

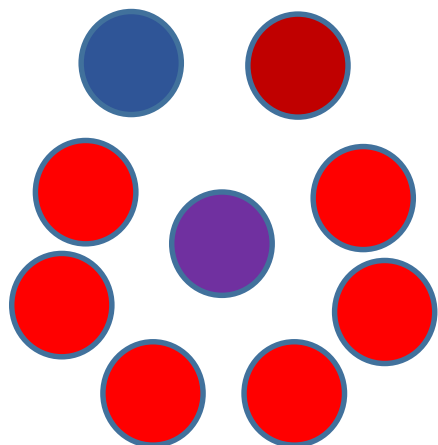
BIOMEDICAL IMAGE ANALYSIS

#BioMed #R&D #R&I #Medicine
#ComputerScience #DataScience
#Synergy #Ecosystem #VFU
#MedUniVarna #Varna #co-supervision
#OpenScience #VarnaCityofKnowledge

TEAM MEMBERS >



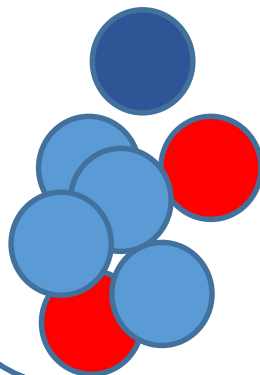
2019



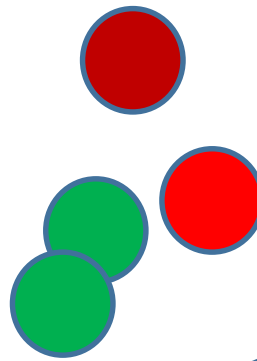
**ADVANCED COMPUTATIONAL
BIOIMAGING**

12-2019

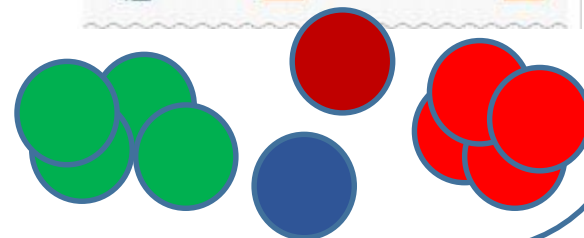
MedUni



VFU



Data Science Webinar
2018



**ПРЕДЛОЖЕНИЕ ЗА КОЛЕКТИВНА НАГРАДА "ВАРНА"
В СФЕРАТА НА НАУКАТА И ВИСШЕТО ОБРАЗОВАНИЕ,
НАУЧНА ОБЛАСТ „ПРИРОДНИ НАУКИ“ ЗА НАУЧЕН КОЛЕКТИВ В СЪСТАВ**

ДОЦ. Д-Р ГАЛИНА ДИМИТРОВА МОМЧЕВА-ГЪРДЕВА
ВАРНЕНСКИ СВОБОДЕН УНИВЕРСИТЕТ "ЧЕРНОРИЗЕЦ ХРАБЪР"

ДОЦ. Д-Р СТОЯН ПАВЛОВ ПАВЛОВ
МЕДИЦИНСКИ УНИВЕРСИТЕТ "ПРОФ. Д-Р ПАРАСКЕВ СТОЯНОВ" - ВАРНА

ПРОЕКТ

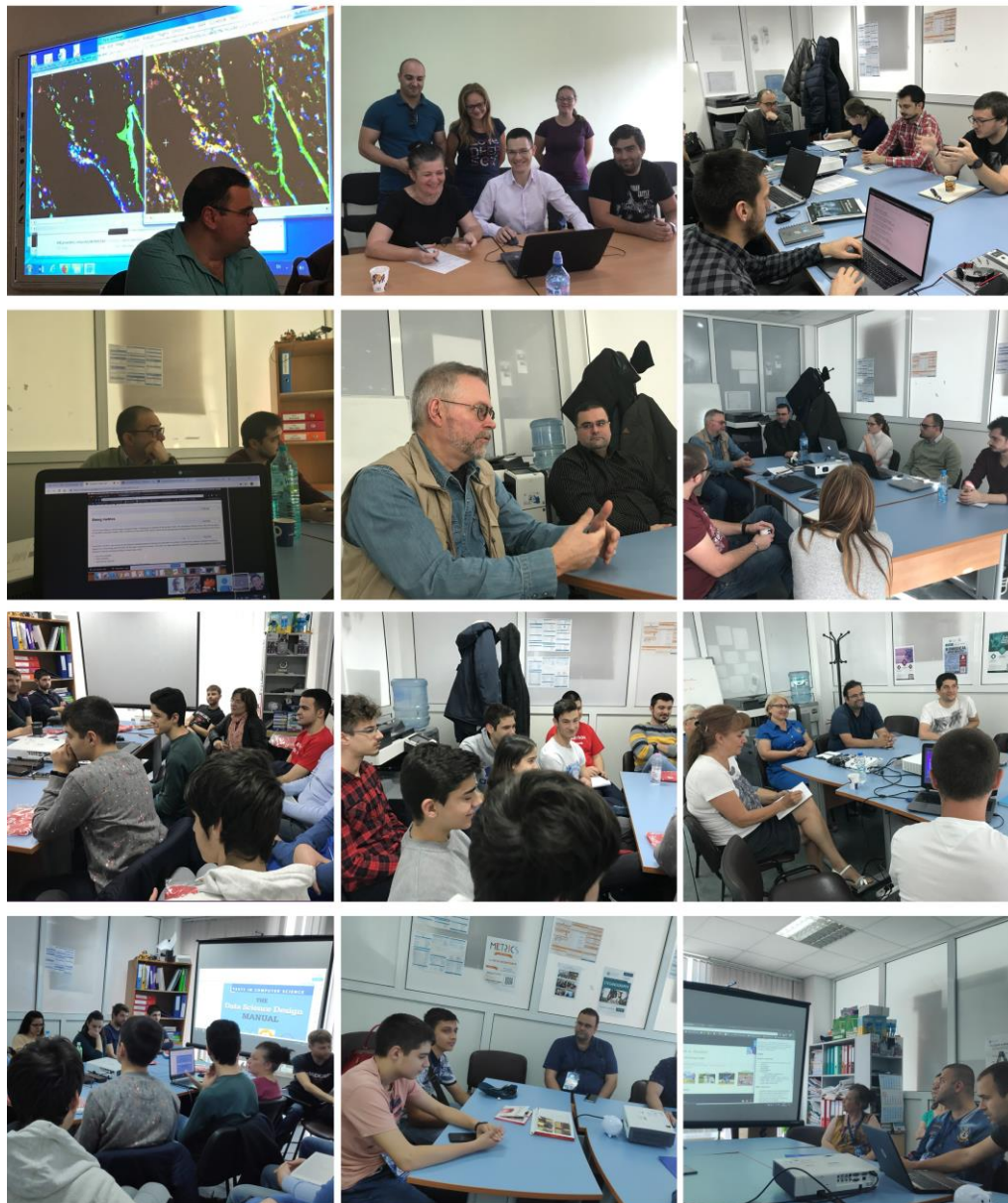
ЗА СЪЗДАВАНЕ И РАЗВИТИЕ НА НАУЧНОИЗСЛЕДОВАТЕЛСКА
МЕЖДУУНИВЕРСИТЕТСКА ЕКОСИСТЕМА ПО
АНАЛИЗ НА БИОМЕДИЦИНСКИ ИЗОБРАЖЕНИЯ

