer, +44 1962 818658

Noel_rooney@uk.ibm.com

- **Task:** Designing, developing, requirement analysis and testing (**quality assurance**) complex event processing solutions based on IBM Websphere Business Events (WBE) **which uses XML based event technologies. Developing system test scenarios** for WBE that includes many IBM products such as MQ, Message Broker, WESB, WSRP, ILOG, DB2. Beta testing of pre-release WBE product. Troubleshooting and fault management for WBE product. Leading proof of concept activity involving WBE for IBM customers. **Providing software documentation** for WBE product.
- **Assignments:**
 - My role was not only to contribute to the development, testing and requirement analysis of the product but also to work with customers in order to develop proof of concept (PoC) implementation of systems that include WBE. Some examples of such activity is as follows:
 - Monitoring of sensor devices in oil wells, IBM Industry Solutions An oil company
 - Automatic detection of oil well revenue and expense problems BP
 - Detection of meter tampering and active monitoring of energy usage An energy distribution company
 - Patient Monitoring solution for long term monitoring of diabetes patients IBM Healthcare
 - Complex Event Processing based surveillance system for high security buildings IBM Sensor Management

Research Engineer for Modelplex project

March 2007-Jan. 2009 (22 m)

IBM UK LTD. Winchester-UK,

Contact : Catherine Robinson, Research Engineer for Modelplex Pervasive & Advanced Messages Technologies Development +44 1962 815408

Catherine_robinson@uk.ibm.com

- **Task: Model Driven Architecture**, Model Based System Management related research and development in EU supported Modelplex project (www.modelplex.org). Requirement analysis, **Architecture design and implementation of monitoring and automated event pro-**

cessing for distributed devices of service provider networks. Modelplex was half supported by EU through FP6 research funding and 21 universities and companies were involved. I published several papers during my work in this project. Completion of Required Documentation deliverables for the project.

- **Assignments:** This project was a research project with huge potential impact on development practices for software companies. I have developed a domain specific language for system management for distributed devices and implemented UML profiles for the language. The profile included a SLA (Service Level Agreement) model which was verified by Telefonica (Spain) and a component model for distributed devices which provided a generic SNMP (Simple Network Management Protocol) model for monitoring remote, low resource devices.

Speech Engineer

Sep. 2005-Feb. 2007 (17 m)

IBM UK LTD. Winchester-UK,

Contact : Dr. Eric Janke, Speech Engineer Manager: UK Voice Technology Development + 44 1962 815292

Dr.eric_janke@yahoo.co.uk(leftIBM)

- **Task: Building and development of acoustic models** for embedded environment using IBM tools, improving accuracy of current **speech recognition systems**.
- **Assignments:** My role in the speech development team was to work with the development team located in the Germany and the Research team located in Florida, USA to improve the speech recognition accuracy of embedded speech recognition solutions provided to IBM customers. Building acoustic models with added noise, testing different feature extraction methods, creating acoustic models for different languages, such as Australian English, Swedish and Turkish, were the main activities I carried out during my time in the team.

Lecturer

April 2004- Sep. 2005 (17 m)

Hacettepe University Computer Science Department Ankara, Turkey

Contact : Hayri Sever sever@hacettepe.edu.tr

Task: Computer Science and Electronics Engineering Courses:

- Introduction to Programming in C (Undergraduate course Computer Engineering 1st Semester)
- Pattern Classification (Graduate course Computer Engineering)
- Structured Programming (Graduate course Informatics Institute)
- Computer Organization (Undergraduate course Electrical and Electronics Engineering 5th Semester Baskent University)
- Final Project Supervision (Undergraduate course Computer Engineering 7th Semester)
- Microprocessors (Undergraduate course Computer Engineering 8th Semester)
- Image Processing (Undergraduate course Computer Engineering 8th Semester Baskent University)
- System Programming (Low level programming) (Undergraduate course Computer Engineering 4th Semester)

Research Staff

Oct. 2003-March 2004 (6m)

Multitel, Mons-Belgium research@multitel.be

Task: Implementation of confidence measures for embedded speech recognition technology provided by Multitel Research Center which was a spin off company of TCTS Lab (Faculte Polytechnique de Mons)

