

Dissemination meeting

Miljan Cvetković

Vitalisnig ICT relevance in Agriculture Learning



VIRAL

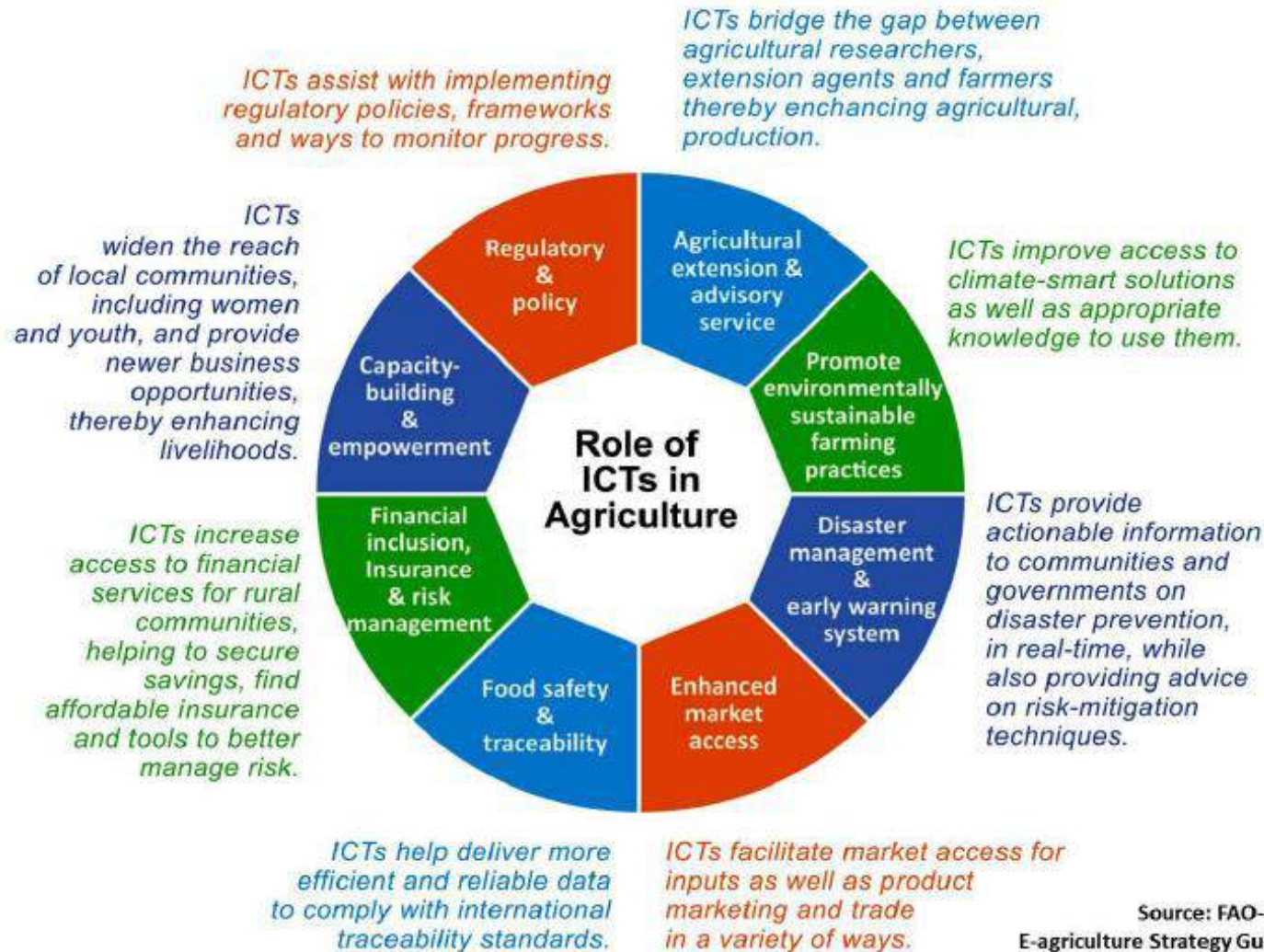
Bijeljina, 25.09.2020.

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Co-funded by the
Erasmus+ Programme
of the European Union



Figure 1: Role of ICT in agriculture



PROJECT AIM

Overall project aim of VIRAL to support university and business collaboration (UBC) through accelerating the use of ICT across Western Balkans agro-communities. The concept is led by relevant regional AET facilities and based on enabling the use of different ICT solutions/techniques/tools in the classroom and outside of it in order to obtain desired integration of agriculture and it engineering which in effect reinforces UBC across regional agro communities.



ICT for
Agriculture

SOI: to increase the capacity of HEIs to apply and generate ICT in AET and practice

- ☞ Highly educated and skilled agriculture labour force is mandatory to **create, share and use knowledge** and so is the case with a vibrant system of **teaching, research and innovation** to be able to tap into global knowledge, assimilate and adapt it to the local need.
- ☞ Universities responsibility could be better served when **HEIs are current in terms of modern ICT infrastructure and tools.**
- ☞ Thus, VIRAL offers a robust **training component for teaching staff, students, non-formal educator and extension services providers** whereby ICT solutions/techniques/tool are debated and use explained.
- ☞ Comprehensive set of training looks into importance/general use of ICT in agriculture, **robotic management, software applications, drones and GIS.**



SO2: to improve effectiveness and employability of AET graduates

Focusing on employability helps universities **to attract and retain high quality students** and maintain a competitive advantage, while for students employment outcomes form key motivation for pursuing certain education fields. With this in mind VIRAL puts emphasis on:

- ☞ **bridging the existing skills gap**: It is important to engage with businesses to facilitate closer correspondence between the skills universities teach and the skills businesses want in the agriculture field.
- ☞ **integrating employability into curricula**: in seeking ways to integrate employability-focused moments into curricula VIRAL uses employer relationships as a means of providing meaningful problem-based learning experiences. These are evidenced by organization of hackathons pitching competitions as capacity building tool for HEIs and output for use in industry. New knowledge is also generated through active involvement of students with prospective business operators networking at the hackathons.



SO 3: to boost academic-business cooperation regional platform for sustainability, networking and exchange within agricultural and technological communities

Stemming from successful implementation of the SO 1 and 2 which provide a structured capacity building frame, SO 3 represents a **peak of efforts that build standing formal networking and alliance among ICT and agricultural SMEs with HEIs** in the form of a spin off *EXPO* event and by:

- ☞ **providing IT services** appropriate to the needs of regional agro-communities including both AET and producers, increasing their efficiency & sustainability,
- ☞ **ever-expanding knowledge base** constructed around a user-friendly knowledge co-creation and transfer in the field that goes both ways from university to business and vice versa,
- ☞ **competitive and available agricultural integrated IT solutions** for agricultural business operators, **increasing efficiency and profit-making ability of the sector.**



Work packages



Work package I - Preparation

Work package type and ref.nr	PREPARATION	WP.1
TITLE	PREPARATION	

Tasks

- 1.1 To carry out comparative analysis of university-business cooperation in agriculture in the Western Balkans and EU and develop policy recommendations
- 1.2 To carry out needs analyses and map knowledge transfer potential
- 1.3 To create web portal
- 1.4 To organize Introduction conference

<http://viralerasmus.org/en/news/>



Presentation of the project VIRAL at Džemal Bijedić University

On the 42nd anniversary of founding Džemal Bijedić University in Mostar on February 16, 2020, presentation of...



