DEEPFARM Project: Yaşar University (YU)

Assist. Prof. Ruhan AŞKIN UZEL

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1. Training & Capacity Building in Türkiye

- Successfully coordinated a hybrid training cohort of 33 participants, including 28 students
- A comprehensive study on olive tree life cycle, irrigation and soil requirements, deseases and agricultural spraying against olive tree diseases

Figure 1. Students visiting Olive Research Institute

Figure 2. Students participating in Summer School in Yaşar University

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1. Training & Capacity Building in Türkiye

- Conducted lab sessions focused on Phython programming, including frameworks and basic statistics.
- Hands-on sessions to familiraze professors with advanced digital tools:
  - agricultural sensors
  - data analytics platforms

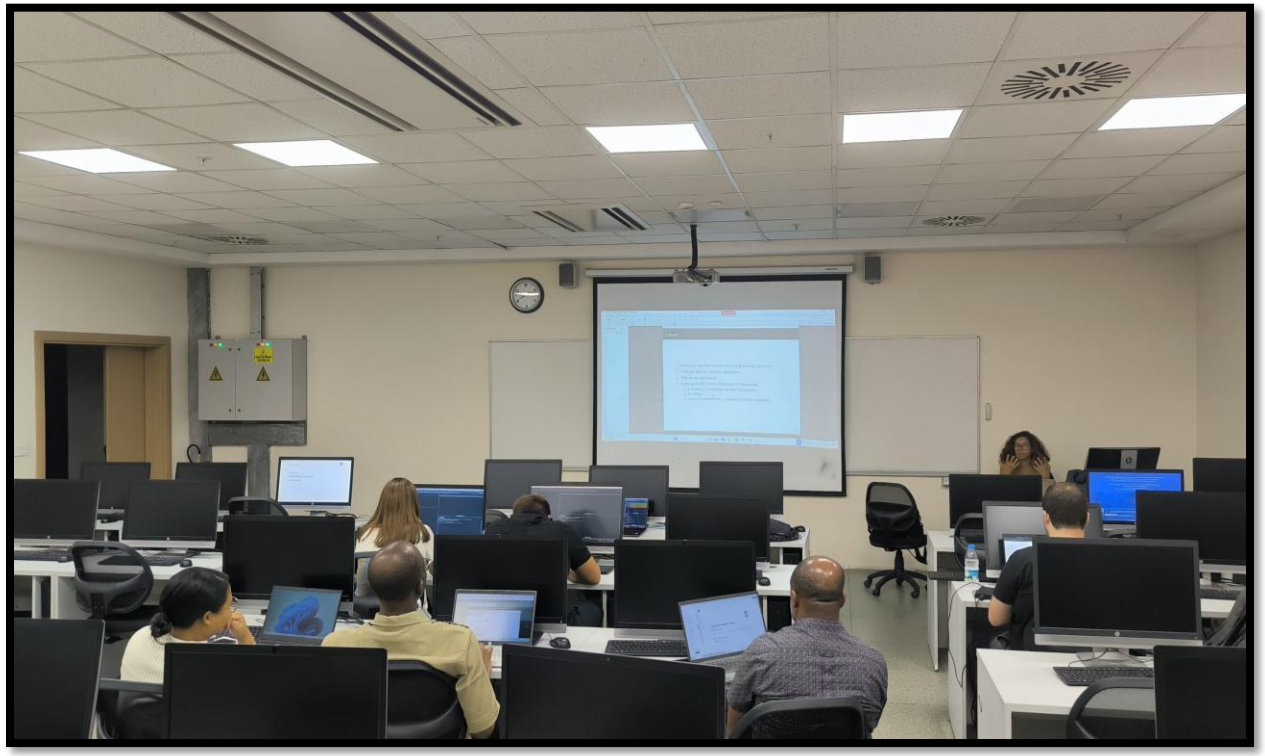

Figure 3. Lab sessions taking place in Yaşar University

1. Training & Capacity Building in Türkiye

- Observed and participated in experimentation in Microbiology labs to enhance practical scientific knowledge

Figure 4. Students doing experiments on Olive and other oil acidity in Microbiology Lab

Figure 5. Students visiting labs in Olive Research Institute, observing experiments

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1. Training & Capacity Building in Türkiye

- Training included a visit to the **Ministry of Agriculture and Forestry International Agricultural Research and Training Center** and **Olive Research Institute** in Izmir

Figure 6. A visit to International Agricultural Research and Training Center

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2. Bridging Theory & Fieldwork

- On Year 2, we expanded student participants, managing 46 students (28 last year)
- After completing theoretical briefings, we transitioned the cohort into Phase 2: on-field observations and data collection in Olive Research Institute

