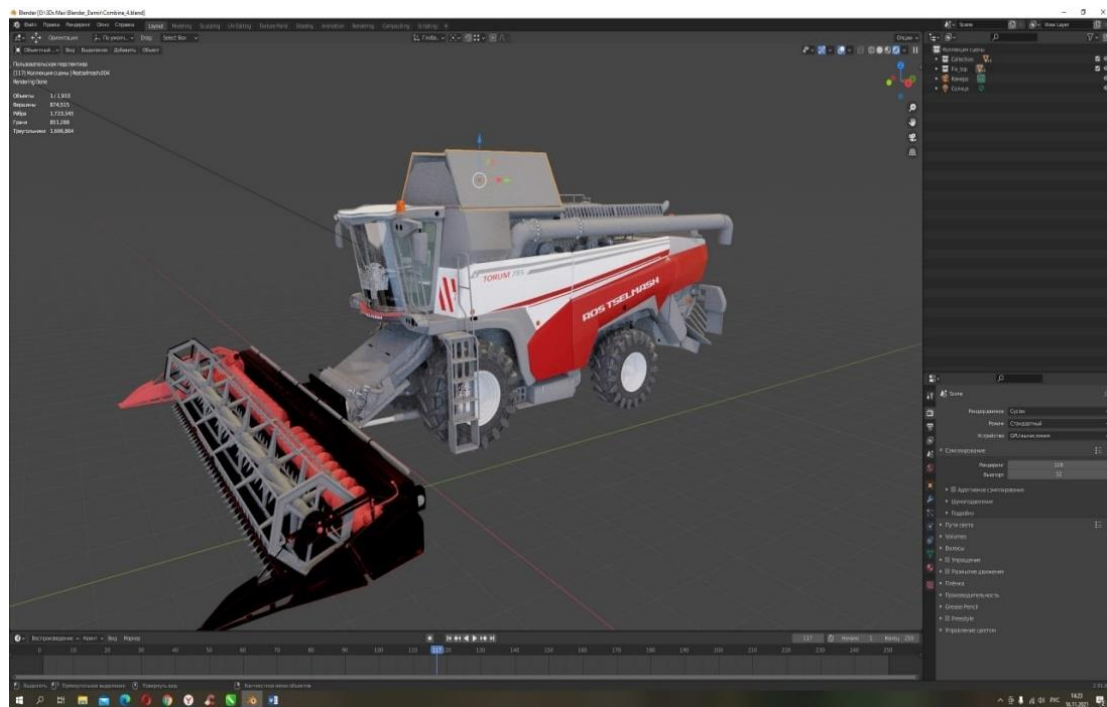# Implementation of Competencies of the Future through the Integration of Digital Twin Technologies, Virtual and Augmented Reality into the Educational Process

Rector of FSBEI HE Saratov State Vavilov Agrarian University
 Solovev Dmitry Alexandrovich

February 15, 2022

Integration of Digital Competencies into Educational Programs

During the transition to the new educational standards of the FSES 3 ++ in 2019-2021 all integrated groups of educational programs were updated and disciplines on digitalization were introduced in the relevant areas

100% of educational programs contain disciplines for digital competences:

- Visualization and 3D modeling;

- Information technology in the agro-industrial complex;

- Intelligent control systems;

- Digital twins;

- Digital technologies in agro engineering

- Digital technologies in veterinary medicine

- Digital technologies in agronomy

- Computer modeling in agricultural production

- Robotic hardware in agricultural production

VAVILOV Platform for a Consortium of the Volga Federal District Universities as Part of the Priority 2030 Program

Features

- Dealing with agro classes of rural schools;