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2020

VFU Data Science WEBINARS



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THAT MATTER

IMAGE ANALYSIS

f2f
@VFU, TI Lab

16:00 BG TIME
AUGUST 24, 2019

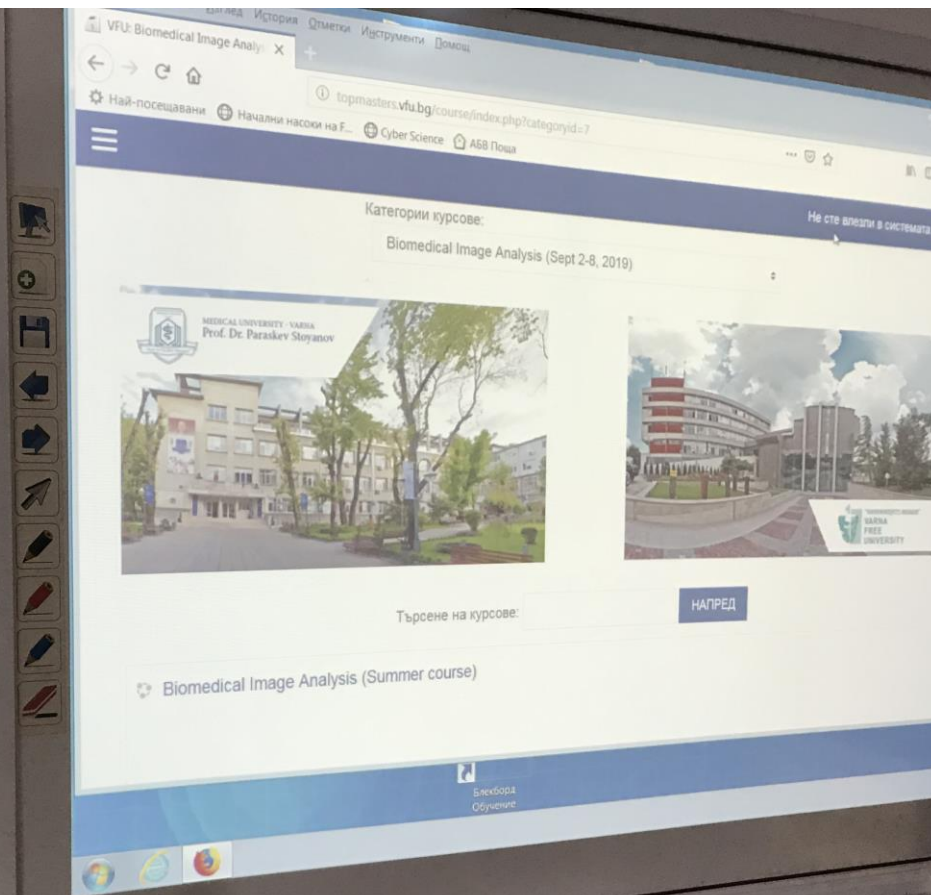
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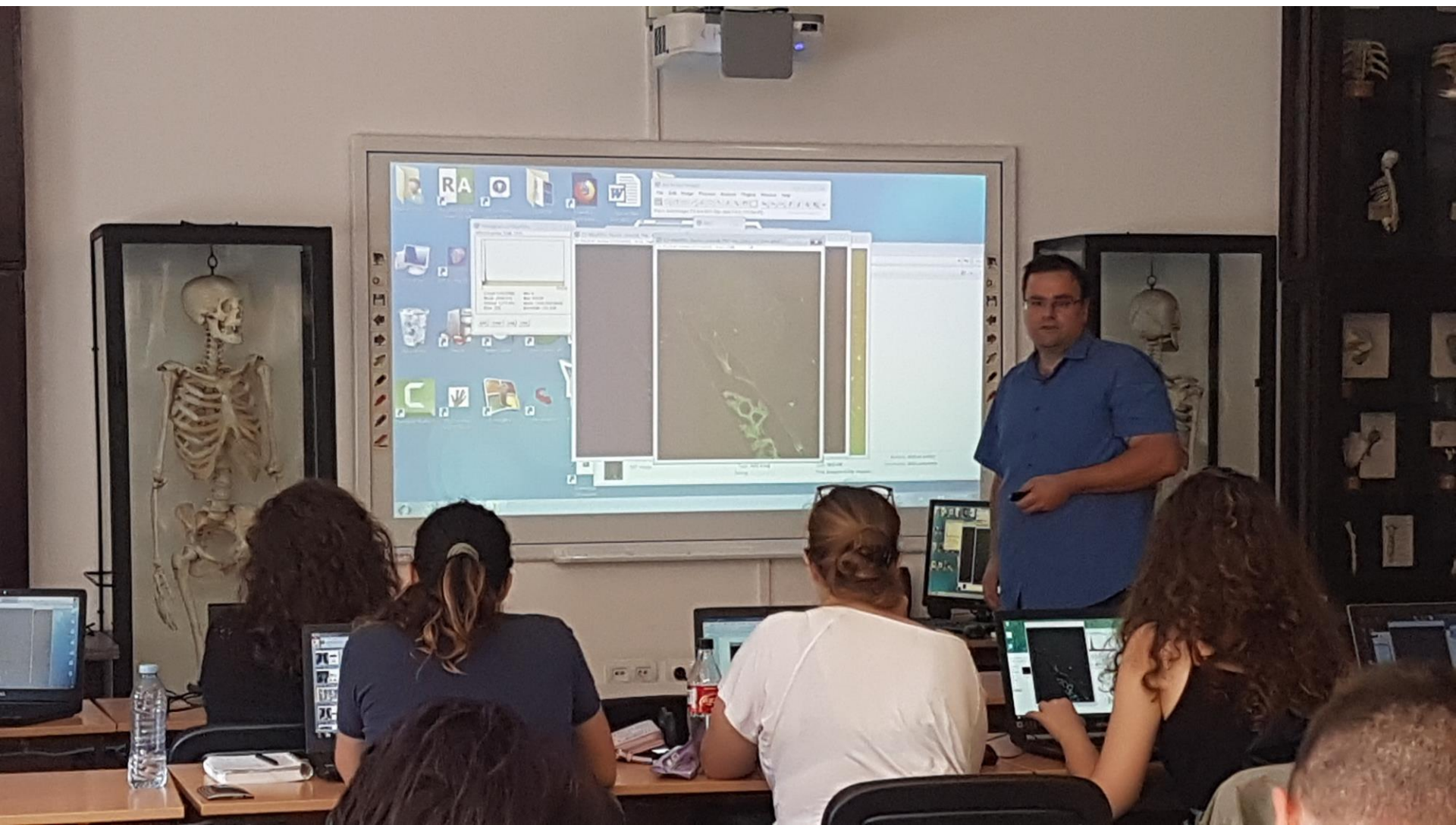












