Analysis of the Small Repeating Earthquakes using OBS data in the Marmara Sea Region
by Nilay Başarır Baştürk

Abstract: The high seismicity of the Marmara region is mostly controlled by the North Anatolian Fault, which runs from East to West of Turkey, for over 1500 kilometers. The seismic activity is caused by a westward earthquake migration since 1939 on the North Anatolian Fault Zone (Barka, 1996; Hubert-Ferrari et al., 2000; Parsons et al., 2000). The historical earthquake sources show that the Marmara region has witnessed many destructive earthquakes in the past, caused by the North Anatolian Fault Zone (Başarır Bastürk et al., 2017). 1912, 1939, 1999 and 2011 earthquakes occurred on the Ganos Fault Zone, was one of the largest earthquakes in the western Marmara Sea. The 1999 İzmit Earthquake struck the eastern part of the area, and it was one of the most devastating events that occurred on the western portion of the North Anatolian Fault Zone. The fault segment between the western and eastern parts of the area is defined as a "seismic gap" (Arminio et al.,2005). Thus, it is expected that approximately 80-120 km long part of the North Anatolian Fault, passing through the Marmara Sea, will be broken due to the increasing stress accumulation after the 1999 İzmit Earthquake. Observations of the small earthquakes with the sensitive seismographs and associated these earthquakes with the fault motions are important to investigate the fault zone in detail. Furthermore, the search for the small repeating events will enable us to find out if there is a slow slip in this area. This knowledge is crucial to understand whether the rupture will occur in one segment of the fault or not, and how much displacement this rupture will produce. In this study, the relocation process has been performed by manual picking of P and S phases using the catalog of small earthquakes recorded by ocean-bottom seismometers for the time period between September 2014 and July 2015, given in Yamamoto et al.,(2017). In addition to this, new earth tremor has been detected for the next period from July 2015 to April 2016 by using STA/LTA earthquake detection method. The newly-detected events were localized and a catalog of small earthquakes has been created. The preliminary location results indicate high micro-seismicity in the Central Basin, while Kumburgaz and Çınarcık Basins show less seismicity. The created database of the small events with their physical and characteristic properties will provide insights in terms of the creeping and locking areas in detail of the region. The objective of this study is to analyze the seismic signals received from the ocean-bottom seismographs and detect the small events to comprehend the properties of the fault and the slip that occurred on the western portion of the North Anatolian Fault in the Marmara Sea.

Bio: Nilay Başarır Baştürk is a Ph.D. student in the Department of Geophysics at Kandilli Observatory & Earthquake Research Institute (KOERI), Bogazici University. She obtained a B.S degree (2007) in Geophysical Engineering from Canakkale 18 Mart University, Turkey. She got a MSc degree (2011) from Bogazici University. She participated in BAP (Scientific Research Project) from 2009 to 2011, named as "Digitizing the Seismic Traces Using Vectorization Method". She has been also involved in NESAP 2012-2023 (National Earthquake Strategy and Action Plan), to create a digital database containing historical earthquakes in Turkey. She has also worked in Marsite and Mardim Projects. Her scientific research areas are historical seismology, seismic waveform analysis and calculation of the seismic parameters.

Wearable Based Authentication
by Deniz Ekiz

Abstract: The use of cloud services that process privacy-sensitive information such as digital banking, pervasive healthcare, smart home applications requires an implicit continuous authentication solution which will make these systems less vulnerable to the spoofing attacks. Physiological signals can be used for continuous authentication due to their personal uniqueness. Ubiquitous wrist-worn wearable devices are equipped with photoplethysmogram sensors which enable to extract heart rate variability (HRV) features. These devices can be used for continuous physiological authentication, for enhancing the security of the cloud, edge services, and IoT devices. A system that is suitable for the smartband framework comes with new challenges such as relatively low signal quality and artifacts due to placement which were not encountered in full lead electrocardiogram systems

Bio: Deniz Ekiz received the M.S. degree from the Department of Computer Engineering, Bogazici University, Turkey, in 2019, where he is currently pursuing the Ph.D. degree. His research is focused on the health-related applications of wearable technology.

Learning from Human Demonstrations using Deep Neural Networks
by Muhammet Yunus Şeker

Abstract:Conditional Neural Movement Primitives (CNMP) is designed as a robotic movement learning and generation system built on top of a recent deep neural architecture, namely Conditional Neural Processes (CNP). Based on CNP, CNMP extracts the prior knowledge directly from the training data by sampling observations from it and uses it to predict a conditional distribution over any other target points. CNMP specifically learns complex temporal multi-modal sensorimotor relations in connection with external parameters and goals; produces movement trajectories in joint or task space; and executes these trajectories through a high-level feedback control loop. However, as a common point in most of the deep neural network architectures, it suffers from generalization that is outside of the training distribution. To propose a solution to that, we also propose Adaptive Conditional Neural Movement Primitives (ACNMP) that allows efficient policy improvement in novel environments and effective skill transfer between different agents. This is achieved through exploiting the latent representation learned by the underlying Conditional Neural Process (CNP) model, and simultaneous training of the model with supervised learning (SL) for acquiring the demonstrated trajectories and via RL for new trajectory discovery.

Bio: M. Yunus Şeker is a first year PhD student in the Computer Engineering department at Bogaziçi University, under the supervision of Assist. Prof. Emre Uğur. He also received his B.S. and M.S. in computer engineering program from Bogaziçi University. He is a research assistant in Colors Lab (Cognition, Learning and Robotics). He worked as a research assistant in IMAGINE, EU H2020 Project which aims to enable robots to understand the structure of their environment and how it is affected by their actions, between the years of 2017-2020. He is currently working as a scholarship / researcher at TAM Project. His research aim is to develop and enhance advanced methods for Robot Learning (affordance learning, action-effect prediction, learning from demonstration, symbolic learning and planning) using deep neural networks and other state-of-the-art methods.

Weighted Convolutional Neural Network for Sentiment Analysis
by Ali Erkan

Konu Başlıklı: People use the world wide web heavily to share their experience with entities such as products, services, or travel destinations. Texts that provide online feedback in the form of reviews and comments are important to make consumer decisions. These comments create a valuable source that can help companies to measure satisfaction and improve their products or services. Sentiment analysis is the task of identifying and categorizing opinions expressed in such text fragments. By using Convolutional Neural Networks includes different word embeddings with non-static weights as the features, the opinions are extracted.

Bio: Ali Erkan is a Ph.D. candidate in Computer Engineering Boğaziçi University. He holds M.Sc in Software Engineering from Boğaziçi University and M.Sc. and B.Sc. in Industrial Engineering from Bilkent University. His Ph.D. studies focus on the natural language processing, machine learning, sentiment analysis. He has several years of experience as a software engineer in different companies.