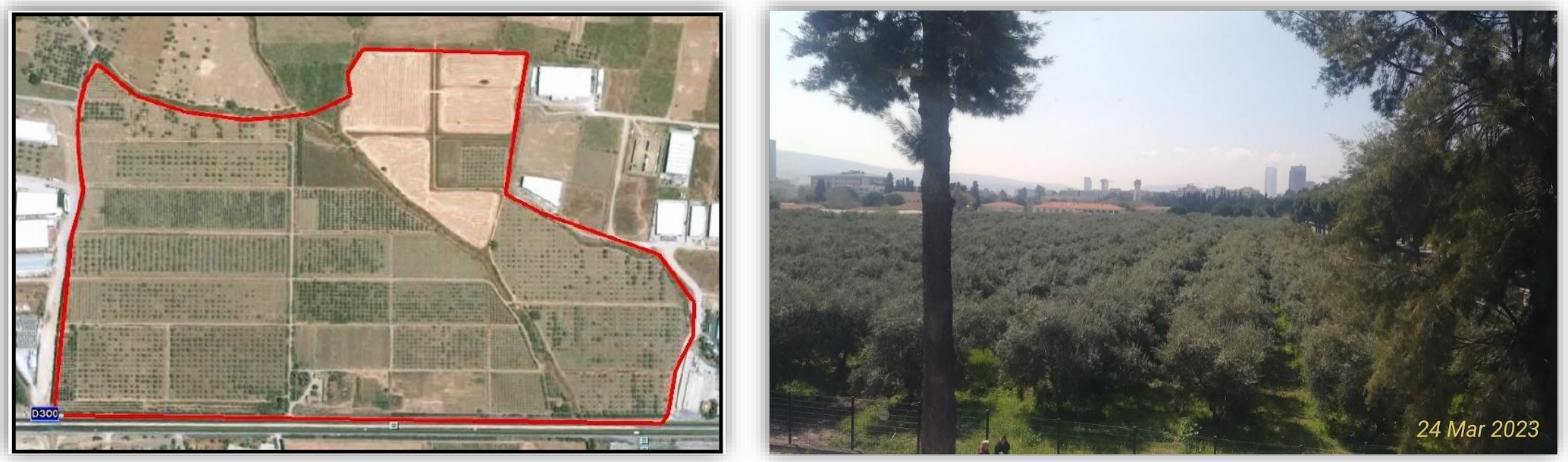

Figure 7. Dedicated Olive Farm Site in Olive Research Institute - İzmir

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3. Data Collection

- On-site observations were conducted every 3 weeks
- We directed students to perform on-site checks of installed sensors during visits, reporting critical environmental metrics including:
  - temperature,
  - soil humidity,
  - soil temperature and
  - wind speed

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3. Data Collection

- We trained students to manually inspect trees and report on developmental stages, pests and disease symptoms
- We mendated the collection of visual evidence of both healthy and unhealthy leaves, building dataset for future analysis

Figure 8. Students inspects their assigned trees, taking visual evidence of leaves

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We conducted scheduled drone flights, ensuring aerial data matched phenological stages

Figure 9. Drone operator lecturing students on drones and field operations

Figure 10. The drone used for DEEPFARM Olive operations

Figure 11. Drone RGB Survey Image

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4. Key Outputs & Deliverables

Deliverable No (continuous numbering linked to WP)	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month number)	Description (including format and language)
D3.1	Requirements and preparatory actions for Turkey programme	3	YASARU	R	SEN	M7	Informationa bout students recruited and training provided
D3.2	Olive PoC results	3	YASARU	R	PU	M12	Description of the PoC in Olive, characteristics, implementation process and results obtained
D3.3	GRADEO for digital Agriculture in Olive crop	3	YASARU	DEM	PU	M23	Online training content produced to be available
							as a MOOC in FUN platform
D3.4	New data of Olive crop	3	ESTIA	DATA	PU	M23	Real data from olive crop PoC to be available in the DATA LAB
D3.5	Report on training sessions for Turkey-Y1	3	YASARU	R	SEN	M12	Progress about the taining sessions with release after year 1
D3.6	Report on training sessions for Turkey-Y2	3	YASARU	R	SEN	M23	Progress about the taining sessions with release after year 2