Lecture „Agriculture and ICT“

With in the project VIRAL, funded by ERASMUS+ through the Edgewise programme, a lecture „Agriculture and ICT“ was held at...



Partners of project VIRAL together on a new project

Thanks to the consortium of the VIRAL project „VITAL (VNC ICT RELEVANCE IN AGRICULTURAL URBAN ICT)“ funded by the...



Usage of ICT in teaching

Activities on work package one (WP1) of project VIRAL, are ongoing, and as part of these activities surveys for students are...



VIRAL Project Implementation Commences

In the latter half of 2019, out of 600 projects submitted within the Edgewise programme, the...



Dissemination meeting in Bijeljina

In order to accomplish employees at the University of Bijeljina with the goals and initial results of the VIRAL Erasmus+ project on...



VIRAL project to meet the symposium of agronomists

The VIRAL Erasmus+ project will be presented to the wider academic audience during the 16th International Scientific...



Monitoring visit by National Erasmus+ Office in BiH

On Friday, September 11, 2020, in the premises of Faculty of Agriculture, University of Bihać, monitoring visit by National...



Introductory workshop on the use of ICT in agriculture

Agriculture teaching staff has a great need and is willing to learn, nowadays about application of ICT technologies in agriculture. The...



ICT connects producers with customers - platform "Countryside products"

At the invitation of the Ministry of Agriculture, Forestry and Water Management of the Republic of...



VIRAL: Project partners turned their experience into a guide on organizing hackathons

Technology is improving rapidly finding its application in almost all areas of life. The...

ICT in Agriculture - Viral

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[ABOUT US](#)
[CONTACT](#)

ICT IN AGRICULTURE





Introduction conference
Srdja Radonic







Introduction conference
Mirza Jelic







Introduction conference
Jasna Ruzic



ICT in Agriculture - Viral

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Introduction conference
Rozvija Pleskovic







Introduction conference
Gada Cepner







Introduction conference
Jugoslavica



Visualizing ICT Relevance in Agricultural Learning

23/01/2020 | 11:58 - 12:33 | Izvor: SRNA

Twitter Share

Za napredak značajno uvođenje informacionih tehnologija

Uvođenje informaciono-komunikacionih tehnologija u poljoprivredu neophodno je radi smanjenja troškova, a u Republici Srpskoj bi u ovoj godini trebalo da bude nabavljen softver za satelitsku analizu u ovoj oblasti, rečeno je danas u Banjaluci na konferenciji o informacionim tehnologijama u agraru.



ДНЕВНИК 1
12:13

БАЊА ЛУКА

Viši stručni saradnik u Ministarstvu poljoprivrede, šumarstva i vodoprivrede Republike Srpske Mirko Jokić istakao je da su informacione tehnologije sve više zastupljene u poljoprivrednoj proizvodnji i da će nabavkom softvera biti identifikovane poljoprivrede kulture u Srpskoj što je značajno za utvrđivanje agrarnih politika i podsticajnih mjera, kao i zdravstvenog stanja usjeva.



KONFERENCIJA O PRIMENI IKT U POLJOPRIVREDI TEHNOLOGIJE SU VITALNE ZA SMANJENJE TROŠKOVA

Primena novih tehnologija u poljoprivredi važna je, pre svega, zbog smanjenja troškova, ali i povećanje konkurentnosti poljoprivredne proizvodnje, ističu stručnjaci u ovoj oblasti.



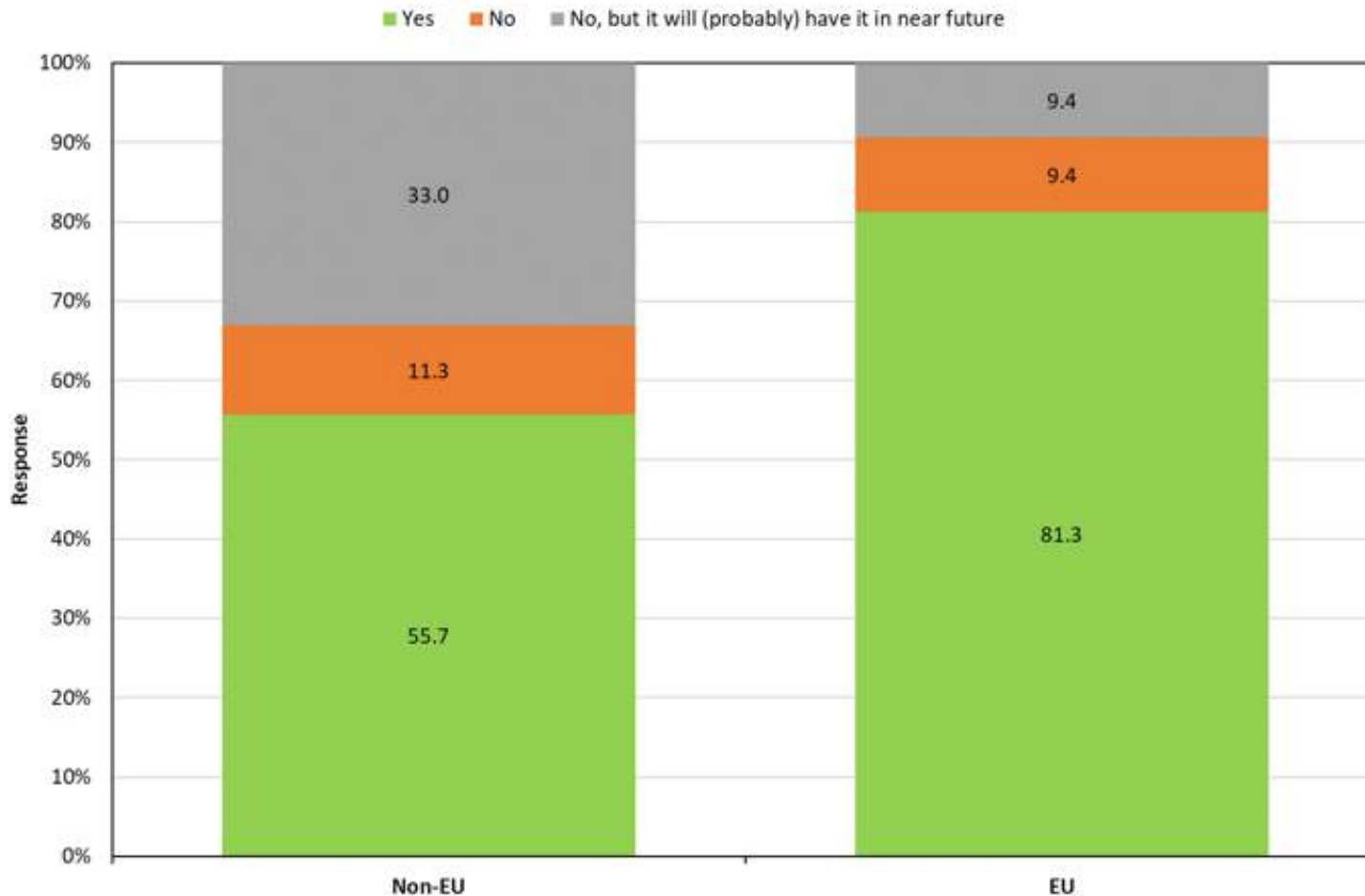
Projekat „Viral“ je dio Erasmus plus programa, a namenjen je jačanju kapaciteta u visokom obrazovanju za

