

BIOGRAPHY AND LIST OF WORKS/PUBLICATIONS

BIOGRAPHY

Name and Surname: Merve Ayyüce KIZRAK

Date of Birth: 27.10.1987

Place of Birth: İstanbul/Fatih

Academic Title: Dr.

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Language (Score and Year): 70, 2019

Certifications held: University of California Berkeley, School of Information, AI Strategy Course

Profession: Artificial Intelligence, Data Governance, Computer Vision, Music Information Retrieval Analysis, Deep Learning, Machine learning

Degree	Department/Program	University	Year
Bachelor Degree	Electronics and Communications Engineering	Haliç University	2009
Master Degree	Electronics and Communications Engineering	Haliç University	2011
Master Degree	Financial Technology	Bahçeşehir University	Present
Ph.D.	Electronics and Communications Engineering / Communications Program	Yıldız Technical University	2021

Master Thesis Title (summary attached) and Thesis Advisor(s)::

Diagnosis of acute lymphocytic leukemia using kernel ridge regression method

Adviser: Dr. Figen ÖZEN

Leukemia is the most common type of cancer throughout the world. It is seen both in children and adults. The rate of occurrence of leukemia varies between 28% to 33% according to age, gender and other specifications. Looking at the picture today, it can be concluded that there will be more leukemia cases in the future. Even though leukemia can be a fatal disease, early diagnosis and treatment can help prevent serious consequences. In this thesis, an efficient pattern recognition algorithm to identify the

acute lymphocytic leukemic (ALL) cells is presented. Children are more likely to develop acute lymphocytic leukemia. It can be treated when diagnosed in time. If not treated properly, it can be fatal. In the study, morphological preprocessing techniques have been applied to both ALL and healthy cells. Later, using the gray-level co-occurrence matrix (GLCM) method, features are extracted. Statistical values obtained from GLCM have been classified using kernel ridge regression. Finally a decision as to whether the sample is acute lymphocytic leukemic or healthy is made. The details of the algorithm and the performance analyses are included. Simulations have been done using the MATLAB program.

Ph.D. Thesis/S. Proficiency Study/Medical Specialization Thesis Title (summary attached) and Advisor(s):

Crowd Analysis in Video Images

Adviser: Doç. Dr. Bülent BOLAT

World; In addition to excessive population growth, while passing through tests such as terrorism, war, and epidemics, ensuring the security of public spaces is becoming an increasingly difficult issue. By using images obtained from video imaging, it is aimed to perform crowd density analysis most appropriately in practical matters such as controlling and arranging public spaces. Crowd analysis is an important and recent research subject that has a widespread impact on academic and practical life. In this study, an original and effective method is proposed by using deep learning approaches, which is one of the sub-topics of artificial intelligence. The first results of the study were obtained with a combination of CNN-based parallel architecture, Gauss-YOLOv3, and well-known KNN methods. Detailed information was given about the datasets of UCF-QNRF, UCF_CC_50, UCSD, ShanghaiTech Part A, WorldExpo'10, and PETS2009 in the literature for crowd analysis. Tests were performed with these datasets to demonstrate that the success of the study was generalizable. Six different video sequences in the PETS2009 dataset were used to predict crowd behavior change in the study. Accuracy performance was between 83.2% and 96.4%. These results were shown to be comparable to their counterparts in the literature. At the end of the study, a two-column deep learning architecture with attention-based convolution and capsule network module and using negotiated routing algorithm is proposed. To show the performance of the proposed method comprehensively, MAE and MSE evaluation metrics were compared with current studies and the improvement rates according to their closest performance were calculated. The proposed method with improvement shows that it is effective and generalizable for this problem when compared with the state-of-the-art approaches in the literature. The results obtained are as follows: 2.18% MSE in UCF-QNRF; 2.33% MAE and 1.68% MSE at UCF_CC_50; 8.46% MAE and 7.03% MSE in UCSD; 4.69% MAE and 3.94% MSE in ShanghaiTech Part A; 6.94% MAE at WorldExpo'10. The proposed capsule network-based deep learning architecture; shows that position and orientation information can be used in crowd analysis without using motion information such as optical flow in future studies for behavioral analysis.

Works:

Work Title	Institution of Work	Year
Research Assistant	Haliç University	2009-2019
Research Assistant	Bahçeşehir University	2019-halen
AI Specialist	The Presidency of the Republic of Türkiye (full time assignment)	2019-halen

Managed Master's Theses:

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Administered Doctoral Theses / Proficiency in Art Studies:

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Duties Performed in Projects:

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Administrative Duties:

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Memberships to Scientific Organizations:

Awards: 2021 TeknoFest Artificial Intelligence in Transportation Competition First Place.
(<https://huma-teknofest.github.io/>)

Undergraduate and graduate level courses given in the last two years (If offered, summer courses will also be added to the table):

Academic year	Semester	Name of Course	Weekly Time		Number of Students
			Theory	Practice	
2020-2021	Fall	Hukuk ve Yapay Zeka (Özyeğin University, Master of Law)	3	0	5
	Spring	CMP 1000 AI for EveryonePRE-U	3	0	25
2021-2022	Fall	AIN 1008 Freshman Seminar	1	0	136
	Spring	AIN 2008 Computers & Ethics	3	0	41

WORKS-PUBLICATIONS**A. Articles published in international peer-reviewed journals:**

A1 Crowd Density Estimation by Using Attention Based Capsule Network and Multi-Cloumn CNN, IEEE Access Journal, 2021, KIZRAK, M. A. and BOLAT, B.