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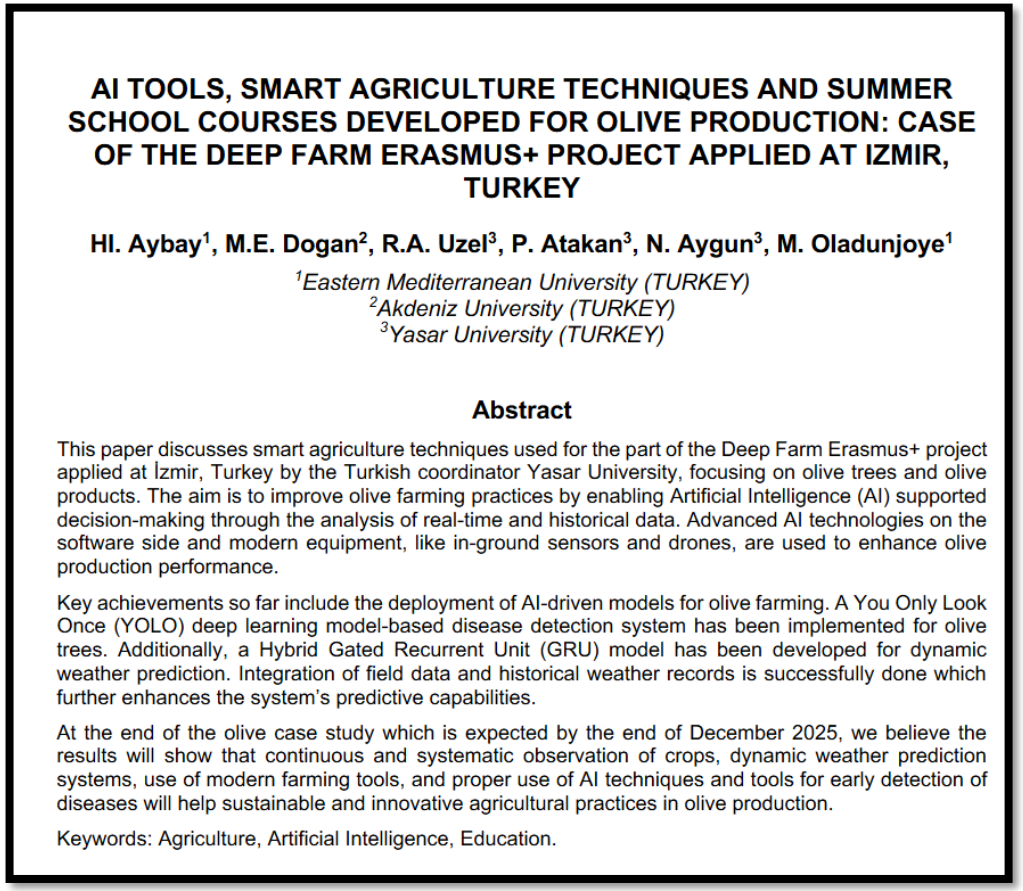
4. Key Outputs & Deliverables

- We shared our work in EDULEARN25 Conference / Spain
- We submitted an article to AI in Agriculture Journal



AI TOOLS, SMART AGRICULTURE TECHNIQUES AND SUMMER SCHOOL COURSES DEVELOPED FOR OLIVE PRODUCTION: CASE OF THE DEEP FARM ERASMUS+ PROJECT APPLIED AT IZMIR, TURKEY

HI. Aybay[1], M.E. Dogan[2], R.A. Uzel[3], P. Atakan[3], N. Aygun[3], M. Oladunjoye[1]

[1]Eastern Mediterranean University (TURKEY)
[2]Akdeniz University (TURKEY)
[3]Yasar University (TURKEY)