polje i šumarstva, a dio je međunarodnog Erasmus plus projekta „Viral“.

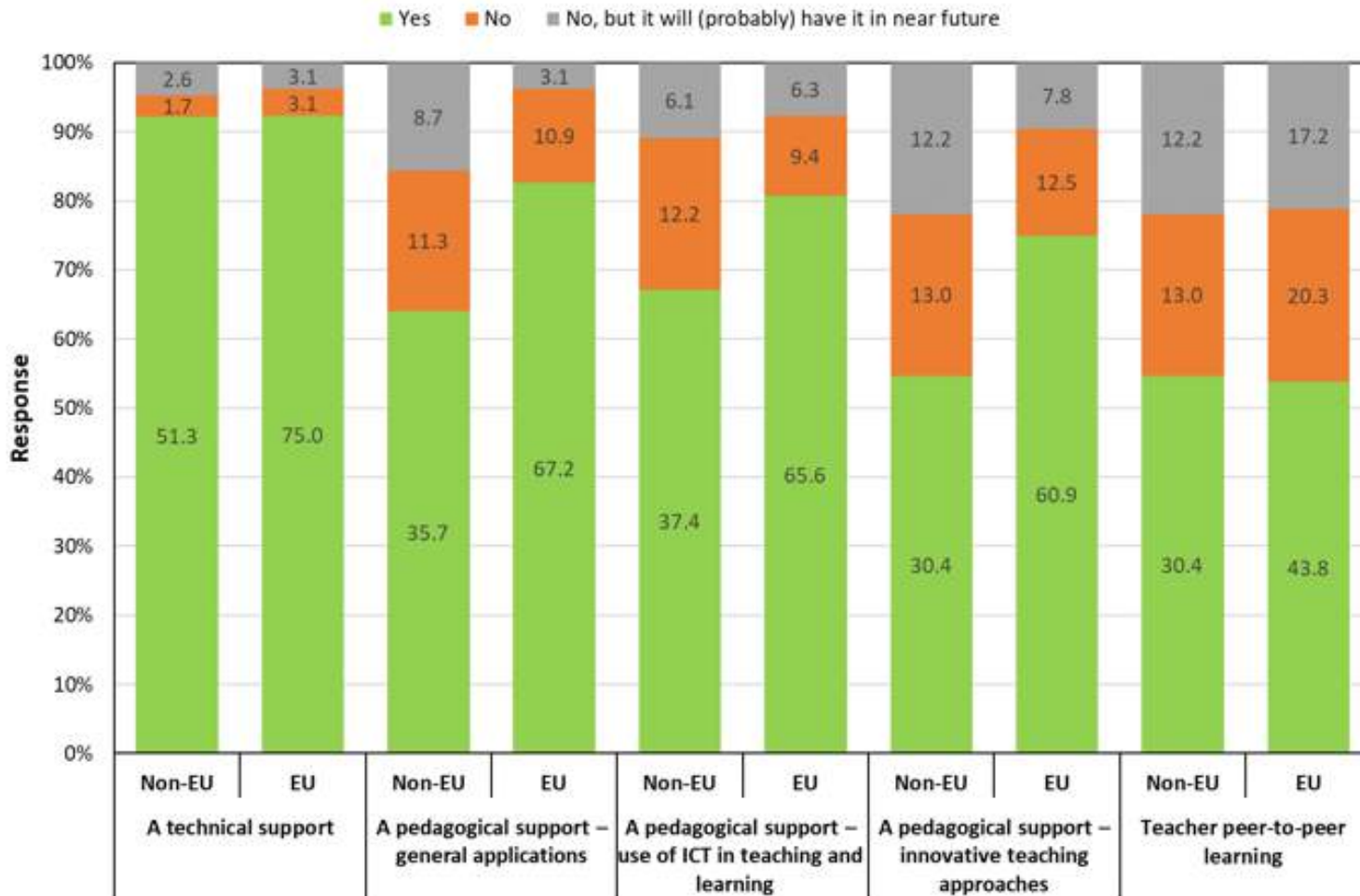
Konferencija je okupila oko 50 vodećih međunarodnih istraživača, koji su govorili o najnovijim saznanjima u primeni IKT u poljoprivredi i šumarstvu, a posebno kada je u pitanju IKT u svim oblastima. Kolege iz Maribora predstavljaju tri rešenja koja primenjuju u agraru, kao i podsticajne mjere.

Part 1 (institution's ICT strategy, availability and use of ICT in teaching)

Q1: Please indicate whether your institution (University/Faculty) include ICT use in its vision and supported it by specific policies and strategies.



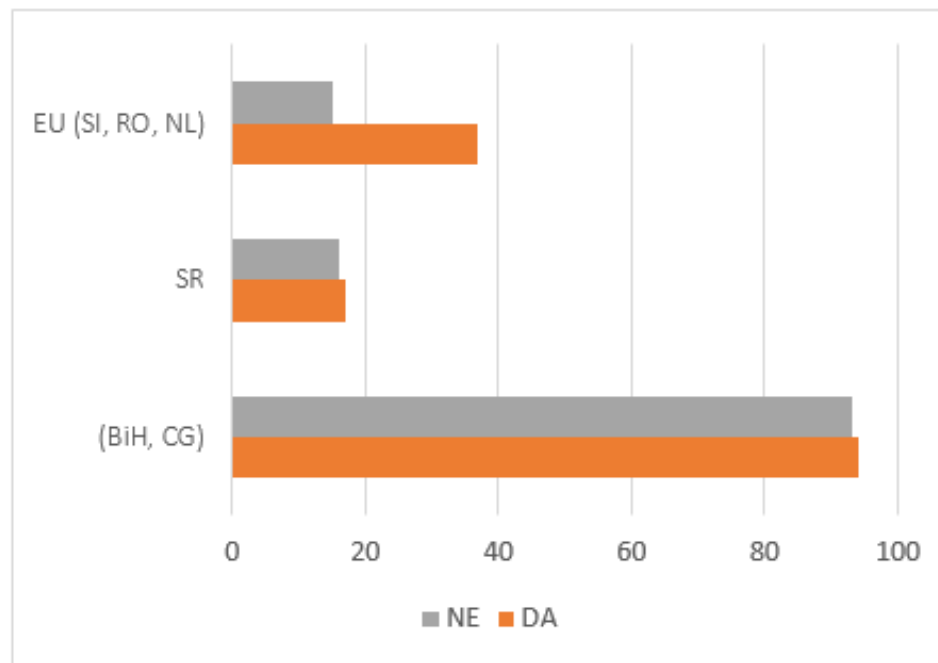
Q2 (Q1a): What types of support are available at your institution (University/Faculty)?



