

configuration of the aircraft. We will discuss 2 most used algorithms:

- Protecting wing mechanization against exceeding  $V_{fe}$  speed (maximum operational speed with mechanization released).

- Over-speed protection  $V_{mo}$  (maximum operational speed in flight configuration).

If the aircraft is dispersed in the take-off or landing configuration, then with the maximum operating speed achieved and mechanization released, the mechanization is automatically deflected at a smaller angle. If acceleration is performed in flight configuration, with the flaps not released, then when the maximum operating speed is reached in the flight configuration, an automatic release of spoilers will occur. If this occurs in a descent, then simultaneously with the release of the spoilers, the angle of pitch will decrease. The angle of spoilers deflection and the intensity of decrease in pitch will depend on the rate of speed increase. Reducing the thrust of the engines in this algorithm is not provided, since there is no need for this: in the GP, to protect against overspeeding, it is sufficient to release the interceptors. At an emergency reduction in an emergency situation, the engines are preliminarily transferred to the "MG" mode. In this case the spoilers and a decrease in pitch angle will be enough. The same concerns lowering the aircraft in the automatic mode. In case of exceeding the maximum speed, the autopilot will be simply turned off and the CDD protection algorithm will come into operation. According to TsAGI, the number of functions implemented in the CDS (approximately):

An-148 – 12, IL-96 – 15, Tu-204 – 25, RRJ-95 – 32 or 33

Approximately the same number of functions, around 30, is performed in the SDU V-787 and A-380

The ACS is a computer system applied in avionics and interacting with the aircraft and the engine control systems. The automatic flight control system (ACS) is designed to provide automatic and director control in the pitch and roll channels, as well as for automatic control of the engine thrust. ACS provides the following functions:

- automatic stabilization of the angles of roll, pitch and heading;
- automatic altitude stabilization;
- automatic stabilization of the travel angle specified with the PU;
- automatic stabilization of the course value set by the CP.

The control signals generated by the automatic control system are sent to the computer part of the CDS to be tested by the CDS drives.

In conclusion, I can state that the autopilot and full automation of the aircraft are the future of aviation. Though despite this rainbow picture, not a few accidents occur due to the fault of autopilots.

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## THE DIFFERENCE BETWEEN SATELLITE AND DRONE MONITORING

Agricultural production is very unstable throughout the world. This is especially noticeable because of global climate change, in countries with a predominance of

extensive methods of cultivating agricultural crops. For example, if you know how the spectral brightness of vegetation varies during the growing season, you can judge the agrotechnical state of fields by means of pictures' colors.

For analysis and informed decision-making, management needs operational data on the state of crops, as well as the analysis with high accuracy. Monitoring by unmanned aerial vehicles (UAV) and satellites provides remote monitoring of crops at key stages of plant growing (Table.1). The principle of action – the satellite flies over a given certain territory, takes high-resolution pictures, which fix necessary areas of fields. The obtained images are a source of operation information about the agrotechnical cultures and a special spectral camera allows us to calculate vegetative indices (NDVI, NDRI, RVI, etc.).

*Table 1  
The opportunities characteristics of satellite and drone*

Parameter	Satellite	Drone (UAV)
Accuracy	From 10m	From 2 cm
Risk factor	Cloundess	Weather, airports absence
Filters	Narrowband spectral band filters	Fixed wideband spectral band filters
Price	5-15 UAH/ha. (per season)	15-20 UAH/ha. (for flight)
Coverage per day	up to 2000 ha.	up to 3000 ha.

The cost of satellite monitoring remains more stable because it does not depend on the increasing the territorial sizes. While a price of using a drone of operation can been increase. Thus, the advantages of satellite monitoring are: low cost and the ability to perform long haul flights.

UAVs can work even in cloudy conditions, which are unsuitable satellites and it makes difficult to use aviation.

According to our previous comparing we have conclusion about final results of devises' work (Table 2).

*Table 2  
The difference between satellite and drone final picture*

Parameter	Satellite	Drone (UAV)
Map of crops by NDVI	+	+
Vector maps for heterogeneous zones	+	+
Report by crop	+	+
Orthophoto plan	+	+

Measurement of territories	+	+
Relief matrix	-	+
Accurate map of crops	-	+
Plant condition map	-	+
Real area	-	+
Relief exact contours of sites	-	+

Aerial photography with UAV is more detailed than the space picture. The resolution of the images is possible in centimeters per point, due to flight altitudes from 100 to 600 meters above the ground.

Reception pictures is possible even during the flight, and you can change the flight in real time, if the customer needs it.

The drones have great potential from the point of view of optimizing the agricultural production. One of the advantages of the drones it's their availability to users.

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## THE WORLD OF IT: TRENDS AND DEVELOPMENTS

Information Technology is an all-pervasive part of modern life. I am sure that in the nearer future all equipment we use in everyday life will be so automated, that when you come home you will take a cup of fresh coffee, that you have ordered your electric coffee machine by your smartphone when leaving the office; washing machine will set the washing regime by scanning labels on clothes; communal meters will form and pay for utilities with your cash card by themselves. IT-industry shows its explosion and its consequences effect the entire social system.

I want to show you my own predictions for trends and developments in the world of IT for the nearest years:

### **1. IT in household appliances.**

90% of all household appliances available will have built-in artificial intelligence, which will make housewives' and maintenance people's work easier.

### **2. Maximum energy saving**

All electrical appliances will contain an artificial intelligence with the function of energy saving.

### **3. Voice and visual search as the main search methods.**