BIOMEDICAL IMAGE ANALYSIS

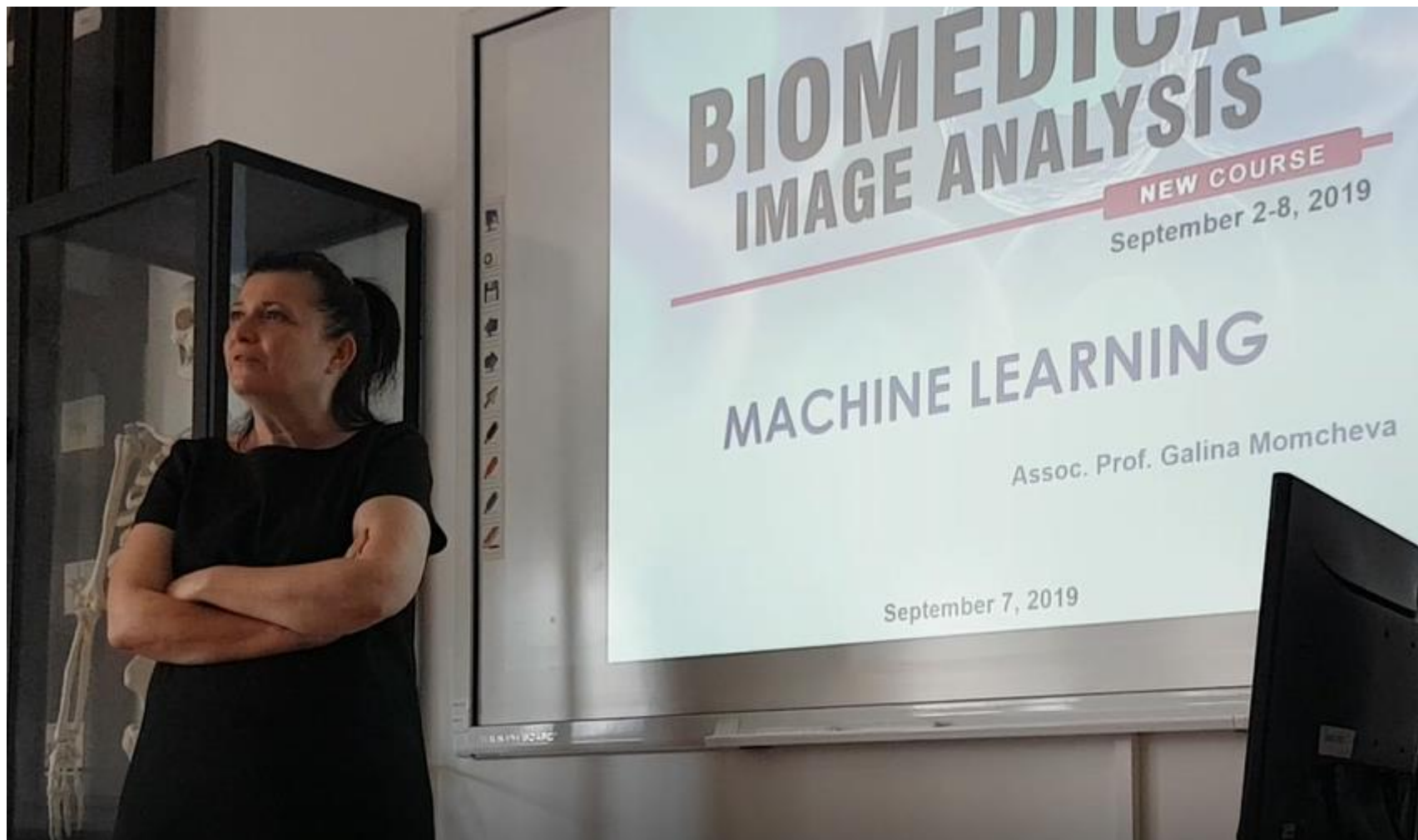
NEW COURSE

September 2-8, 2019

MACHINE LEARNING

Assoc. Prof. Galina Momcheva

September 7, 2019





BIOMEDICAL IMAGE ANALYSIS

02-08 SEPTEMBER

NEW COURSE 2019

PROGRAM

DAY 1 / SEPTEMBER 2

1. Digital Images

1.1. Introduction to Biomedical Image Analysis Course
Assoc. Prof. Galina Momcheva,
Assoc. Prof. Stoyan Pavlov

1.2. Fundamentals of Imaging
Assoc. Prof. Stoyan Pavlov

1.3. Pixel Level Manipulations
Assoc. Prof. Galina Momcheva

1.4. Practice Session 1
Assoc. Prof. Stoyan Pavlov

DAY 2 / SEPTEMBER 3

2. Image Representations and Manipulations

2.1. Histograms. Image Histograms
Assoc. Prof. Galina Momcheva

2.2. Image Representation and Manipulation
Assoc. Prof. Stoyan Pavlov

2.3. Practice Session 2
Assoc. Prof. Stoyan Pavlov

DAY 3 / SEPTEMBER 4

3. Image Filtering

3.1. Introduction to Filter Manipulations
Assoc. Prof. Galina Momcheva

3.2. Biomedical Image Filtering
Assoc. Prof. Stoyan Pavlov

3.3. Practice Session 3
Assoc. Prof. Stoyan Pavlov

DAY 4 / SEPTEMBER 5

4. Image Morphology

4.1. Morphology
Assoc. Prof. Galina Momcheva

4.2. Morphological Image Processing
Assoc. Prof. Stoyan Pavlov

4.3. Automation in Image Processing with Image
Assoc. Prof. Stoyan Pavlov

4.4. Practice Session 4
Assoc. Prof. Stoyan Pavlov

DAY 5 / SEPTEMBER 6

5. Segmentation. Classification. Clustering

5.1. Image Segmentation and Classification
Assoc. Prof. Galina Momcheva

5.2. Segmentations, Regions and Labels
Assoc. Prof. Stoyan Pavlov

5.3. Practice Session 5
Assoc. Prof. Stoyan Pavlov

DAY 6 / SEPTEMBER 7

6. AI. ML. Machine learning for Image Segmentation

6.1. BIOIMAGE ANALYSIS TOOLS (REVIEW)
Assoc. Prof. Galina Momcheva

6.2. Artificial Intelligence - Problems and Opportunities
Assoc. Prof. Galina Momcheva

6.3. MACHINE LEARNING
Assoc. Prof. Galina Momcheva

6.4. Workflow DEMO
Assoc. Prof. Stoyan Pavlov

6.5. Demonstrations
Data Science Students

DAY 7 / SEPTEMBER 8

7. Advanced topics. Discussions. Open Presentations

7.1. Participants' Presentations
Dimo Stoyanov; Marin Zhelezov; Dimitar Bukvinov; Angel Parushev
Hristina Stefanova; Kalina Stoyanova; Georgi Mihaylov; Jakob Adolf

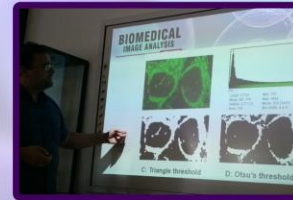
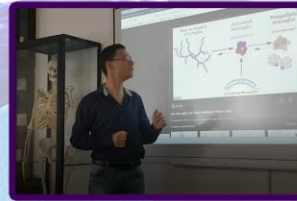
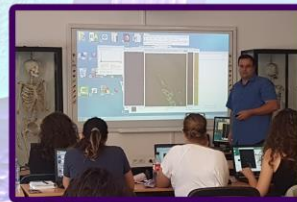
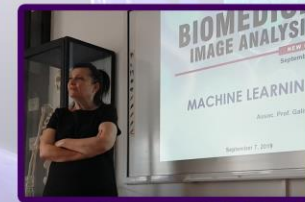
7.2. Synthetic Images
Alexander Dimitrov
7.3. Kristina Bliznakova Team Presentations
7.4. Community building session



BIOMEDICAL IMAGE ANALYSIS

NEW COURSE

IMAGES





НАУКАТА и ИЗКУСТВОТО на РАЗБИРАЕМ ЕЗИК