We obtained interesting data by analyzing the responses of agricultural producers. By comparing data on the use of information technology in agricultural production itself, we obtained data that show that there is a big difference between EU countries on the one hand and BiH, Montenegro and Serbia on the other. In BiH, Montenegro and Serbia, this ratio is almost equal, while, as expected, ICT is used much more in all three EU countries.

Grafikon 2.: Da li koristite IT na vašoj farmi?

Graph 2.: Do you use ICT on your farm?



Work package II - Building competences in AET

Bedir Tekinerdogan	Architecting IoT Based Farm Management Information Systems
Cagatay Catal	Machine Learning/Deep Learning in Agriculture
Qingzhi Liu	IoT in Agriculture
Ayalew Kassahun	Business-IT Alignment in Agri-Food Supply Chains
João Valente	Drones in Agriculture



Architecture Design of FMIS

Bedir Tekinerdogan

ARTIFICIAL INTELLIGENCE
The Future of Everything

1. Sensors
2. Computer Vision
3. Natural Language Processing
4. Machine Learning
5. Planning, Scheduling, Search, Recommendation
6. Multi-Agent systems
7. Knowledge Representation and Reasoning
8. Personalized Advice

AI

Cagatay Catal

Network Architecture of IoT

Qingzhi Liu

Stal van de Toekomst

Ayalew Kassahun

Research - Shaping the past, harnessing science, and looking forward

João Valente

Work package II - Building competences in AET



The first workshop on ICT in Agriculture IoT and GIS in Agriculture

Agriculture teaching staff has a great need and is willing to learn novelties about application of ICT technologies in agriculture. This is also one of the most important goals of the Erasmus + VIRAL project. The First workshop on ICT in agriculture in a series of trainings within the VIRAL project will be organized on September 29-30, 2020, in Tuzla. The lecturers are professors and researchers from the University of Tuzla, University of Maribor, University of Sarajevo and University of Banja Luka. The activity is implemented within the work package 2 (WP 2.1) whose coordinators are the Wageningen University & Research and the University of Donja Gorica. We invite you to take part in this event.

AGENDA

University of Tuzla, Faculty of Electrical Engineering

September 29th, 2020

TIME	TOPIC	SPEAKERS
10:30-11:00	Registration	
11:00-11:15	Welcome speech	Rector of the University in Tuzla Dean of the Faculty of Electrical Engineering
11:15-11:30	Project implementation status	MILAN CVETKONIC
11:30-12:00	Evolution Intelligence and Trends in Geographic Information Systems: Two Cases from Bosnia and Herzegovina	ALMER KARADZOVIC, PROFESSOR  University in Sarajevo, Faculty of Electrical Engineering GALIS Center for Geospatial Research-Sarajevo https://www.unsa.ba/en/department/electrical-engineering



12:00-12:30 Application of GIS in Agriculture
MILAN CVETKONIC

University of Banja Luka
Faculty of Agriculture
http://dial.unibl.org/eprints/graduat/vetkovic_milan

12:30-13:00 Applications of Digital Signal Processing in Agriculture
ZORANKA BARIĆ, PROFESSOR

University in Banja Luka
Faculty of Electrical Engineering
https://www.unibl.org/eprints/graduat/baric_zoranka

13:00-13:05 Discussion

13:15-14:30 Lunch break

14:30-15:00 Smart Farming: A Case of Automatic Cows Milking System
ANDRIJ CERIC, ASSOCIATE PROFESSOR

University in Tuzla
Faculty of Electrical Engineering
<http://www.uniz.edu.ba/konferencije/2020/09/29-30/20200929-30>



15:00-15:30 Incorporating smart IoT agriculture systems into engineering curriculum
ALMER KARADZOVIC, ASSOCIATE PROFESSOR

University in Tuzla
Faculty of Electrical Engineering
<http://www.uniz.edu.ba/konferencije/2020/09/29-30/20200929-30>

15:30-16:00 Remote Monitoring and Control System for Greenhouse Based on IoT
DINA DRAGIĆ, ASSOCIATE PROFESSOR

University of Novi Sad
Department of Electronic Engineering
<http://www.uniz.edu.ba/konferencije/2020/09/29-30/20200929-30>

16:00-16:30 Summary/Questions

16:30-18:00 Conference meeting

19:00-22:00 Social dinner

Work package II - Building competences in AET

Ministry for Science and Technological Development
Higher Education and Information Society

Универзитет у Београју
Универзитет у Београју
Универзитет у Београју

Ministry of Agriculture and Rural Development
University of Novi Sad
Faculty of Agriculture and Forestry
University of Novi Sad

NC STATE UNIVERSITY
College of Agriculture and Life Sciences
Department of Horticulture
University of North Carolina

NC STATE UNIVERSITY
College of Agriculture and Life Sciences
Department of Horticulture
University of North Carolina

1. Object and
2. Justification and
3. Importance of the
4. Expected results
5. Expected impact
6. Expected benefits
7. Expected costs
8. Expected risks
9. Expected sustainability
10. Expected dissemination
11. Expected visibility
12. Expected communication
13. Expected impact
14. Expected benefits
15. Expected costs
16. Expected risks
17. Expected sustainability
18. Expected dissemination
19. Expected visibility
20. Expected communication

NEWS ICT IN AGRICULTURE DOWNLOADS CONTACT

Najnovije
VIRAL
2014 projects to meet the...
Monitoring visit by National...
translatory workshop on the...
ICT connects producers with...
partners "County side..."

Partners of project VIRAL together on a new project

Thanks to the consortium of the VIRAL project (VITALISING ICT RELEVANCE IN AGRICULTURAL LEARNING), funded by the European Union through the Erasmus+ program, the Faculty of Agriculture of the University of Banja Luka is lead partner of one of the 5 projects funded under the pilot program of Ministry for Science and Technological Development, Higher Education and Information Society of Republika Srpska, "Synergy". Through the tender proposal it is selected 5 projects that will co-finance joint projects of the scientific research community and the economy, which is a completely new approach to financing the projects of the line ministry.

