Dijital Dönüşüm & Uluslararası İş Birliği Fırsatları

İstanbul Sanayi Odası, Odakule

16 Ekim 2025 - Bilgilendirme Oturumu & Yüz yüze İkili Görüşmeler
17-30 Ekim 2025 - Çevrim içi İkili Görüşmeler

Doç. Dr. Ahmet Cevahir ÇINAR
Selçuk Üniversitesi
Sentius Teknoloji Yazılım Ltd. Şti.

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Selçuk University, Faculty of Technology, Department of Computer Engineering

Selçuk University, Konya (Türkiye)
+70,000 students
+2,500 academic staff.
The **Faculty of Technology** bridges engineering education with applied R&D, entrepreneurship, and digital transformation.
The **Department of Computer Engineering** specializes in artificial intelligence, data science, optimization, and software systems engineering, fostering strong university–industry collaboration.

Sentius Technology Software Industry and Trade Ltd.

Sentius Technology is an AI and software development SME based in **Konya Technopark, Türkiye**.

The company specializes in **AI-powered data analytics, automation systems, and digital agriculture solutions**, serving both academic and industrial clients. It combines deep research capacity with agile product development.

SENTİUS

Project 1 – SENTI-COMP: Synthetic and Ethical AI Data Ecosystem

HORIZON-CL4-2025-03-DATA-13: Fostering Innovative and Compliant Data Ecosystems (IA) (AI, Data and Robotics Partnership)

Coordinator or Partner

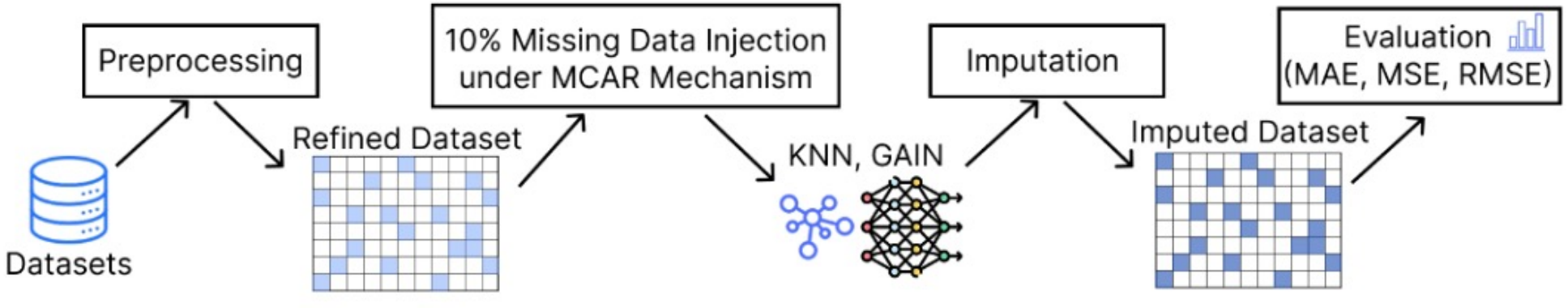
An **AI-driven synthetic data generation and completion platform** will be developed to address missing, biased, and confidential data limitations in health and agriculture domains. The system will ensure GDPR and AI Act compliance, secure data sharing, and ethical-by-design architecture.

Objectives:

- Generate synthetic data to overcome real-world data gaps
- Improve data quality, diversity, and representativeness for AI models

Expected Results:

- Achieve secure, compliant, and high-quality AI data ecosystems in Europe
- Enhance the accuracy, fairness, and reusability of AI models



Missing Data Imputation in Healthcare Datasets Using GAIN and KNN

Kadriye Nur Erman[1], *Ahmet Cevahir* Cinar[2*]

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[2]Department of Computer Engineering, Faculty of Technology, Selcuk University, Konya, Turkiye

Abstract. Missing data in health-related datasets poses a significant challenge to data analysis processes and adversely affects the accuracy of decision support systems. In this study, two imputation methods— the statistically grounded K-Nearest Neighbors (KNN) algorithm and a deep learning-based approach known as Generative Adversarial Imputation Nets (GAIN)—are examined and compared. While KNN offers a simple and interpretable non-parametric solution, GAIN employs a complex artificial neural network architecture composed of generator and discriminator networks to estimate missing values. These two methods, differing in structural complexity, were evaluated on 14 publicly available health datasets characterized by small sample sizes and limited dimensionality. The missing rate was set at 10%, and missing values were simulated under the Missing Completely at Random (MCAR) mechanism. Performance was assessed using Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and computational time as evaluation metrics. The results indicate that the KNN method yields more consistent and accurate results on datasets with small sample sizes and low dimensionality. On the other hand, GAIN demonstrated promising potential, particularly in handling larger and more complex datasets.