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НА ЗНАНИЕТО



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31 ОКТОМВРИ 2019 | 14:00 - 17:00 ч.

*Морско
Казифо*
Билборд

НОВИТЕ БУДИТЕЛИ : ВАРНА – ГРАД НА ЗНАНИЕТО

Съвместна експозиция по повод 1 ноември 2019 на Научноизследователския институт на Медицински университет – Варна и Варненския свободен университет

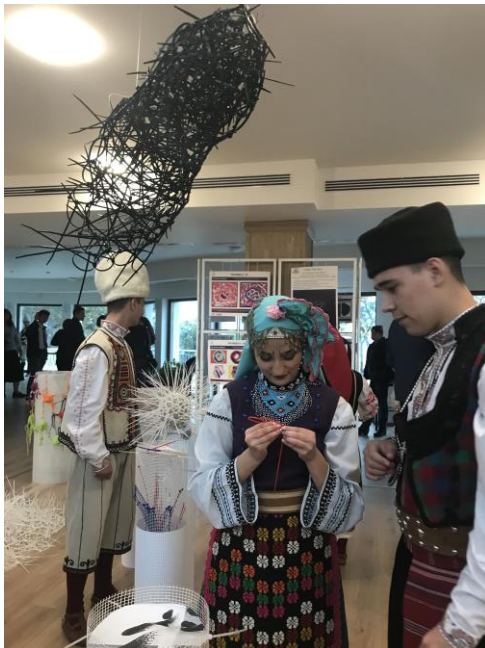


ВАРНЕНСКИ
СВОБОДЕН
УНИВЕРСИТЕТ
"ИСТОРИКОС, ХРАБЪР"



Експозицията гостува във Варненски свободен университет (до 23.11.19) и в Медицински университет - Варна (от 25.11.19)

May 18-27, 2020; SOFIA; National Assembly









jVarnaBioImage 2019 Team



MARK KIRICHEV

jVarnaBioImage 2019

Team Member
11th Grade

Interested in: Mathematics, Computer Science, Chemistry, Biology, Physics, Medicine

Research topic (in jBioMedVarna):

Segmentation of Subepicardial Adipose Tissue on CT Scan Images



TODOR SLAVOV

jVarnaBioImage 2019

Team Member
11th Grade

Interested in: Computer Science, Biology, Medicine, Bioinformatics, Ethics

Research topic (in jBioMedVarna):

Segmentation of Subepicardial Adipose Tissue on CT Scan Images



SIMEON ATANASOV

jVarnaBioImage 2019

Team Member
11th Grade

Interested in: IT, Computer Science, Medicine, Entrepreneurship

Research topic (in jBioMedVarna): Texture Analysis in Gene Expression ISH images

Scientific co-supervision of the team

- Assoc. Prof. Galina Momcheva, PhD
- Assoc. Prof. Stoyan Pavlov, PhD

Supervisors of the team

- Assoc. Prof. Galina Momcheva, PhD
- Assoc. Prof. Stoyan Pavlov, PhD
- Julia Dimitrova

jVarnaBioImage 2019 Team



YORDAN STOYCHEV

jVarnaBioImage 2019

Team Member
9th Grade

Interested in: Mathematics, Computer Science, Physics

Research topic (in jBioMedVarna):
Federated Machine Learning



NIKOLA NIKOLOV

jVarnaBioImage 2019

Team Member
9th Grade

Interested in: Computer Science, IT, Medicine, Entrepreneurship

Research topic (in jBioMedVarna): ImageJ plugin Development for DICOM Images



OGNYAN KANCHEV

jVarnaBioImage 2019

Team Member
9th Grade

Interested in: Mathematics, Computer Science

Research topic (in jBioMedVarna): ImageJ Plugin Development for DICOM Images

Scientific co-supervision of the team

- Assoc. Prof. Galina Momcheva, PhD
- Assoc. Prof. Stoyan Pavlov, PhD

Supervisors of the team

- Assoc. Prof. Galina Momcheva, PhD
- Assoc. Prof. Stoyan Pavlov, PhD
- Julia Dimitrova



CHANGE AGENTS



jVarnaBioImage 2019 Team

MENTORS

MEDICINE TEAM

Meet the Medicine team members of BioMed Varna.