Researcher

Sep. 2000-Sep. 2003 (36m)

Faculte Polytechnique de Mons, TCTS lab Mons-Belgium

Contact : Thierry Dutoit 31, Boulevard Dolez B-700 Mons Belgium +32 6537 4774 Thierry.dutoit@

umons.ac.be Working on the project ARTHUR financed by the regional government of Wallonia in Belgium. The project was carried out by 3 Belgian Universities and 3 University hospitals. The goal was to develop an architecture that will improve functioning of emergency departments of hospitals by providing a robust information model with speech/speaker recognition solution. I was carrying out my PhD thesis related research at the same time. **Task: Increase the robustness of speech recognition** in the urgency environment of a hospital. Development of speaker identification and verification system. **Documentation of speech/speaker recognition software.**

PUBLICATIONS

PATENTS

1. **Mengusoglu, E.** , Pickering, B., Extracting A System Modelling Meta-Model Language Model For A System From A Natural Language Specification Of The System, US Patent 8561014.
2. **Mengusoglu, E.** , Klinger, D., Walters, M., Zhang, X., Mc Namara, J., Conditional Probability Operator For Event Processing Systems. US patent 20130144814.

BOOKS

1. **Mengusoglu, E.**, 2014, Confidence Measures for Speech/Speaker Recognition, LAP LAMBERT Academic Publishing.
2. **Mengusoglu, E.** , H. Leich, 2003, Reconnaissance de la Parole / du Locuteur dans le Domaine Mdical, (Book Chapter) in ARTHUR, Manuel d'informatisation des urgences hospitalires, edited by Jean Herveg and Anne Rousseau.
3. **Mengusoglu, E.** , Icke, I., Yalcin T., Bilgisayar I., 1997, High School Computer course textbook. (In Turkish)
4. **Mengusoglu, E.** , Icke, I., Yalcin T., Bilgisayar II., 1997, High School Computer course textbook. (In Turkish)

SCI EXPANDED JOURNAL PAPERS

1. **Mengusoglu, E.** "Speaker Model Adaptation Based on Confidence Score." Technical Gazette 22.4 (August 2015).
2. **Mengusoglu, E.** , C. Ris, "Use of Acoustic Prior Information for Confidence Measure in ASR (Automatic Speech Recognition) Applications", Acoustic Research Letters Online, April 2005.

OTHER JOURNAL PAPERS

1. **Mengusoglu, E.** , Hayri Sever, Behnam Asefisaray, Murat Hacmerolu. " Turkce ses tanima sistemlerinde dil modeli boyutunun dogruluk oranina etkisi - How does language model size effects speech recognition accuracy for the Turkish language?." PAJES-2016: 22(2).
2. **Mengusoglu, E.** , Eralp Erdoan, A Case Study for Better Management of Forest Fire Situations using DiCoMa, A Disaster Management Framework, Journal of Balikesir University FBE 2015: 17(1).