WAGENINGEN
UNIVERSITY & RESEARCH

UDG

SCIENTIFIC COOPERATION PROJECTS FOR THE YEAR 2014

UNIVERSITY OF BANJA LUKA

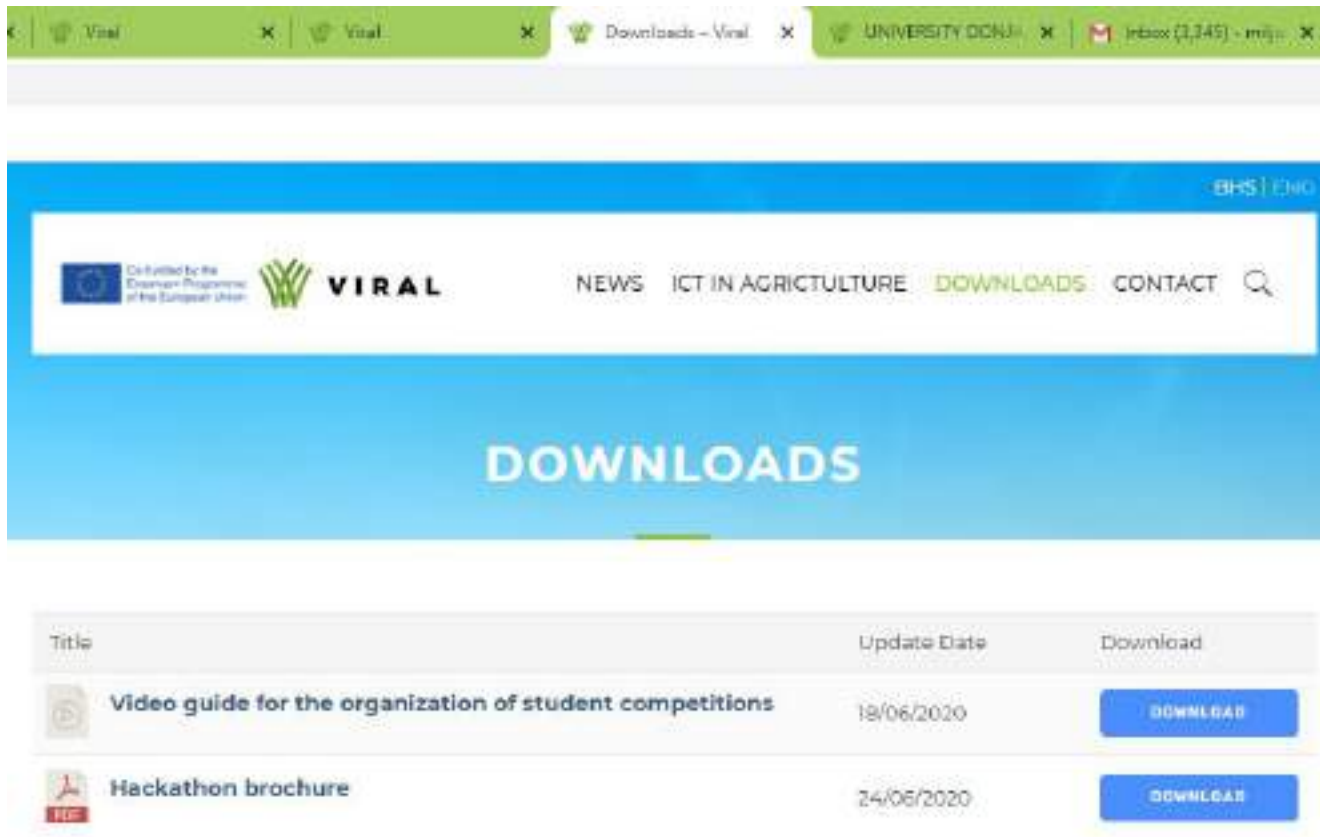
UNIVERSITY OF BANJA LUKA

UNIVERSITY OF BANJA LUKA

№	Project Name	Project Description
1.	Development of... University of Banja Luka	Development of... University of Banja Luka
2.	Development of... University of Banja Luka	Development of... University of Banja Luka
3.	Development of... University of Banja Luka	Development of... University of Banja Luka
4.	Development of... University of Banja Luka	Development of... University of Banja Luka
5.	Development of... University of Banja Luka	Development of... University of Banja Luka

UNIVERSITY OF BANJA LUKA

Work package III - Development of student pitching competition - hackatons





Delivered by the Erasmus Programme of the European Union

VIRAL

NEWS ICT IN AGRICULTURE **DOWNLOADS** CONTACT

DOWNLOADS

Title	Update Date	Download
 Video guide for the organization of student competitions	18/06/2020	DOWNLOAD
 Hackathon brochure	24/06/2020	DOWNLOAD



Work package III - Development of student pitching competition - hackatons

<https://www.youtube.com/watch?v=FD10E2csWtQ>



INTERA
technology park

Tehnopolis
Inovacioni Produktivni Centar

ICBL
Innovation
Centre
Banja Luka

mant

Work package III - Development of student pitching competition - hackatons



www.interaerasmus.org
viral@erasmus.unifrl.org



We are witnessing the almost daily progress of technology and a clear increase in the need to follow this trend in all aspects of life. The educational system is no exception, and there are increasing examples of common educational models complemented and enriched with extracurricular activities supported by both the academic community and the real sector and society in general. Student organizations that provide students with hands-on experiences but also allow them to acquire various business skills such as teamwork, leadership, business presentation and communication and many others, are a very popular tool for achieving this goal.

One of the most commonly organized student competitions is certainly a hackathon. The word "hackathon" is a derivative of two words - "hack" and "marathon". The word "hack" in this case does not refer to a breach of computer security, but it is used in the sense of exploratory programming, which is modifying a computer program and creating problem-solving that has been in the lines. The word "marathon" clearly defines the duration of the event. In simple words, a hackathon is a special event of predefined duration, at which participants connect to solve a defined problem together.