- Innovative digital solutions for agribusiness

- Extracurricular professional programs with digital models

Establishing Digital Competence Centers as Part of the Priority 2030 Program

Targets

- DCC in agro engineering;
- DCC in veterinary medicine, food and biotechnology

Implementation phases

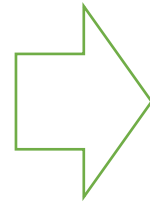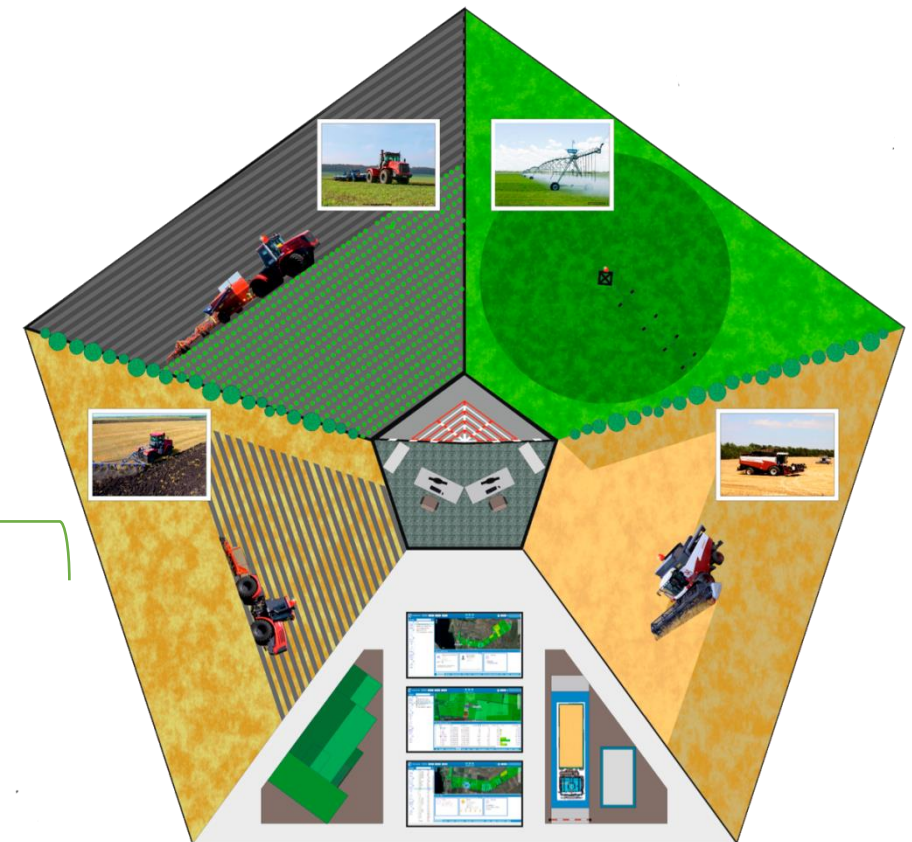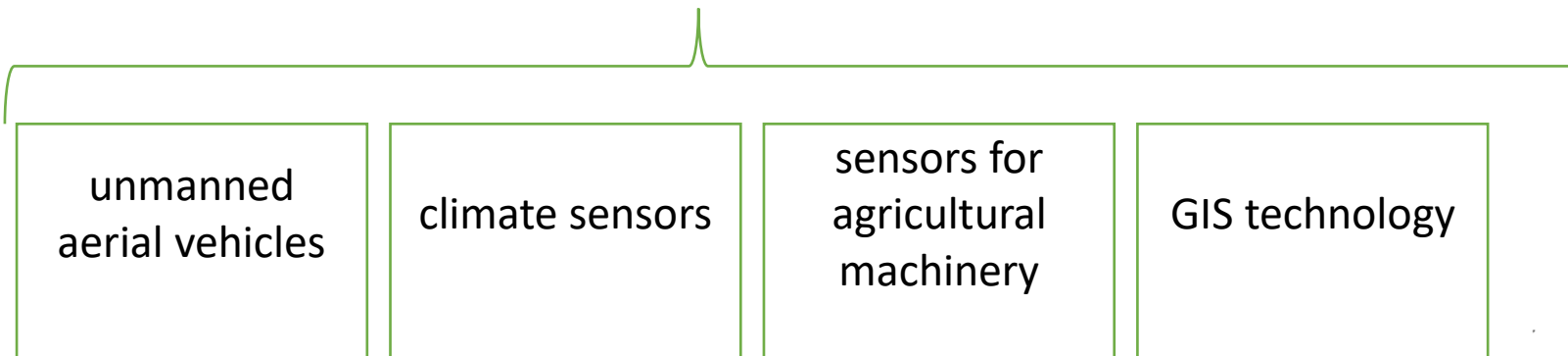| Education: Academic staff, postgraduates, students	Internships: Business, research institutes, universities	Creation of digital models and twins of the VAVILOV agrobiotechnopark	Science-intensive breakthrough research

"Digital twin" of an Agricultural Enterprise Based on Scientific Training and Production Complexes "Povolzhye" and "Mummovskoye" of Saratov State Agrarian University

-fertilization;
- field consistence;
-harvest;
-machinery movement ;
-feed consumption;
-animal health;
-herd rotation.

-harvest forecast;
-control of machinery parameters;
-detection of animal diseases;
-reduction of all types of costs.