CONFERENCE PAPERS

1. Hlia Pouyllau; Bernard Istasse; Shohreh Ahvar; Nol Crespi; Isabel Praa; Sandra Garcia Rodriguez; **Erhan Mengusoglu**, "Enhancing Critical Site Supervision with Cross-Domain Key Performance Indicators" GIIS conference 2016 Porto.
2. Ahmadlouei, A., Sever, H., **Mengusoglu, E.** (2016) Link Detection Based on Named Entity Keywords in Turkish News Corpus, In Proceedings of The Second International Conference on Big Data, Small Data, Linked Data and Open Data (ALLDATA 2016), February 21 - 25 - Lisbon, Portugal.
3. **Mengusoglu, E.** , O. Tolga Altinoz; Cloud-based Long Term Electricity Demand Forecasting using Artificial Neuro-Fuzzy and Neural Networks, IEEE ELECO 2015 - November 2015.
4. **Mengusoglu, E.** , O. Tolga Altinoz; Uzun Dnem Elektrik htiya Talep Kestiriminde Giri Deikenlerinin Performansa Etkisi, IEEE SIU 2015 - May 2015.
5. **Mengusoglu, E.** , H. SEVER, F. AKAL, S. AK; Netigma: An End User Oriented And Browser Based, Application Development Environment With The Focus Of Business Process Management For Singular As Well As Multi- Dimensional Data, Yazlm 2013; Bursa; Turkey.
6. **Mengusoglu, E.** , F. Akal, H. Sever, S. Ak, Netigma: Is Sreci Ynetiminde Son Kullanc Tarafndan Yazlm Gelitirme Ortam, Biliim 2013, Ankara, Turkey, 28-29 November 2013.
7. **Mengusoglu, E.** , B. Pickering, SOA for Distributed Device Management: Using a Control Loop for SLA Monitoring, ECMDA 2008, Model driven tool and process integration workshop.
8. B. Pickering, S. Robert, S. Menoret, **Mengusoglu, E.** , 2008, Model-driven Management of Complex Systems, MODELS 2008, Models at runtime workshop.
9. **Mengusoglu, E.** , B. Pickering, Model Based System Management for Distributed Devices, European Conference on Model Driven Architecture: Foundations and Applications, Haifa, June 2007.
10. B. Pickering, M. A. Fernndez, A. Castillo, **Mengusoglu, E.** : "A Domain-Specific Modelling Approach for Autonomic Network Management", Modelling Autonomic Communications Environments, Third IEEE International Workshop, MACE 2008, Samos Island, Greece, September 22-26, 2008. Proceedings. Lecture Notes in Computer Science, MACE 2008: 108-113.
11. E. Gil Garcia, **Mengusoglu, E.** , E. Janke, Multilingual Acoustic Models For Speech Recognition In Low-Resource Devices, Proc. ICASSP 2007, Honolulu, April 2007.
12. **Mengusoglu, E.** , "Confidence Measure Based Model Adaptation for Speaker Verification", Proc. 2nd IASTED International Conference on Communications, Internet and Information Technology, Scottsdale, AZ, USA, November 2003.
13. **Mengusoglu, E.** , C. Ris, 2001, "Use of Acoustic Prior Information for Confidence Measure in ASR Applications", Eurospeech 2001Scandinavia,, Aalborg, September 2001.
14. **Mengusoglu, E.** , O. Deroo, 2001, "Turkish LVCSR: Database Preparation and Language Modeling for an Agglutinative Language" , Proc. ICASSP 2001 Student Forum, Salt Lake City, May 2001.
15. **Mengusoglu, E.** , O. Deroo, 2000, "Confidence Measures in HMM/MLP Hybrid Speech Recognition for Turkish Language" , Proc. ProRISC'2000, Veldhoven, December 2000.
16. **Mengusoglu, E.** , H. Artuner, 1999, Using Multiple Codebooks for Turkish Phone Recognition , ISCIS14, Izmir, September 1999.

THESES

1. PhD: Confidence Measures for Speech/Speaker Recognition and Applications on Turkish LVCSR, E Mengusoglu, H Leich, Faculte Polytechnique de Mons
2. MSc: Rule Based Design and Implementation of a Speech Recognition System for Turkish Language, E Mengusoglu, H Artuner, Hacettepe University

CITATIONS

1. <https://scholar.google.com/citations?user=CRHfLuoAAAAJ&hl=en>

PROJECTS

Belgium:

ARTHUR Project (ARchitecture de Tlcommunications Hospitalires pour les services d'URgence), Faculte Polytechnique de Mons, 2000-2003. Design and develop an information processing system to collect, store and exchange information in a medical environment.

<http://www.run.montefiore.ulg.ac.be/Projects/Presentation/index.php?project=ARTHUR>

Project partners :

- UeL (Universit catholique de Louvain-la-Neuve), co-ordinator
- FPMs (Facult Polytechnique de Mons)
- FUNDP (Facults Universitaires Notre-Dame de la Paix, Namur)
- ULg (Universit de Lige)

United Kingdom:

ModelPlex Project (Modelling solution for complex software systems),

http://www.cordis.europa.eu/project/rcn/79760_en.html

MODELPLEX has three major objectives:

- Objective A: Develop an open solution for complex systems engineering improving quality and productivity;
- Objective B: Lead its industrialisation;
- Objective C: Ensure its successful adoption by the industry.