Keywords: GAIN, healthcare data, KNN, MCAR, missing data imputation

Project 2 – AI4CROPS: Copernicus-Driven Digital Agriculture

HORIZON-CL4-2025-02-SPACE-45 — Supporting the AI/ML Digital Transition of Copernicus Services (RIA)

Coordinator or Partner

The project aims to integrate **AI and machine learning pipelines into Copernicus data workflows**, enhancing agricultural monitoring, drought forecasting, and vegetation health assessment. The system will fuse Sentinel-2, meteorological, and ground-sensor data using explainable and trustworthy AI.

Objectives:

Embed AI/ML modules into Copernicus workflows for crop and drought monitoring

Develop explainable, interoperable, and open-source AI models for Earth observation

Expected Results:

Achieve operational readiness for AI-enhanced Copernicus services

Provide farmers and policymakers with real-time, evidence-based decision tools

CROP4EARLY: Edge-AI Powered Early Warning System for Drought and Nutrient Deficiency in Cereal Crops

Agricultural Engineer (M.Sc)

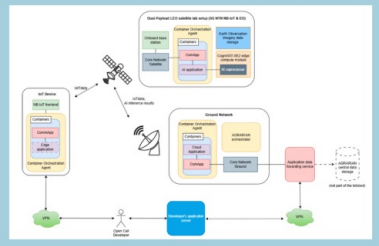
Barley and Wheat Parcels

4 to 10 Small or Medium Farms

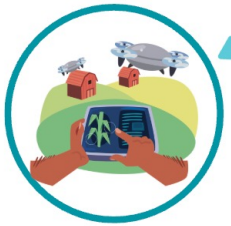
NDVI & NDRE Sensors

NB-IoT sensor data

Image Processing



Testbed 3 (SATELIOT & UBOTICA)



Mobile Friendly Web Application

Small or Medium Farm Users

OUTPUTS:

- Fertilization Recommendations
- Irrigation Suggestions
- Nutrient Diagnostics
- Crop Stress and Health Maps
- Time-Series Tracking
- Field Summary Reports

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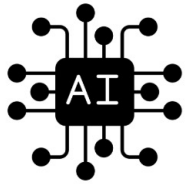
Technology Provider