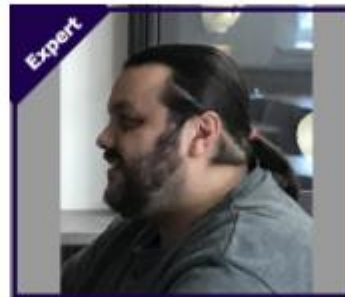
Dimo Stoyanov

PhD Student
Medicine
Medical University Varna



Martin Ivanov

PhD Student
Medicine
Medical University Varna



Petar Valchanov

PhD Student
Medicine
Medical University Varna



Yanka Baneva

PhD Student
Medical Physics
Medical University Varna

Scientific supervision of the team

Assoc. Prof. Stoyan Pavlov, PhD

jVarnaBioImage 2019 Team

MENTORS

DATA SCIENCE TEAM

Meet the Data Science team members of BioMed Varna.



Issa Kamar

PhD Student
Computer Science
Varna Free University



Mario Maroun

PhD Student
Computer Science
Varna Free University



Plamena Tsankova

PhD Candidate
M.Sc. Data Science
Varna Free University



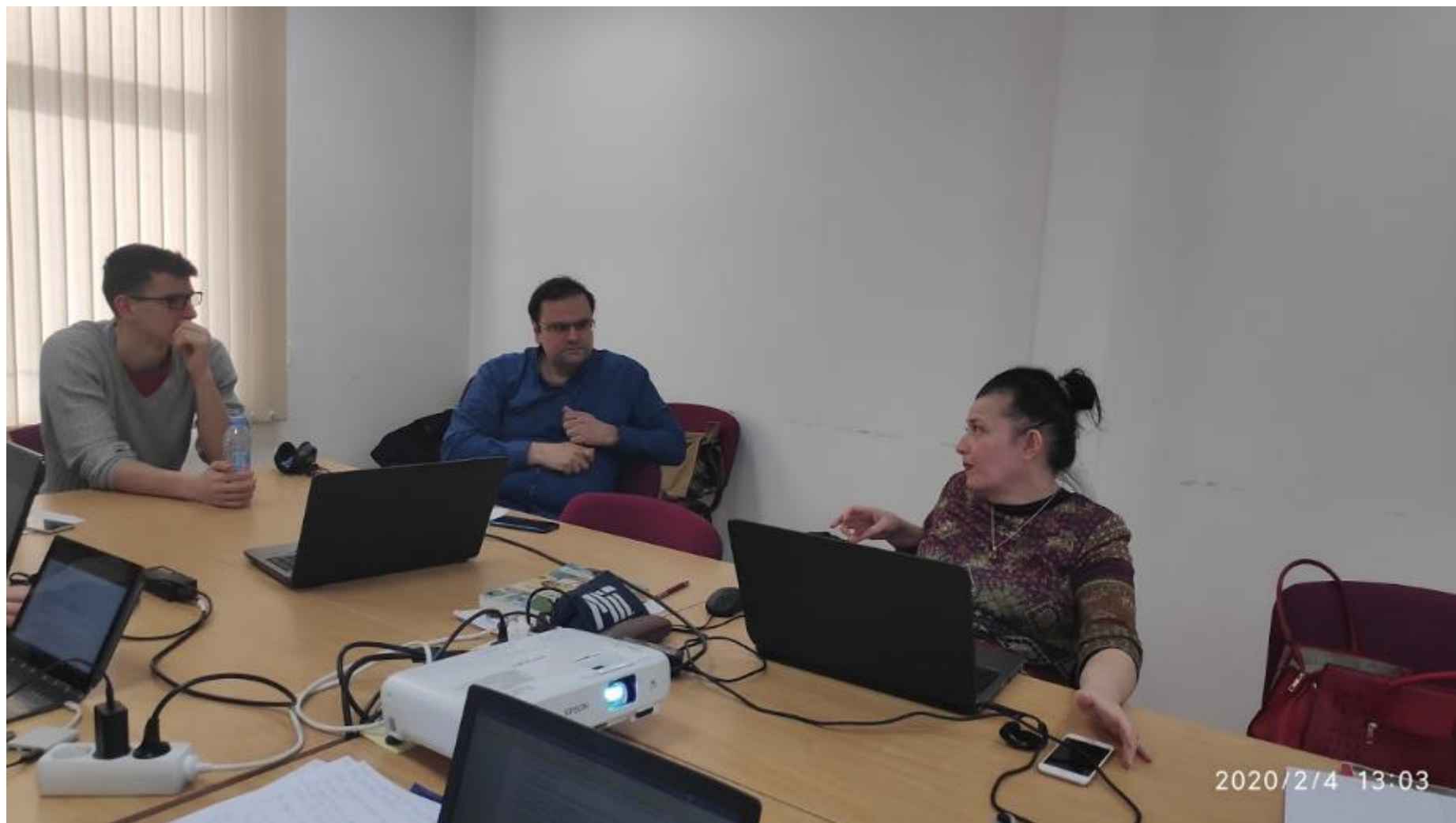
Hristo Hristov

PhD Candidate
M.Sc. Data Science
Varna Free University

Scientific supervision of the team

Assoc. Prof. Galina Momcheva, PhD



















normal number but abnormal distribution of GAD67+ cells in the cortex of *Urb1* mutants. Coronal brain sections from 2-week old heterozygous (A) or homozygous (B) animals were hybridized with a *Gad1*-specific riboprobe. In contrast to wild-type sections, in which GAD67+ cells are distributed mostly uniformly, in mutant sections GAD67+ cells are concentrated in the upper and deep cortical layers. The effect of the *Urb1* mutation on the distribution of GAD67+ cells along the ventricular zone (C) and the somatosensory (D) cortex. For this, equivalent areas of cortex from heterozygous and homozygous *Urb1* animals were analyzed. The proportion of GAD67+ cells present in each bin was determined. The white and gray bars represent the percentages of GAD67+ cells in the cortex of heterozygous and mutant animals, respectively. Error bars in C and D represent SDs (five animals and five sections per animal). *** correspond to p (t test) values of <0.05 , <0.01 , and <0.001 , respectively. Coronal sections through the midbrain of *Urb1* mutants hybridized with a *Gad1*-specific riboprobe. The number of GAD67+ cells is not reduced, but unlike to the wild-type, they are concentrated in the input layers of the CA1 region. DG, Dentate gyrus; ISH, in situ hybridization; pcd, pyramidal cell layer; str, striatum.

