# Ali Mert Ertuğrul


**CONTACT INFORMATION**

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**RESEARCH INTERESTS**

Data Science, Machine Learning, Deep Learning, Spatio-temporal Modeling & Forecasting, Event Analytics

**PERSONAL INFORMATION**

**Place and date of birth:** Konya, 30/06/1988
**Nationality:** Turkish
**Gender:** Male
**Languages:** English (Proficient), Turkish (Native)

**COMPUTER SKILLS AND ABILITIES**

**Programming**

Python, Java, C, C++, Haskell, Scheme

**Analytics**

Tensorflow, PyTorch, R, Matlab, Keras, Spark, Scikit-learn, Pajek, Weka

**Web Development**

JavaScript, PHP, ASP, ASP.NET, HTML, CSS, JQuery, JointJS, XML, JSON

**Database & Data Access**

MySql, PostgreSQL, Elasticsearch, MSSql, SQL

**ACADEMIC AND WORK EXPERIENCE**

**Postdoctoral Associate** **01/2020 - current**
PICSO Lab
School of Computing and Information, University of Pittsburgh

- Leading and conducting research on analysis and spatio-temporal modeling and prediction of online information campaigns and misinformation for cross-topics, cross-platforms in social media (e.g. forecasting of attention to campaigns, social media objects).
- Collaborating with researchers from Australian National University (ANU) in a project, which is funded by Air Force Office of Scientific Research (AFOSR).
- Utilizing and developing various machine learning and data science methods including social network analysis, community detection, text mining, label propagation, and prediction.
- Employing a number of frameworks, tools and libraries including PyTorch, Scipy, Scikit-learn for machine learning and data analysis; Elasticsearch for data access & integration; Spark for big data processing and Networkx for graph mining.
- Weekly supervising and monitoring the progress of several M.Sc. and Ph.D. students, and helping identify their weekly tasks.

**Visiting Scholar** **09/2017 - 12/2019**
PICSO Lab
School of Computing and Information, University of Pittsburgh

- Proposed and developed novel deep spatio-temporal neural networks for forecasting protest events from social media data, and opioid overdose events from real-time crime data.
- Designed, developed and implemented all steps of data science pipeline from data collection and analysis, feature extraction, to model development to visualization.
- Employed RNNs (particularly LSTM and GRU), autoencoders, Seq2Seq, ANNs, attention mechanism as the building blocks for the proposed models as well as the traditional prediction models (e.g. logistic regression, ARIMA, VAR, SVR) and state-of-the-art methods for comparison.
- Involved in a neural network based anomaly detection project to develop an unsupervised method that leverages LSTM autoencoders and hypersphere learning to detect anomalies regardless of the application domain.
- Took part in a project funded by DARPA to understand group bias in social media by learning a distributed word representation incorporating lexicon knowledge. Developed and implemented various modules including label propagation in signed network, lexicon-aware word embedding, document classification and natural language processing (NLP).
- Worked with various machine learning frameworks and libraries including PyTorch, Tensorflow, Keras, Scikit-learn to implement the proposed models, and used R for statistical analysis and visualization.

**Research and Teaching Assistant** **12/2013 - 10/2017**
Department of Information Systems, Middle East Technical University

- Worked on several machine learning projects on web data. Led and developed projects for sentiment analysis, event detection and document classification on social media.
- Employed various tools and frameworks to perform data collection, data analysis, classification and clustering using PyTorch, Tensorflow, Deeplearning4j, Scikit-learn and Django.
- Implemented methods for classification using LSTMs, CNNs, SVM, logistic regression; and clustering including hierarchical clustering methods (e.g. DB-SCAN) and K-means.
- Proposed and developed cloud-based collaborative process modeling tool using Django, AWS, JointJS.
- Worked as a teaching assistant for Software Engineering and Software Design Patterns courses. Gave recitations and prepared and evaluated the homeworks.

**Visiting Ph.D. Student** **07/2016 - 09/2016**
Web Information Systems Group, Delft University of Technology

- Conducted research and developed a user modeling pipeline for studying polarized political events (in particularly elections) in social media.
- Implemented several modules including data crawling, bot detection, demographic knowledge extraction (using REST based service APIs), and political leaning and election outcome prediction (using SVM and logistic regression).