AI Model

SELÇUK ÜNİVERSİTESİ KONYA - 1975

Academic Support

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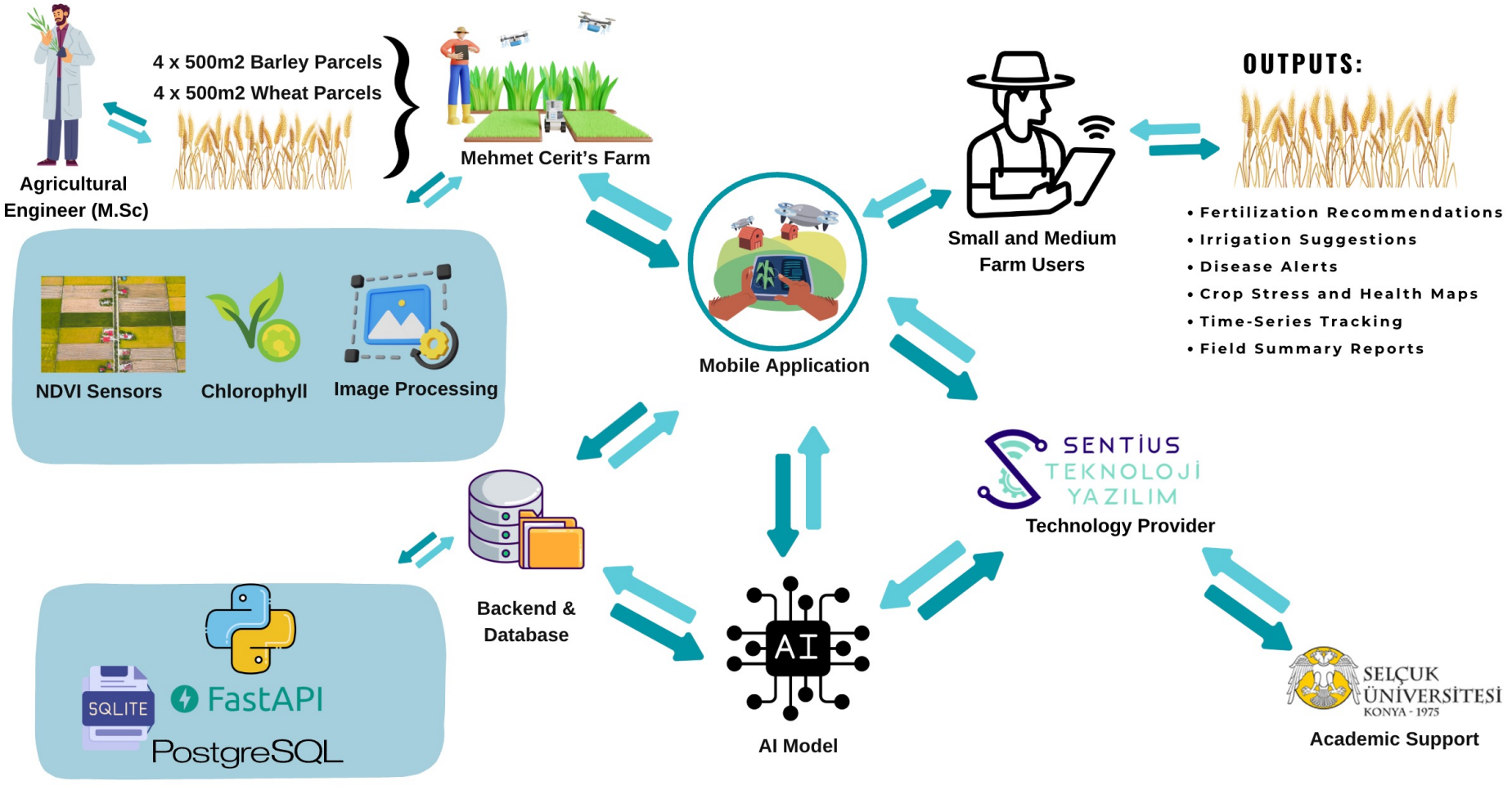
DIFARM-GRAIN: AI-Powered Mobile Monitoring and Early Warning System for Wheat and Barley Farming



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Project 3 – GEN-MAINTAIN: Generative AI for Predictive Industrial Maintenance

HORIZON-CL4-2025-03-DIGITAL-EMERGING-07 — Robust and Trustworthy Generative AI for Robotics and Industrial Automation (RIA)

Coordinator or Partner

An **AI-based predictive maintenance and digital twin system** will be developed for industrial plants. By leveraging generative AI, the solution will simulate equipment behavior, predict failures, and optimize production efficiency and energy consumption.

Objectives:

Develop reliable generative AI models for industrial automation

Integrate digital twin technologies for predictive maintenance and energy optimization

Expected Results:

Achieve cost-efficient, autonomous, and sustainable manufacturing processes

Accelerate Europe’s transition toward AI-enabled Industry 5.0

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FORESTWIN: Forecasting and Resource Optimization with AI and Metaheuristics in Digital Twin Environments

kaggle

Product Demand Forecasting

Manufacturing Production Data

Data Cleaning

Data Preprocessing

Feature Engineering

Step 1 – Data Collection and Preparation

AI-based forecasting methods

Long Short-Term Memory Networks (LSTM)

Gated Recurrent Unit Networks (GRU)

Extreme Gradient Boosting (XGBoost)

Random Forest (RF)

Support Vector Regression (SVR)

ABC/XYZ classification

Step 2 – AI-based Demand Forecasting

Metaheuristic optimization algorithms

Genetic Algorithm (GA)

Particle Swarm Optimization

Artificial Bee Colony

Differential Evolution

Tree Seed Algorithm

Step 3 – Metaheuristic Optimization

Digital Twin Development

DES

Discrete Event Simulation (DES)

SimPy

SimPy

Step 4 – Digital Twin Development

Dashboard and Decision Support

Dash Python

Streamlit

Streamlit

FastAPI

PostgreSQL

Step 5 – Dashboard and Decision Support

Validation and Testing

1 Validation with open datasets

2 Smart and Agile Assembly Lab MOVE Platform

3 Conduct Industrial Pilot

Step 6 – Validation and Testing

AID4SME

This project submitted by Sentius Technology Software Ltd. from Konya, Türkiye

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We are open to collaboration with universities, SMEs, and technology clusters in Europe for co-developing AI solutions in data, agriculture, and industry.

Thank you…

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