PDF

f1



M.Sc Data Science

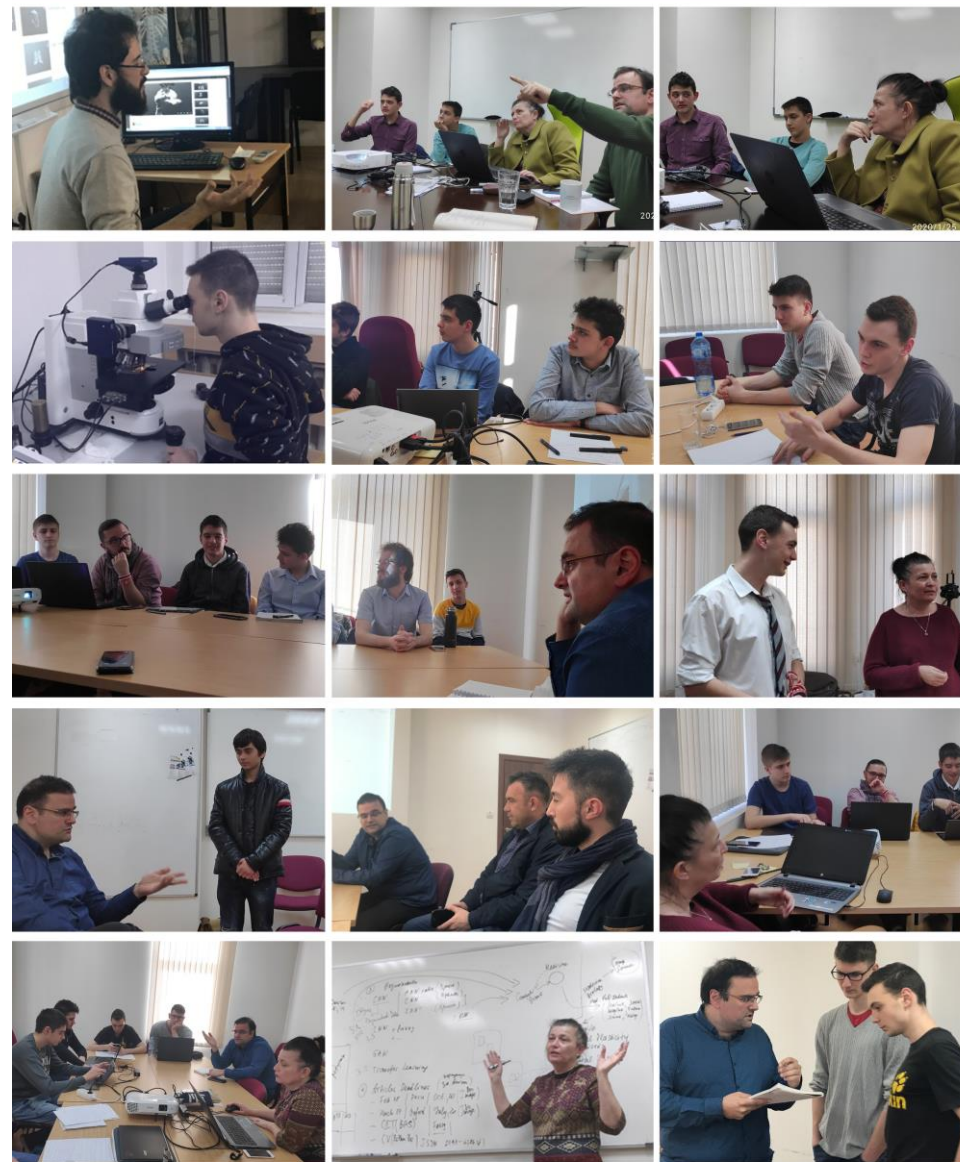


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Molecular Imaging
Metabolomics

Image - Data processing
& Ground truth

Ultrasound
Imaging and Therapy

Gliomas

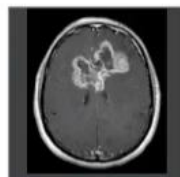
Gliomas are the most frequent primary brain tumors. These can be divided in two groups according with their aggressiveness.

Survival range

HGG → (1-2 years)

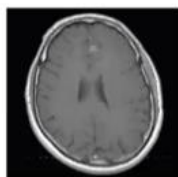
LGG → (1-15 years)

HGG



Glioblastoma
(butterfly)

LGG



Diffuse infiltrating
astrocytoma



Clovis Tauber

Моят диск > BIOMED VARNA 2020

Име ↑

_AI in NEUROSCIENCE - CEF-TC-2020-1

0. BioMed_General_Meetings

1. NUCLEI SEGMENTATION & LABELING

2. DATA AUGMENTATION

3. TEXTURE ANALYSIS

4. ANN

5. PLUGINS

6. BRAIN

7. DATA SETS

8. ETC

9. SURVEYS

Labeling and annotation strategies

Papers and conferences

GLCM experiments.ipynb

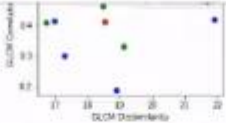
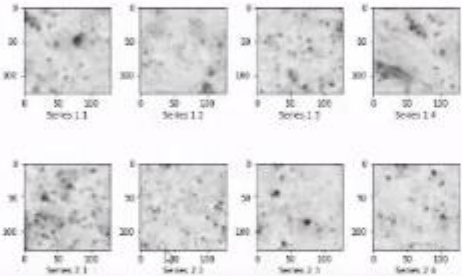
File Edit View Insert Runtime Tools Help Last saved at 9:30:25

Table of contents

- deprecates exporting raw numpy array as a grayscale skimage-compatible numpy array
- Generating a GLCM of the whole image, as well as of certain fragments from it**
 - Comparison between three different blocks of 512x512
 - Analysis of similar features from different locations, 512x512
 - Analysis of similar features from different locations, 256x256
 - Conclusion
- Section

Code Text

Connect Editing

• Comparison between three different blocks of 512x512

As seen from the data above, the variables generated from the GLCMs of the segments vary widely. For this reason in the following program I will calculate GLCMs of three different blocks of 512x512 from the original image

```

1 } import matplotlib.pyplot as plt

from skimage.feature import greycomatrix, greycoprops
from skimage import data

import numpy as np
from skimage.util import img_as_ubyte
import cv2
  