Work package IV - Creation of university-business cooperation platform

Work package type and ref.nr	DEVELOPMENT		WP.4
TITLE	CREATION OF UNIVERSITY-BUSINESS COOPERATION PLATFORM		
Tasks	<p>4.1 To organize introduction seminar on university-business cooperation</p> <p>4.2 To organize development workshops on university-business cooperation</p> <p>4.3 To create EXPO identity, founding documents, guidelines and materials</p> <p>4.4 To constitute EXPO managing structures and plan of work</p> <p>4.5 To implement EXPO</p> <p>4.6 To extend EXPO membership and revise university-business cooperation work plan</p>		
Estimated Start Date (dd-mm-yyyy)	15-07-2020	Estimated End Date (dd-mm-yyyy)	30-09-2022
Lead Organisation	<p>P8 UNIVERSITY MARIBOR (UM),</p> <p>P1 UNIVERSITY OF BANJA LUKA (UNIBL)</p>		

Work package IV - Creation of university-business cooperation platform

Plantaze

 Jaffa-komerc


Jaffa-komerc



УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA



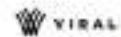
AGROVOĆE

Work package IV - Creation of university-business cooperation platform

<http://viralerasmus.org/en/ict-in-agriculture/>



УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA



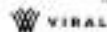
IRAL

PILOT PROJECT: "Plot for Brand Protection and Anti-Counterfeiting in Wine Industry" - Tag@Wine

- Project is training within EU programmes for research and innovation for period from 2014-2020, for the period of one year
- Project leader: iriNET / Iri Ltd
- Partners:
 - „13 jul Plantaze“ s.p. (Slovenia)
 - Faculty of Information Systems and Mathematics, University of Ljubljana, Slovenia
 - Iri Ltd (Slovenia)
- The aim of project:

The aim of this project is to test Tag@Wine technology for the goal of wine of brand protection and the prevention of counterfeiting in the wine industry, using modern market of things, technologies as a platform, through the development of "tag@Wine" (tag@Wine and smart tags on QR codes, NFC) and smart tags for bottles / boxes.

Tag@Wine project consists of cloud and mobile applications with readers printing each uniquely for functional sites. The goal is to have users produce legitimate, trustworthy and controlled, working better efficiency quality and reduce costs expenditures.



IRAL

Plantaze

Work package V - Knowledge transfer across agri-community

Work package type and ref.nr	DEVELOPMENT	WP.5
TITLE	KNOWLDEGE TRANSFER ACROSS AGRI-COMMUNITY	
Tasks	<p>5.1 To implement student crash courses</p> <p>5.2 To organize knowledge transfer seminar for extension service providers</p> <p>5.3 To organize knowledge transfer seminar for agronomists and agriculture cooperatives</p> <p>5.4 To organize knowledge transfer seminar for policy makers in AET</p> <p>5.5 To organize knowledge transfer seminar for agriculture businesses</p>	



Work package VI - Quality assurance

Work package type and ref.nr	QUALITY ASSURANCE	WP.6
TITLE	QUALITY ASSURANCE	

Tasks	6.1 To organize Quality team meetings 6.2 To carry out 2 progress evaluations 6.3 To carry out external evaluation 6.4 To carry out verification of costs		
Estimated Start Date (dd-mm-yyyy)	15-10-2019	Estimated End Date (dd-mm-yyyy)	14-10-2022



WEBIN
Western Balkans Institute



Work package VII - Dissemination & Exploitation

Work package type
and ref.nr

DISSEMINATION & EXPLOITATION

WP.7

TITLE

RESULTS DISSEMINATION & EXPLOITATION

Tasks

- 7.1 To provide for project web portal regular maintenance
- 7.2 To organize internal institutional dissemination events
- 7.3 To carry out small-scale improvements of agriculture teaching practice
- 7.4 To carry out media promotion
- 7.5 To organize dissemination conference



WEBIN
Western Balkans Institute



FAKULTET ZA POLJOPRIVREDU I
IZUMIŠTVA
UNIVERZITET U BEOGRADU

Work package VIII - Management

Work package type and ref.nr	MANAGEMENT	WP.8
TITLE	MANAGEMENT	

Tasks

- 8.1 To organize Kick off meeting and and deliver PM training
- 8.2 To organize Steering Committee meetings
- 8.3 To provide for smooth daily project management and administration

**Estimated Start Date
(dd-mm-yyyy)**

15-10-2019

**Estimated End Date
(dd-mm-yyyy)**

14-10-2022

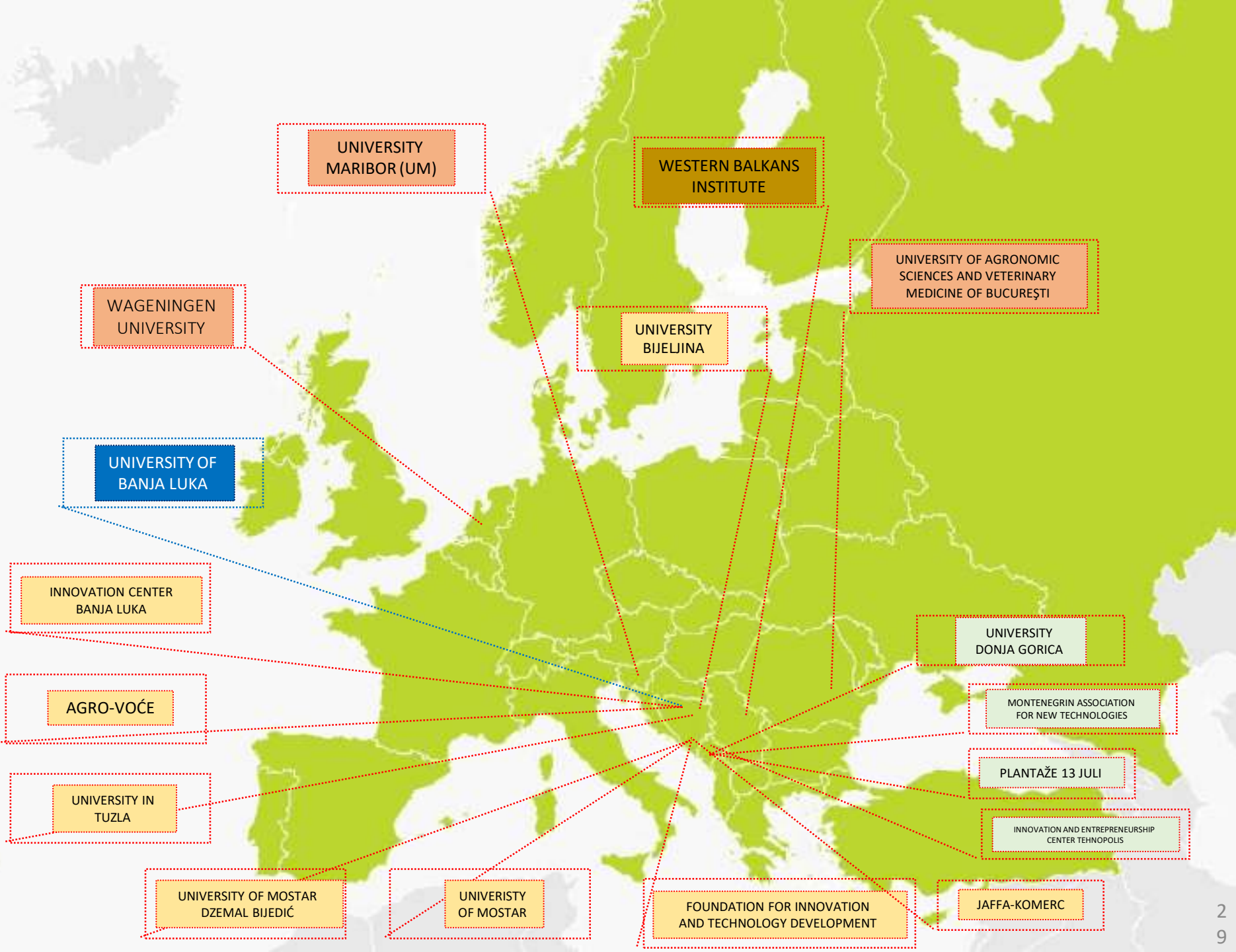


УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA

Partners

(university, company, NGO)