**Researcher and Analyst** **11/2014 - 12/2015**
Bilgi Group, Ankara, Turkey

- Worked as a part-time researcher and analyst, and involved in several process improvement (ISO 15504), process analysis and modeling projects in governmental organizations.
- Worked in identification of high level functional requirements of software that supports the processes in these projects.

- Developed and implemented reporting modules for the process modeling tools.

**R&D Software Engineer** **10/2011 - 09/2013**
Arcelik R&D METU-Technopolis, Ankara, Turkey

- Worked as an R&D software engineer for two years in consumer electronics industry. Gained experience in almost each phase of software development life-cycle from requirement elicitation to software development to software testing.
- Worked as both backend and frontend developer. Designed and implemented web applications (e.g. Facebook, banking app) and application store for smart connected TVs using Javascript, HTML, CSS, jQuery and Django framework.
- Worked in and led a project for cloud-based personal video recorder system and its web application using Django, Javascript, HTML, CSS, jQuery.
- Designed and implemented backend modules for new generation electronic cash register systems using Django framework.

**Intern** **07/2009 - 08/2009**
TAI - Turkish Aerospace Industries, Inc., Ankara, Turkey

## EDUCATION

**Middle East Technical University (METU)**, Ankara, Turkey

Ph.D., Department of Information Systems, December 2019

M.Sc., Department of Information Systems, August 2015

B.Sc., Computer Engineering Department, June 2011

## HONORS & AWARDS

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|---|---|
| High honor graduation, Ph.D. in Department of Information Systems, METU | **2019** |
| Course Performance Award, Department of Information Systems, METU | **2017** |
| High honor graduation, M.Sc. in Department of Information Systems, METU | **2015** |
| Ranked $942^{nd}$ among ~1.7M examinees in Turkish University Entrance Examination | **2005** |

## PRESS

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|---|---|
| AI can predict opioid overdoses from crime and socioeconomic data, [VentureBeat] | **05/2019** |
| AI Offers Insights on the Opioid Crisis, [Seeflection] | **05/2019** |

## PROJECTS

**Linking Online Attention to Measurable Actions.** **01/2020 - current**
Air Force Office of Scientific Research (AFOSR)

**TRIBAL: A Tripartite Model for Group Bias Analytics.** **07/2018 - 05/2019**
DARPA Understanding Group Biases (UGB) Disruptioneering Program

**Software Agility Assessment Reference Model.** **04/2014 - 04/2016**
The Scientific and Technological Research Council of Turkey (TUBITAK) (Project no: 113E528)

## CERTIFICATES

Course Certificate of online course Neural Networks and Deep Learning by Andrew Ng.
Course Certificate of online course Machine Learning by Andrew Ng.
Course Certificate of online course Process Mining: Data science in Action by Professor dr.ir. Wil van der Aalst.
CCFL - Certified COSMIC at Foundation Level by Common Software Measurement International Consortium

JOURNAL PUBLICATIONS

[1] **A. M. Ertugrul**, Y.-R. Lin, W.-T. Chung, M. Yan, A. Li, Activism via attention: interpretable spatiotemporal learning to forecast protest activities, *EPJ Data Science*, 2019.

CONFERENCE PUBLICATIONS

[2] M. Yan, Y.-R. Lin, R. Hwa, **A. M. Ertugrul**, M. Guo, W.-T. Chung, MimicProp: Learning to Incorporate Lexicon Knowledge into Distributed Word Representation for Social Media Analysis, *International AAAI Conference on Web and Social Media (ICWSM)*, 2020.

[3] **A. M. Ertugrul**, Y.-R. Lin, T. Taskaya-Temizel, CASTNet: Community-Attentive Spatio-Temporal Networks for Opioid Overdose Forecasting, *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)*, 2019.

[4] W.-T. Chung, Y.-R. Lin, A. Li, **A. M. Ertugrul**, M. Yan, March with and without Feet: The Talking about Protests and Beyond, *10th International Conference on Social Informatics (SocInfo)*, 2018.