```



jupyter LGP histograms (autosaved)

File Edit View Insert Cell Kernel Widgets Help

Trust Python 3

```
plt.show()
```



0.05 0.25 0.45 0.65 0.85 1.05

Histogram of oriented Ingridient

HOG is a **feature** descriptor that counts occurrences of gradient orientation in localized portions of an image - detection window, or re

11:02 (11:00)

11:02 AM

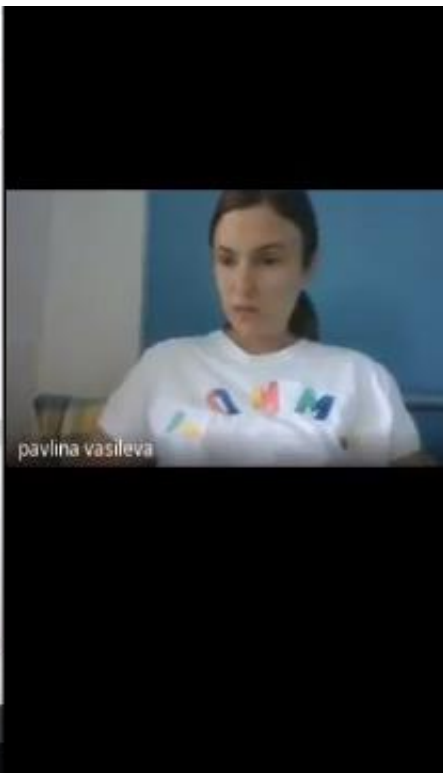
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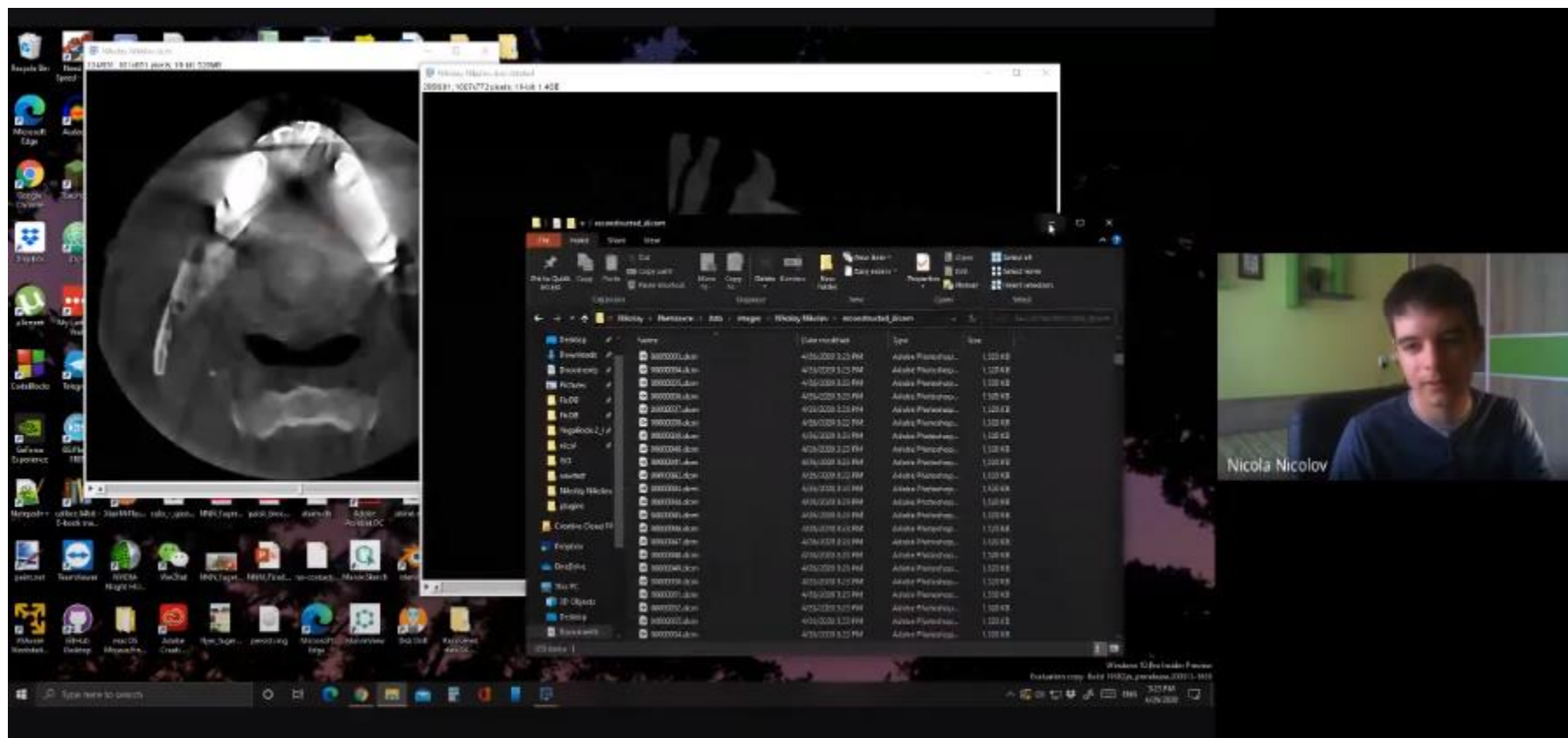
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14:07 30/04/2019







Simeon Atanasov представя

Activities Fiji-Main

24 Jul 13:05

en 100%

Mkyschdown30x-ASIT.tif (50%)

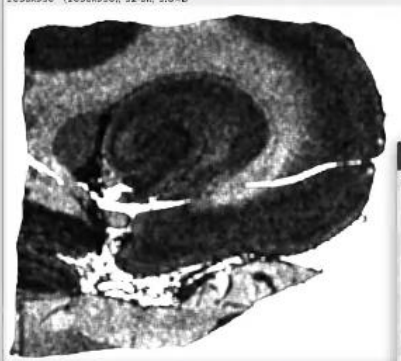
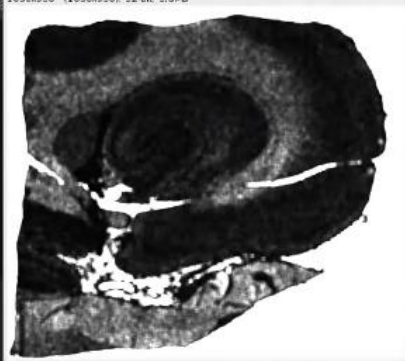
Mkyschdown30x-energy.tif (50%)