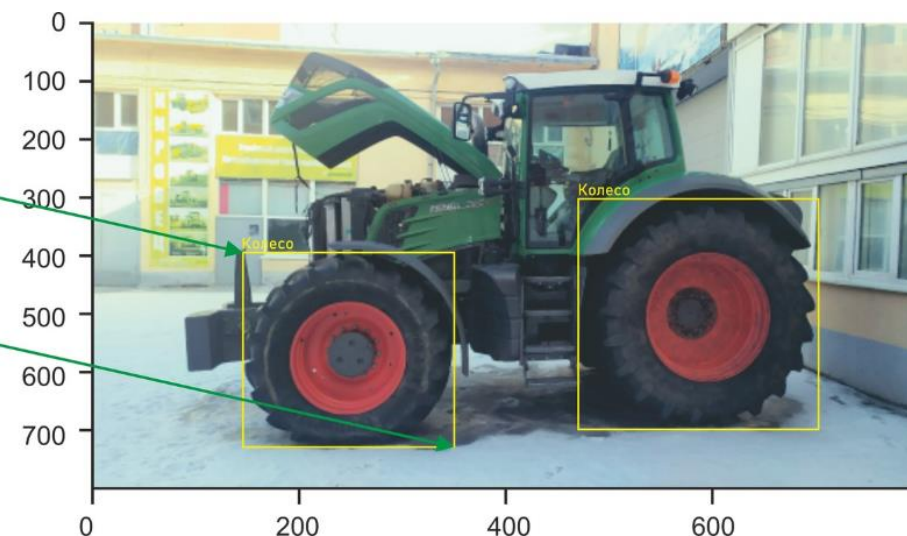| unmanned aerial vehicles | climate sensors | sensors for agricultural machinery | GIS technology |

Industrial Partner: LLC «Infobis», implementing the «Agrosignal» project in the Russian Federation (more than 6 million hectares) and the CIS countries

Innovative Platforms: Center of Agro-robotics, VR/AR-Technologies of Saratov State Agrarian University
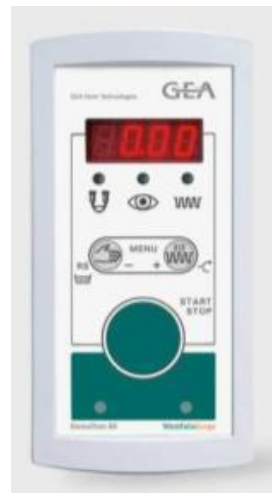
Industrial partners:

- **CLAAS,**
- **FENDT dealer service**
- **OJSC Minsk Tractor Plant**
- **JSC Rostselmash**

Innovative Platforms: Digital Animal Breeding Center of Ulyanovsk State Agrarian University

- A unique model of a digital farm with a full cycle: feeding, housing, milking, management and treatment

- Milking room: milking herd control devices, digital classroom, control software

- Recognition system for automatic registration and processing of parameters of any animal

- Cowscout system - informs about the best moment for insemination, registers the movement, eating feed, sanitary and veterinary safety of the animal

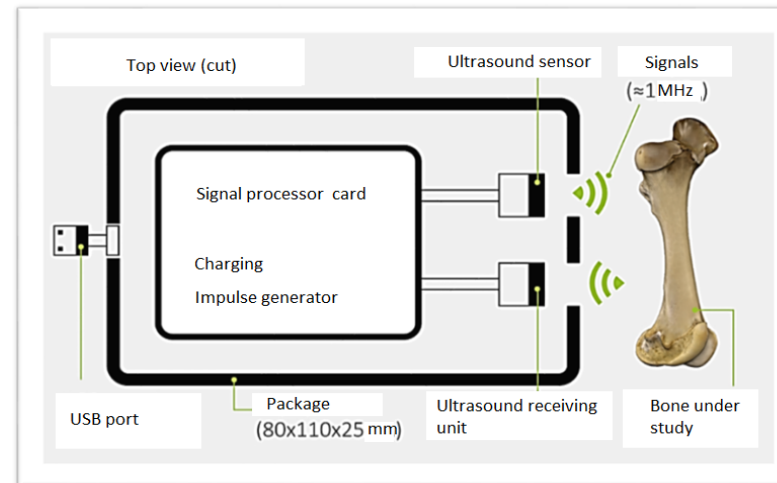# Innovative Digital Solutions of Samara State Agrarian University

Digital training material "Interactive anatomical 3D-atlas of a farm animal"

✓ Anatomically accurate tissue detailing
✓ 3D model allows you to see the object at any angle
✓ Ability to study each tissue separately
✓ Tips with the name and description of objects
✓ Modeling any combination of anatomical formations
✓ Intuitive familiar interface and ease of use

Diagnostic instrument "Ultrasonic echoosteometer for diagnosing disorders of mineral metabolism and physiological status of animals"

✓ Rapid diagnosis of up to 90% of physiological problems in animals
✓ Identification of nutritional deficiencies
✓ Light weight and ease of use
✓ Independence of operation up to 5 hours
✓ Formation of a measurement database and tracking of dynamics

Thank you for your attention!