A2 A Musical Information Retrieval System for Classical Turkish Music Makams, SAGE Journals Publishing Simulation Transaction, 2017, KIZRAK, M. A. and BOLAT, B.

B. Papers presented at international scientific meetings and published in proceedings books:

B1. Cluster-Based Monitoring and Location Estimation for Crowd Counting, ID Conf., Progress in Intelligent Decision Science, Springer, 2021, KIZRAK, M. A. and BOLAT, B.

B2. Classification of Recyclable Materials Using Efficient Deep Learning Models and Benchmarking of GPU Performance, ID Conf., Progress in Intelligent Decision Science, Springer, 2021, KÖMEÇOĞLU, Y. and KIZRAK, M. A.

B3. Differential Privacy Practice on Diagnosis of COVID-19 Radiology Imaging Using EfficientNet, INISTA 2020, MUFTUOĞLU, Z., KIZRAK, M. A. and YILDIRIM, T.

B4. RecycleNet: Intelligent Waste Sorting Using Deep Neural Networks, INISTA 2018, BIRCANOĞLU, C., ATAY, M., BESER, F., GENÇ, O. and KIZRAK, M. A.

B5. A Novel Approach for People Counting and Tracking From Crowd Video, INISTA 2017, KIZRAK, M. A. and BOLAT, B.

B6. Classification of classic Turkish music makams by using deep belief networks, INISTA 2016, KIZRAK, M. A. and BOLAT, B.

B7. Classification of Classic Turkish Music Makams, INISTA 2015, KIZRAK, M. A. and BOLAT, B.

B8. Classification of EEG signals by using support vector machines, INISTA 2013, BAYRAM, K.S., KIZRAK, M. A. and BOLAT, B.

B9. Automatic Acute Lymphocytic Leukemia Diagnosis Based on Kernel Ridge Regression Method, Conference: AWERProcedia Information Technology and Computer Science, Volume: Vol 2 (2012), KIZRAK, M. A. and ÖZEN, F.

B10. A new median filter based fingerprint recognition algorithm, WCIT,2010, KIZRAK, M. A. and ÖZEN, F.

B11. Circularly Polarized Microstrip Patch Antenna with Slits, Conference: 26th Annual Review of Progress in Applied Computational Electromagnetics April 26 - 29, 2010, KIZRAK, M. A., İMECİ, Ş.T. and ŞİŞMAN, İ.

C. National/international books or chapters in books:

C1. Written national/international books:

C1.1. Akut Lenfosit Lösemisinin Çekirdek Sağrı Regresyonu Yöntemiyle Tanınması (Turkish Edition), LAP LAMBERT Academic Publishing, 2017, KIZRAK, M. A.

C2. Chapters in national/international books:

C2.1. Data sharing and privacy issues arising with COVID-19 data and applications, Data Science for COVID-19, Volume 2: Societal and Medical Perspectives, 2022, MÜFTÜOĞLU, Z., KIZRAK, M. A., and YILDIRIM, T.

C2.2. Privacy-Preserving Mechanisms with Explainability in Assistive AI Technologies, Advances in Assistive Technologies, 2022, MÜFTÜOĞLU, Z., KIZRAK, M. A., and YILDIRIM, T.

C2.3. Limitations and challenges on the diagnosis of COVID-19 using radiology images and deep learning, Data Science for COVID-19. 2021 : 91-115, KIZRAK, M. A., MÜFTÜOĞLU, Z. and YILDIRIM, T.

C2.4. Sağlıkta Yeni Nesil Teknolojiler, Bölüm: Sağlıkta Yapay Zekâ (in Turkish), Akademisyen Publisher, 2019, KIZRAK, M. A.

D. Articles published in national peer-reviewed journals:nan makaleler:

D1. Predictive Maintenance of Aircraft Motor Health with Long-Short Term Memory Method, International Journal of Informatics Technologies, 2019, KIZRAK, M. A. and BOLAT, B.

D2. A Comprehensive Survey of Deep Learning in Crowd Analysis, International Journal of Informatics Technologies, 2018, KIZRAK, M. A. and BOLAT, B.

E. Papers presented at national scientific meetings and published in proceedings books:

E1. Voting-Based Multiple Classification Approach for Turkish News Texts, ASYU 2019, BULUZ, B., KÖMEÇOĞLU, Y. and KIZRAK, M. A.

E2. Deep and Wide Convolutional Neural Network Model for Highly Dense Crowd, ASYU 2019, KIZRAK, M. A. and BOLAT, B.

E3. Recognition of Sign Language using Capsule Networks, SIU 2018, BESER, F. KIZRAK, M. A., BOLAT, B. and YILDIRIM, T.

E4. DVB-T'de OFDM Performans Analizi, URSİ, 2010, KIZRAK, M. A., BAYRAM, K.S., ZEYTİNOĞLU, A. Z. and İMECİ, Ş.T.

E5. A New Way of Looking of Fingerprint Recognition Median-Filtering Fingerprint Recognition Algorithm (HMFA), HABTEKUS, 2009, KIZRAK, M. A. and ÖZEN, F.

F. Art and design events:

F1.

G. Other PublicationsDiğer yayınlar:

(All works that do not fall into the categories in the above articles and are to be specified will be specified under this article.)

G1.