Abstract

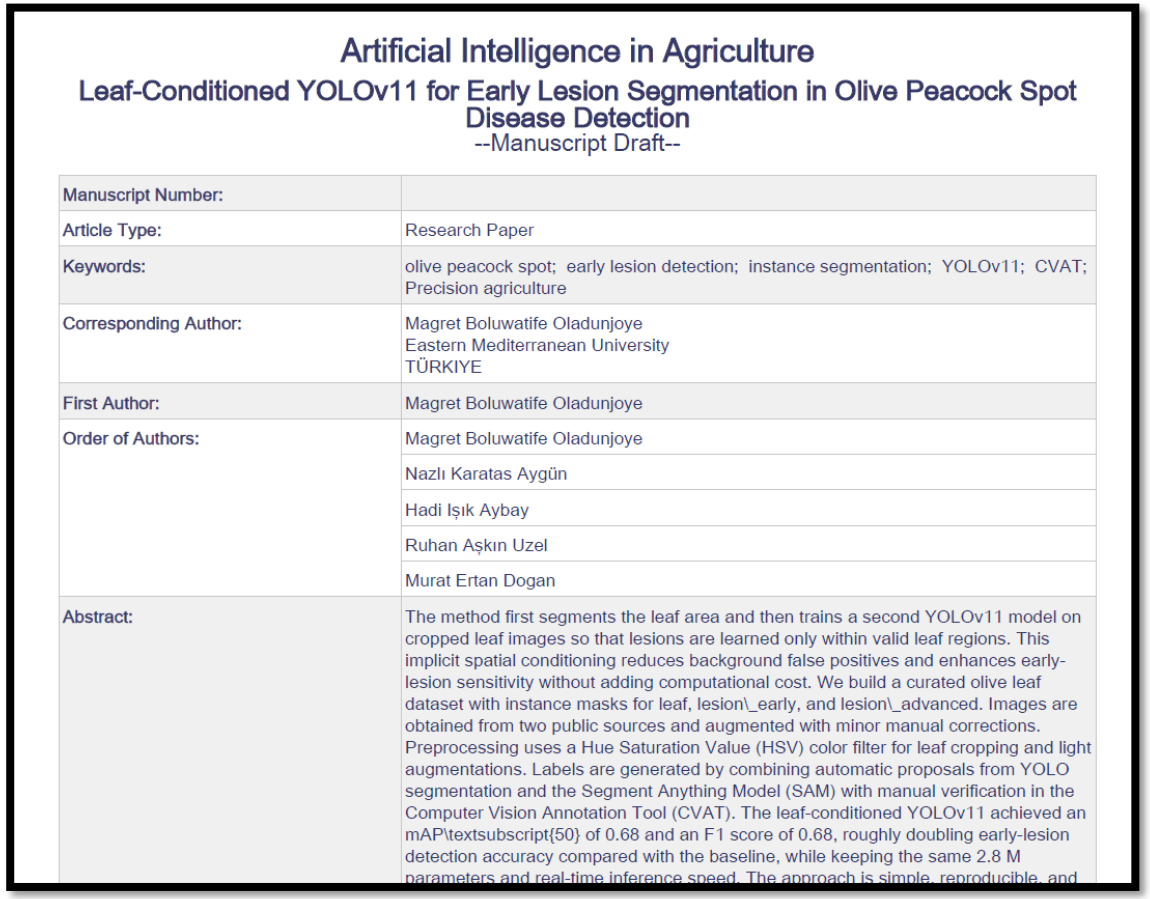
This paper discusses smart agriculture techniques used for the part of the Deep Farm Erasmus+ project applied at İzmir, Turkey by the Turkish coordinator Yasar University, focusing on olive trees and olive products. The aim is to improve olive farming practices by enabling Artificial Intelligence (AI) supported decision-making through the analysis of real-time and historical data. Advanced AI technologies on the software side and modern equipment, like in-ground sensors and drones, are used to enhance olive production performance.

Key achievements so far include the deployment of AI-driven models for olive farming. A You Only Look Once (YOLO) deep learning model-based disease detection system has been implemented for olive trees. Additionally, a Hybrid Gated Recurrent Unit (GRU) model has been developed for dynamic weather prediction. Integration of field data and historical weather records is successfully done which further enhances the system's predictive capabilities.

At the end of the olive case study which is expected by the end of December 2025, we believe the results will show that continuous and systematic observation of crops, dynamic weather prediction systems, use of modern farming tools, and proper use of AI techniques and tools for early detection of diseases will help sustainable and innovative agricultural practices in olive production.

Keywords: Agriculture, Artificial Intelligence, Education.

Figure 12. Proceedings of EDULEARN25 Conference



Artificial Intelligence in Agriculture

Leaf-Conditioned YOLOv11 for Early Lesion Segmentation in Olive Peacock Spot Disease Detection

--Manuscript Draft--

Manuscript Number:	
Article Type:	Research Paper
Keywords:	olive peacock spot; early lesion detection; instance segmentation; YOLOv11; CVAT; Precision agriculture
Corresponding Author:	Magret Boluwatife Oladunjoye Eastern Mediterranean University TÜRKIYE
First Author:	Magret Boluwatife Oladunjoye
Order of Authors:	Magret Boluwatife Oladunjoye
	Nazlı Karatas Aygün
	Hadi Işık Aybay
	Ruhan Aşkın Uzel
	Murat Ertan Dogan
Abstract:	The method first segments the leaf area and then trains a second YOLOv11 model on cropped leaf images so that lesions are learned only within valid leaf regions. This implicit spatial conditioning reduces background false positives and enhances early-lesion sensitivity without adding computational cost. We build a curated olive leaf dataset with instance masks for leaf, lesion_early, and lesion_advanced. Images are obtained from two public sources and augmented with minor manual corrections. Preprocessing uses a Hue Saturation Value (HSV) color filter for leaf cropping and light augmentations. Labels are generated by combining automatic proposals from YOLO segmentation and the Segment Anything Model (SAM) with manual verification in the Computer Vision Annotation Tool (CVAT). The leaf-conditioned YOLOv11 achieved an mAP\textsubscript{50} of 0.68 and an F1 score of 0.68, roughly doubling early-lesion detection accuracy compared with the baseline, while keeping the same 2.8 M parameters and real-time inference speed. The approach is simple, reproducible, and

Figure 13. Scientific Paper Submission

Thanks for listening.....

Assist. Prof. Ruhan AŞKIN UZEL

ruhan.uzel@yasar.edu.tr