Model-driven engineering (MDE) is an approach that is gaining acceptance in several software domains with proven benefits such as cost reduction and quality improvement. However, applicability to complex systems engineering still remains a challenge. This is despite complex systems having an even greater need for model-based approaches because models can provide the necessary abstractions that enable human comprehension, communication, simulation and analysis, and synthesis of implementation artefacts for such systems.

Turkey:

- FUSE-IT - Future Unified System for Energy and Information Technology. Fuse-IT addresses the need for sustainable, reliable, userfriendly, efficient, safe and secure Building Management System (BMS) in the context of smart critical sites. A main purpose is to solve the dilemma between efficiency and security in intelligent & strategic buildings. The result of FUSE-IT will be a smart secured building system, incorporating secured share sensors, effectors and devices strongly interconnected through trusted federated energy & information networks, a core building data processing & analysis module, a smart unified building management interface and a full security dashboard. Remote multisite monitoring will be implemented, taking advantage of big data analytics. <https://itea3.org/project/fuse-it.html> -In Progress
- Dicoma Project, (Disaster Control Management), The DiCoMa project intends to dramatically improve the ability of decision makers to correctly assess disaster situations and to make better

decisions hereby saving lives.

<https://itea3.org/project/dicoma.html> –Completed

- Visca Project (Virtualization of Smart Cards), The ViSCa, Virtual Machine for SmartCard/USIM, concept is a holistic approach that comprises a centralised management utility for a secure (enterprise) single-sign-on system. A Trusted VM (Virtual Machine) for SmartCard in the cloud should be instantiated at the connected device by a secure connection only when the user has been authenticated. The main ViSCa objective is to provide a ubiquitous multidevice platform for the deployment of services that require a strong security protocol, both in the access/authentication and execution of its applications. In this sense, ViSCa offers full interoperability and full access from any user device without lacking security. The concept prevents possible attacks by third parties, guaranteeing the confidentiality of personal data, bank accounts or private information. Compared to existing approaches, management is simplified as the interface of trusted components in the cloud is identical to the one of smartcards as physical trust anchors. This new concept proposed might entail a clear benefit to end users, aimed to increase confidence in new services that require the sharing of confidential data. We therefore anticipate an increasing use of this group of innovative services, enabling their extension and related market activity.

<https://itea3.org/project/visca.html>

–In Progress

- ModelWriter Project (Text & Model-Synchronized Document Engineering Platform), The objective of the ModelWriter project is to bring a quantum leap in the productivity of technical authors (such as software or systems engineers, project managers, business developers, etc.) who are engaged in authoring documents of a technical nature. The project also aims to improve the quality (consistency, completeness) of these documents that, in turn, will enhance the quality of companies products, e.g. via a reduction of cost of product defects. Finally, ModelWriter aims also to allow companies to further exploit, recycle and valorise their own internal knowledge, which is currently left unexploited in technical documents that are seen as a sequence of words only. To achieve this, the project envisions an integrated authoring environment called "ModelWriter", which will be locally used by each author / contributor. This will combine two parts, a semantic word processor (= the "Writer" part), which resembles a typical word processor but capable of "understanding" pieces of text and transparently creating models of contents out of them, and a Knowledge Capture Tool (= the "Model" part), which resembles a spreadsheet table, or other familiar information modelling tools.

<https://itea3.org/project/modelwriter-1.html>

– In Progress

- WaterM Project (Unified Intelligent WATER Management), Only 2.5% of the worlds water is fresh water. In recent decades, the human population has increased by a factor of 3, but at the same time water demand has increased by a factor of 6. Water is a finite resource that should be carefully managed. However, more than 50% of the worlds population lives in areas with a water sustainability problem. In this regard, water industries are using SCADA technologies to support their business processes, but this is clearly not enough. To solve the water sustainability problem, which is compounded by the water process complexity, a major upheaval of the water industry is needed with the introduction of novel concepts, such as GIS integration, quality management programs or real-time data management. In this context, ICT technologies are needed to drive these challenges. The scope of the Water-M project enables the creation of new products and services to build a unified water business model that will benefit European Union water stakeholders. The Water-M project combines real-time monitoring and operational control, service-oriented approaches and event driven mechanisms in the water management domain.

<https://itea3.org/project/water-m.html>

– In Progress