Duration:
november 2019 – october 2022



Budget:
888.000 €

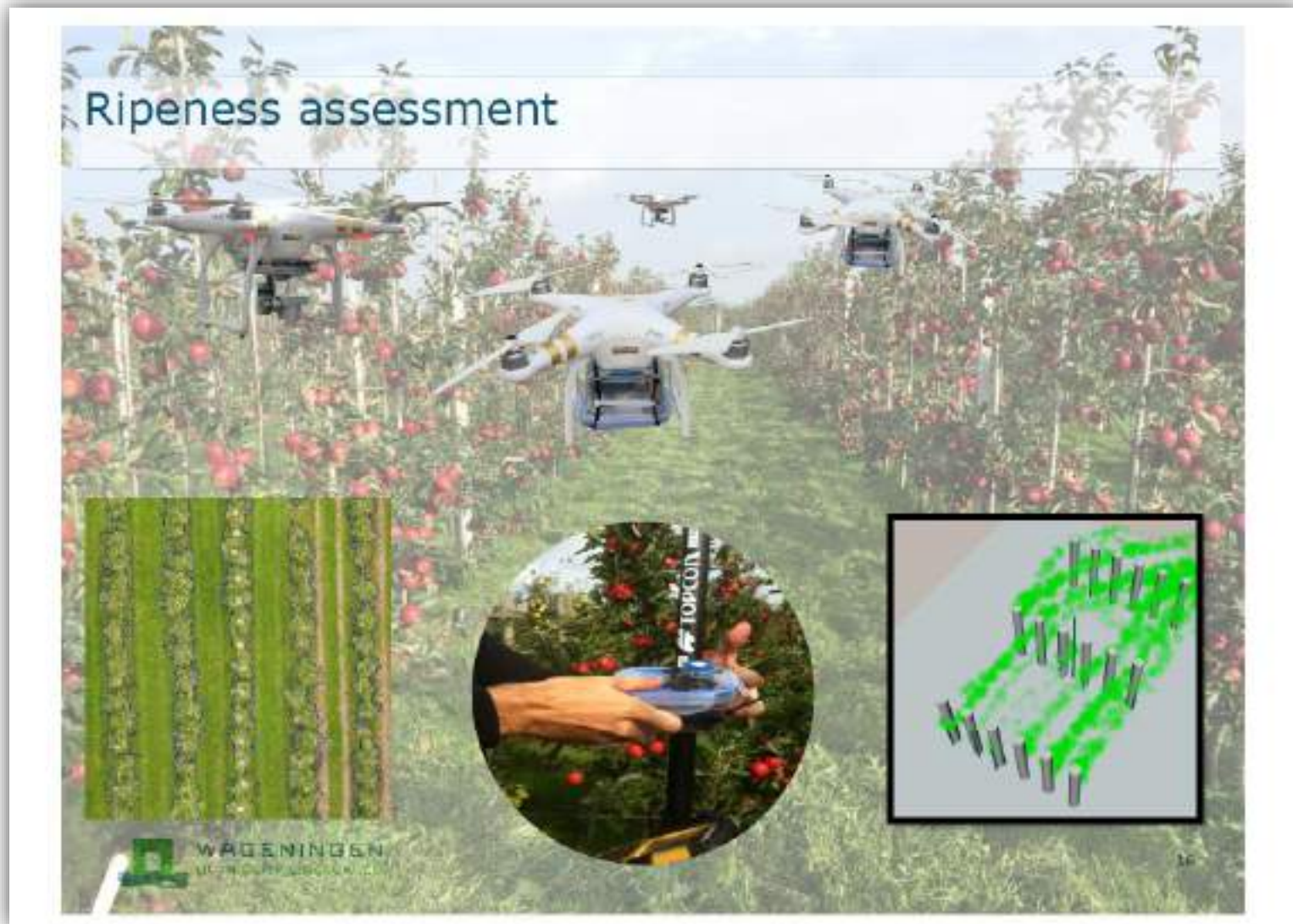


Variables and applications



*Credit:
João Valente*

*presentation: Drones in Agriculture, 16.09.2020.
(available online in coming days)*



Credit:
João Valente
presentation: Drones in Agriculture, 16.09.2020.
(available online in coming days)

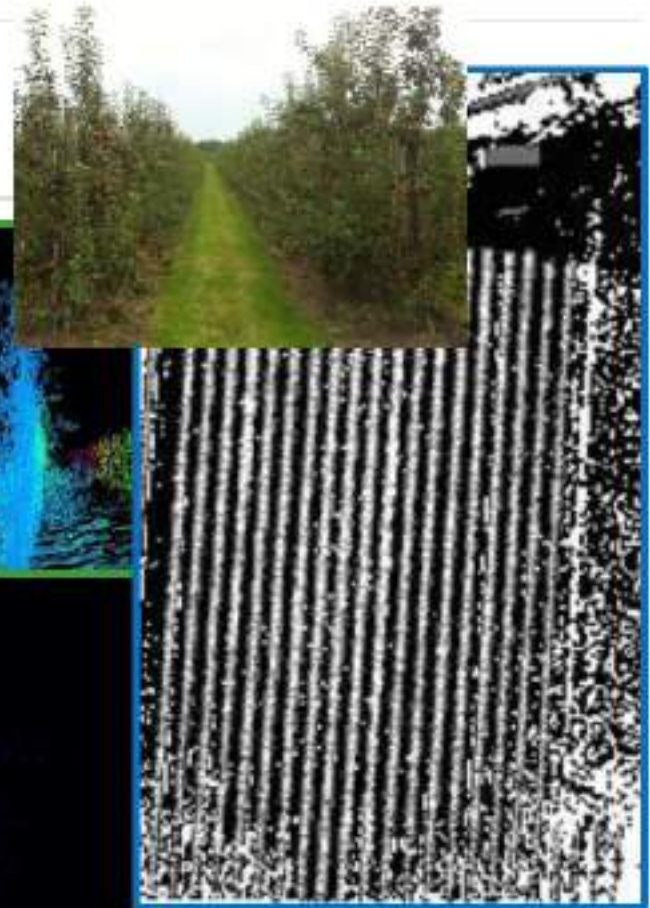
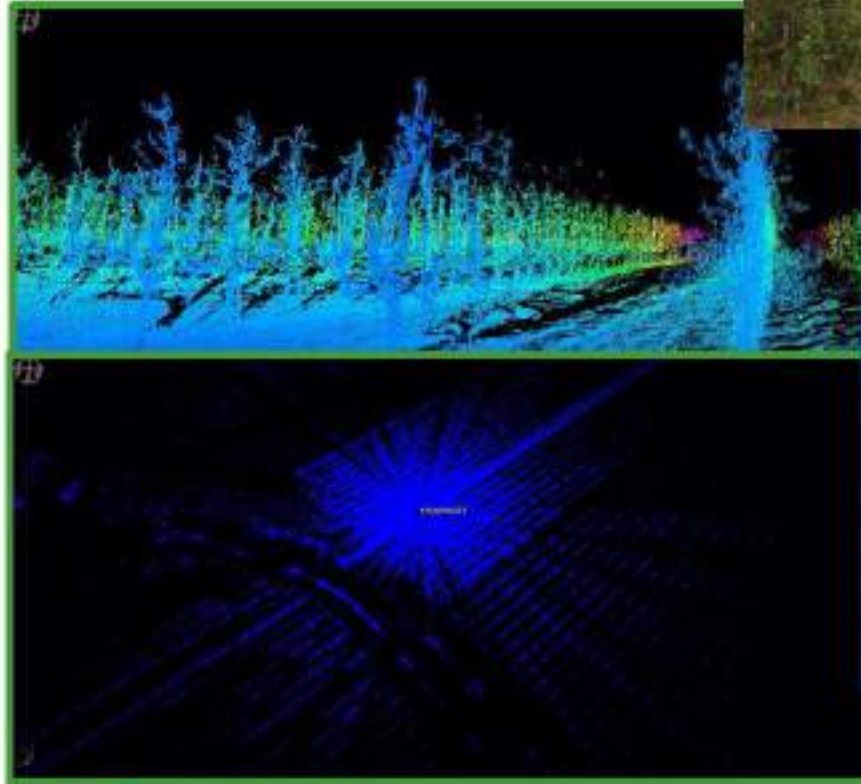
Flower blossom estimation