[5] X. Teng, M. Yan, **A. M. Ertugrul**, Y.-R. Lin, Deep into Hypersphere: Robust and Unsupervised Anomaly Discovery in Dynamic Networks, *27th International Joint Conference on Artificial Intelligence (IJCAI)*, 2018.

[6] **A. M. Ertugrul**, Y.-R. Lin, C. Mair, T. Taskaya Temizel, Forecasting Heroin Overdose Occurrences from Crime Incidents, *11th International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) - Opioid Challenge*, 2018.

[7] R. Napoli, **A. M. Ertugrul**, A. Bozzon, M. Brambilla, A User Modeling Pipeline for Studying Polarized Political Events in Social Media, *KDWEB Workshop 2018, co-located with ICWE 2018*, 2018.

[8] **A.M. Ertugrul**, P. Karagoz. Movie Genre Classification from Plot Summaries using Bidirectional LSTM. *IEEE International Conference on Semantic Computing (ICSC)*, 2018.

[9] **A.M. Ertugrul**, B. Velioglu, P. Karagoz. Word Embedding based Event Detection on Social Media. *12th International Conference on Hybrid Artificial Intelligence Conference (HAIS)*, 2017.

[10] **A.M. Ertugrul**, I. Onal, C. Acarturk. Does the Strength of Sentiment Matter? A Regression based Approach on Turkish Social Media, *22nd International Conference on Natural Language & Information Systems (NLDB)*, 2017.

[11] **A.M. Ertugrul**, O. Demirors. A Method for Modeling Business Processes in a Role-based and Decentralized Way, *8th International Conference on Subject-Oriented Business Process Management (S-BPM)*, 2016.

[12] **A.M. Ertugrul**, O. Demirors. An exploratory study on role-based collaborative business process modeling approaches, *7th International Conference on Subject-Oriented Business Process Management (S-BPM)*, 2015.

[13] **A.M. Ertugrul**, G. Yilmaz, M. Salmanoglu, O. Demirors. The Effect of Highlighting Error Categories in FSM Training on the Accuracy of Measurement, *Joint Conference of International Workshop on Software Measurement and the International Conference on Software Process and Product Measurement (IWSM-MENSURA)*, 2014.

[14] **A.M. Ertugrul**, I. Onal. RemindMe: An Enhanced Mobile Location-Based Reminder Application, *2nd International Conference on Future Internet of Things and Cloud (Fi-Cloud)*, 2014.

[15] I. Onal, **A.M. Ertugrul**, R. Cakici. Effect of Using Regression on Class Confidence Scores in Sentiment Analysis of Twitter Data, *5th ACL Workshop on Computational Approaches to Subjectivity, Sentiment and Social Media Analysis (WASSA)*, 2014.

NATIONAL CONFERENCE PUBLICATIONS

[16] I. Onal, **A.M. Ertugrul**. Effect of using regression in sentiment analysis. *22nd Signal Processing and Communications Applications Conference (SIU)*, 2014. (in Turkish).

[17] O.R. Yurum, O.O. Top, **A.M. Ertugrul**, O. Demirors. Yazılım Süreç Değerlendirme Araçlarının Karşılaştırılması: Bir Çoklu Durum Çalışması. *8th National Software Engineering Symposium (UYMS)*, 2014. (in Turkish).

[18] **A.M. Ertugrul**, I. Onal. Çeşitli Konum Etiketleme Opsiyonlarıyla Zenginlestirilmiş Yeni Bir Konum Bazlı Hatırlatma Uygulaması, *8th National Software Engineering Symposium (UYMS)*, 2014. (in Turkish).

THESES

[19] **A.M. Ertugrul**. Interpretable Spatio-Temporal Networks for Modeling and Forecasting Societal Events. *Ph.D. Thesis, Department of Information Systems, Middle East Technical University*, 2019.

[20] **A.M. Ertugrul**. ROADMAP: A Novel Method for Role-based and Decentralized Process Modeling. *M.Sc. Thesis, Department of Information Systems, Middle East Technical University*, 2015.