



AI&ML SUMMER WORKSHOP

- Seminars will be held on 9-19 June 2020
- Registration form: <https://forms.gle/NHMT3SP5qoDcBEiL8>
- Zoom meeting: <https://us04web.zoom.us/j/74672124517?pwd=aE9nRGpOYlFET3BXWXd0N3FpVnNadz09>
- Meeting ID: 746 7212 4517, Password : 0uvN2X
- Workshop materials: <https://www.dropbox.com/sh/68o64uz2x3pgpa0/AAD1OwdjsVswb6bl3dQkOMmQa?dl=0>

A number of outstanding results have been recently achieved in the areas of Artificial Intelligence, Machine Learning, and large Neural Networks. During a series of workshops on AI and ML, you will be able to understand what they are and how they solve problems, ask questions and try to complete training exercises.

The seminars are conducted under the auspices of the ACeSYRI (Erasmus +) project. SU (ICIT) is the main organizer of the event held in cooperation with the ICT MES RK and the International Academy of Informatization. ①

THE WORKSHOPS WILL ADDRESS THE FOLLOWING FOUR GROUPS OF ISSUES:



1. BASIC THEORY

– classic machine learning algorithms. In this part, we will review the basic principles of learning programs development. Some knowledge on linear algebra and Python is highly appreciated.



3. DEEP LEARNING MODELS

Here we will briefly discuss the recognition of faces and objects, image and speech processing techniques.



2. EXAMPLES

of machine learning applications. In this section, we will examine the machine learning applications in various fields.



4. IDEOLOGY

The lecture "Evolution of information systems" is dedicated to this issue.

Due to time constraints, the 3rd and 4th points are scheduled to be discussed during the next (Fall) series of seminars (expected in September-October).

THERE ARE TWO LEVELS OF CERTIFICATION:



FOR PARTICIPANTS.

Seminar participants can limit themselves to listening to lectures and, if desired, answer the test questions.



FOR LISTENERS.

Listeners answer test questions and perform exercises to increase their proficiency in machine learning methods.



Participants and listeners will be certified based on learning outcomes.

①

Workshop leader - prof. Mukhamediev R,
assistents: Symagulov Adilkhan, Baimagambetova Dinara



LIST OF AI&ML WORKSHOP MAIN TOPICS.

PART 1. FUNDAMENTALS OF MACHINE LEARNING

			End time is approximate.
1	9/06	AI&ML. Intro to machine learning. Supervised & Unsupervised learning. Predictions. Linear regression. Python tools for data science.	15.30-17.00
2	10/06	Supervised learning. Linear regression by numpy. Polynomial regression.	ML_lab00_linear regression by numpy 15.30-17.00
3	10/06		ML_Lab01_Linear regression; ML_lab02_polynomial regression
4	11/06	Supervised learning. Classification. Logistic regression.	ML_lab03_logistic regression 20.30-22.00
5	12/06	K nearest neighbors & SVM classifiers	ML_lab04_K Neighbors Classifier; ML_lab06_Support vector machines 15.30-17.00
6	13/06		BAI_L11_Test_logRegByNumpy.doc 11.00-13.00
7	15/06	Evaluation of classifiers & regressors	ML_KCT_Lab16_Assignment-3-Evaluation 15.30-17.00
8	16/06	Artificial neural networks, learning algorithms, multi layer perceptron for classification tasks.	ML_lab07_MLP_classifier 20.30-22.00
9		Dimensionality Reduction, Principal Component Analysis *	ML_lab08_Principal Component Analysis
10		"Silver bullet of machine learning"- XGBoost. *	ML_Lab11_Intro to XGBoost
11		Object detection. *	
12		Face verification and face recognition. Neural style transfer *	
13		LSTM, RNN for speech recognition *	
14		Interpretation of "black boxes" of machine *	

ЧАСТЬ 2. ВОПРОСЫ ПРИКЛАДНОГО ПРИМЕНЕНИЯ МАШИННОГО ОБУЧЕНИЯ.

15	17/06	Intro to deep learning. Convolutional Neural Networks. (Martin Lukac , Associate Professor, Nazarbayev University, Department of Computer Science)	15.30-17.00
16	18/06	Knowledge Discovery and Fuzzy Decision Tree. (профессор Левашенко В. Жилинский Университет, Словакия)	15.30-17.00
17	18/06	Natural Language Processing — обзор и анализ кейса по мониторингу СМИ (SU PhD student Kirill Yakunin)	15.30-17.00
18	19/06	"High Performance Computing for BigData Clustering" (Senior researcher of IICT MES RK Rustam Musabayev)	15.30-17.00
19	19/06	"Как узнать литологический состав пород при добыче полезных ископаемых?" (Riga Technical University PhD student Yan Kuchin)	15.30-17.00
20		"Как распознавать предметы?" Демонстрация последних достижений в области распознавания объектов *	
21		Как распознать попытки кражи денег с электронных карт? *	
22		"Как исследовать социальные сети?" *	
23		Evolution of information systems. *	

* The topics of the next cycle of workshops (Fall)



Notes.

We do not expect to turn our participants and listeners into programmers. However, we will try to explain the limits of applicability and capabilities of artificial intelligence in solving your problems.

The seminars are open to all. For successful participation in the seminars, it is advisable for student to have a computer with Anaconda installed to analyze the program code and solve basic problems.

The deadline for the submission of the results of laboratory works is June 24.