Mkyschdown30x-entropy.tif (50%)

1050x950 (1050x950); 32 bit; 3.8 MB

1050x950 (1050x950); 32 bit; 3.8 MB

1050x950 (1050x950); 32 bit; 3.8 MB

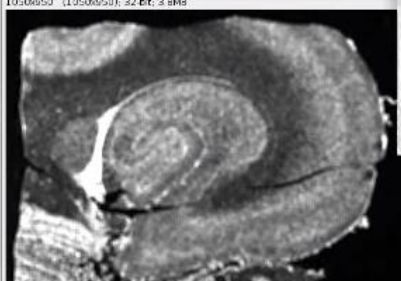


Mkyschdown30x-contrast.tif (50%)

Mkyschdown30x-dissimilarity.tif (50%)

1050x950 (1050x950); 32 bit; 3.8 MB

1050x950 (1050x950); 32 bit; 3.8 MB



Automated ML, NN Models ...

Хора (4)

Чат

Добавяне на хора



доц. д-р Галина Момчева (ви...



Стоян Павлов



Simeon Atanasov (презентац...



Simeon Atanasov

13:09

24.7.2020 г.



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ПРОФ. Д-Р ВАЛЕНТИН ИГНАТОВ**

**ДО
РЕКТОРА НА
ВСУ „ЧЕРНОРИЗЕЦ ХРАБЪР“
ПРОФ. Д-Р ПЕТЪР ХРИСТОВ**

**УВАЖАЕМИ ПРОФ. ИГНАТОВ,
УВАЖАЕМИ ПРОФ. ХРИСТОВ,**

Позволете ми да изразя своето възхищение от работата на BioMed Varna - Научноизследователска екосистема, ръководена от доц. Стоян Павлов (МУ-Варна) и доц. Галина Момчева (ВСУ). BioMed Varna бе изградена и за впечатляващо кратко време.

След тяхна покана и мое участие в уебинар на 26.04.2020 г. изразявам категоричен интерес да се мултиплицира ефекта от BioMed Varna, като това може да стане чрез създаване на аналогична екосистема и в областта на Биоинформатиката. Тя ще бъде фокусирана върху развитието на нови софтуерни решения, свързани с биотехнологиите, геномното инженерство, медицинската диагностика и др.



SIGs

» Nuclei Segmentation Pipeline

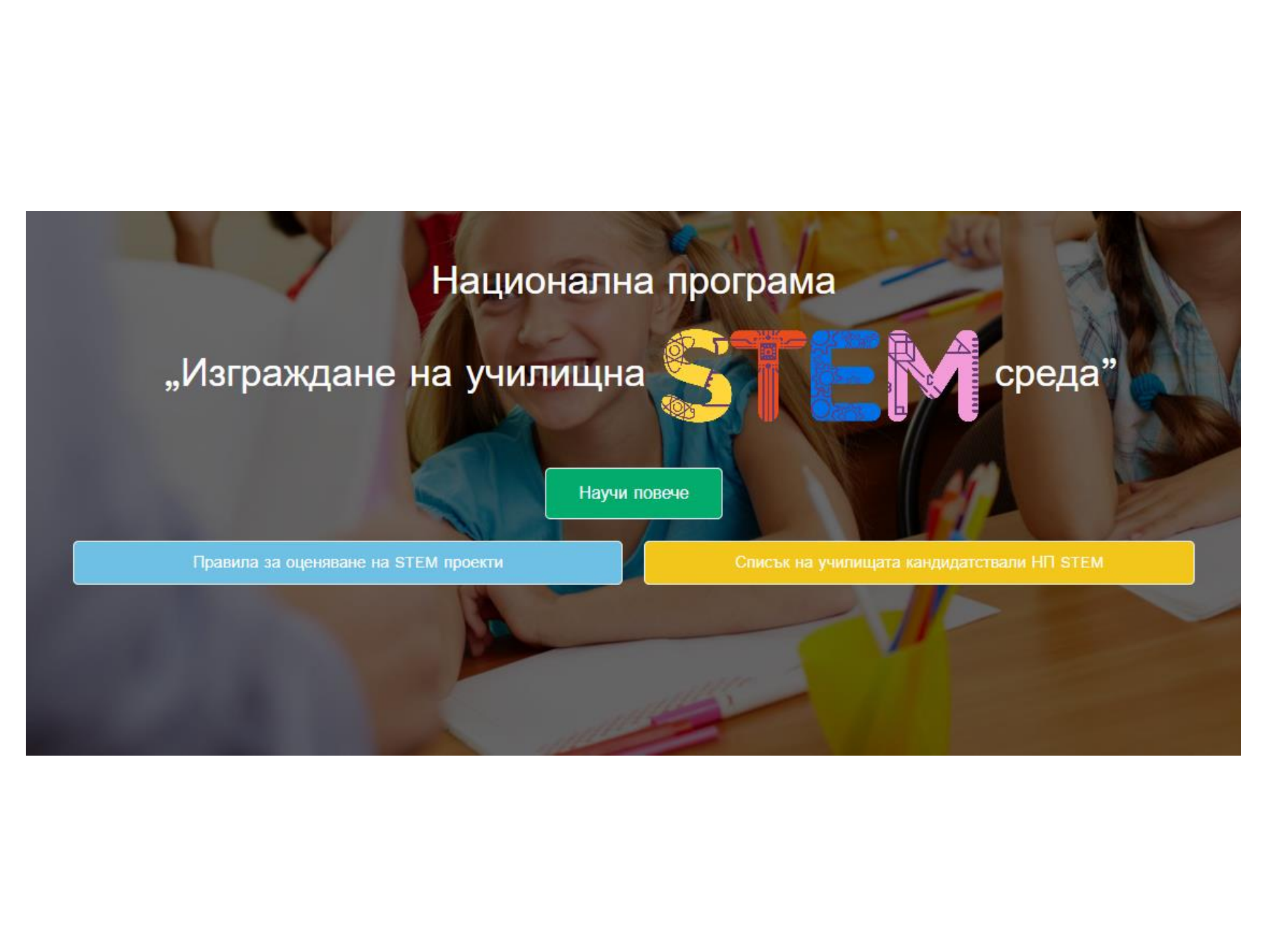
» Data Augmentation

» Artificial Neural Networks

» Texture Analysis

» Plugins Dev

» **BioInformatics**



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BioMed VARNA

www.biomedvarna.com

varnabioimage@gmail.com