*Credit:
João Valente*

*presentation: Drones in Agriculture, 16.09.2020.
(available online in coming days)*

Tree height monitoring

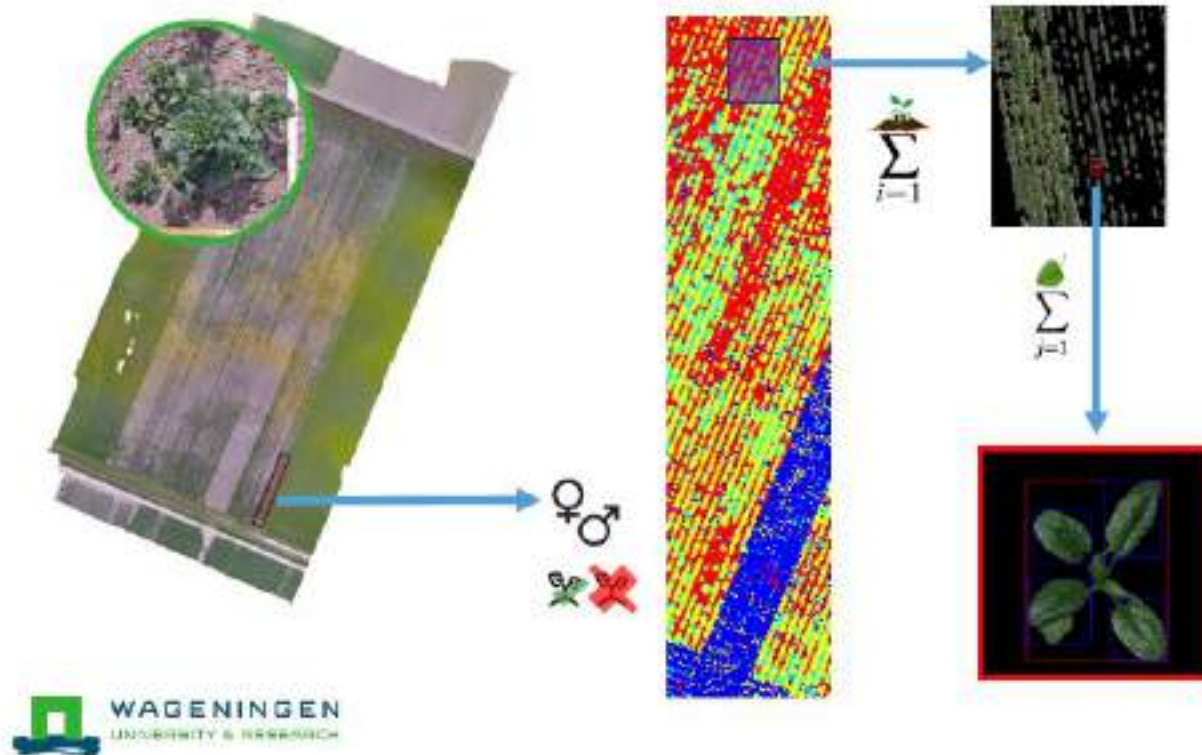


18

Credit:
João Valente
presentation: Drones in Agriculture, 16.09.2020.
(available online in coming days)

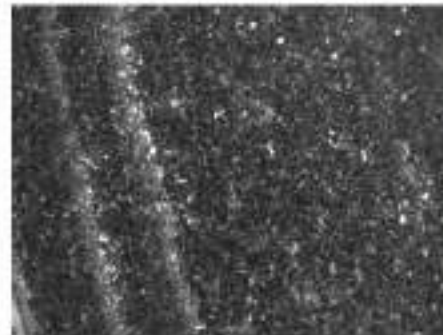
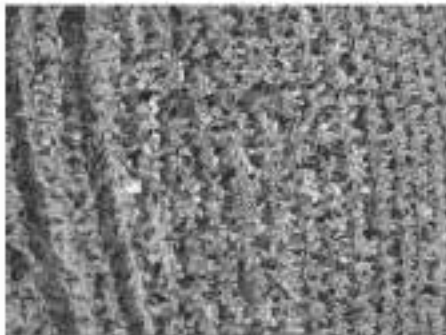
Plant breeding

Pretrained AlexNet convolutional neural network



Credit:
João Valente
 presentation: *Drones in Agriculture*, 16.09.2020.
 (available online in coming days)

Ripeness assessment



Mask R-CNN

20

Credit:
João Valente
presentation: Drones in Agriculture, 16.09.2020.
(available online in coming days)

Weed detection

Multiple pretrained convolutional neural network



Credit:
João Valente
presentation: Drones in Agriculture, 16.09.2020.
(available online in coming days)

Contact

<http://viralerasmus.org/>
viral.erasmus@unibl.org



project coordinator
Associate professor, Miljan Cvetković

Thank you !



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AGRICULTURAL LEARNING