

4. Problem-oriented languages are designed to implement large projects, increase their reliability and speed of creation. As a rule, they have built-in powerful operators, which allow one line to describe the functionality of the implementation. In comparison with them, the languages of the younger generations required thousands of lines of code.

5. Systems of automated creation of applications, including visual development tools (RAD-environments). They are characterized by the ability to automatically generate the resulting text in universal programming languages (Delphi, Borland C, MS Visual Studio, etc.).

Nowadays, the number of programming languages is measured in thousands and continues to grow.

### ***References:***

1. David Swersky. Top 43 Programming Languages: When and How to Use Them [Electronic resource]. – Access mode: <https://raygun.com/blog/programming-languages>.
2. What is a Programming Language [Electronic resource]. – Access mode: <https://www.computerhope.com/jargon/p/proglang.htm>.
3. Programming languages [Electronic resource]. – Access mode: [https://en.wikipedia.org/wiki/Programming\\_language](https://en.wikipedia.org/wiki/Programming_language).

### **Davyd Polyarush**

Research supervisor: Mykhailo Kasianchuk

Candidate of Sciences in Physics and Mathematics, Associate Professor

Language tutor: Lilia Shtokhman,

Candidate of Philological Sciences, Associate Professor

Ternopil National Economic University

## **HOW DOES TESLA AUTOPILOT WORK**

Nowadays, you can believe in miracles just by looking at new technologies. The new automobile Tesla became one of them. The company was founded in 2003 by a group of engineers who wanted to prove that people did not need to compromise to drive electric – that electric vehicles can be better, quicker and more fun to drive than gasoline cars [2].

So, the aim of our work is to present Tesla autopilot safety features.

Combining safety, performance, and efficiency, Tesla cars reset the world's expectations for the car of the 21st century with the longest range of any electric vehicle, over-the-air software updates that make them better

over time. It's been shown time and time again to help people avoid accidents. In fact, Tesla CEO Elon Musk said that the Autopilot can help reduce accidents by as much as 50% [1].

Autopilot is an advanced driver assistance system that improves safety and driving comfort. When used correctly, Autopilot reduces your overall load as a driver.

Tesla's Autopilot system is made up of multiple sensors placed all around the car. These sensors help the car understand its environment so that it can safely steer itself in most highway situations. The hardware that makes up Tesla's self-driving system includes a forward-looking radar, a forward-looking camera, a high-precision digitally-controlled electric assist braking system, and 12 long-range ultrasonic sensors placed around the car. These ultrasonic sensors are strategically placed around the car so that they can sense 16 feet around the car in every direction and at any speed.

This includes access to Autopilot features that enable your car to steer, accelerate and brake for you within almost any lane. It will also automatically change lanes on most highways to overtake other cars or navigate to interchanges and exits.

The sensors enable the vehicle to sense when something is too close and gauge the appropriate distance so that it can do things like safely change lanes. However, it should be noted that these sensors can be thrown off by things like debris covering them. The forward-facing camera is located on the top windshield. A computer inside the camera helps the car understand what obstacles are ahead of the car. The camera is basically the system's eyes. It enables the car to detect traffic, pedestrians, road signs, lane markings, and anything else that might be in front of the vehicle. This information is then used to help the car drive itself. While Autopilot is activated, the car is capable of steering within a lane, changing lanes, managing the speed of the car, and controlling braking while driving on the highway [2].

But just like any system, it's not perfect. And it requires a human to pay attention at all times.

So, as we may conclude, electric cars, batteries, and renewable energy generation and storage already exist independently, but when combined, they become even more powerful. And the future with life-saving technologies like the Tesla autopilot is the future we want.

### ***References:***

1. Autopilot trial [Electronic resource]. – Access mode: <https://www.tesla.com/support/autopilot-trial#how-does-it-work>
2. How Tesla's autopilot works [Electronic resource]. – Access mode: <https://www.businessinsider.com/how-teslas-autopilot-works-2016-7#teslas-autopilot-system-is-also-constantly-learning-from-other-cars-in-the-tesla-fleet-and-improving-9>

### **Romaniv Orest**

Research supervisor: Mykhailo Kasianchuk

Candidate of Sciences in Physics and Mathematics, Associate Professor

Language tutor: Lilia Shtokhman,

Candidate of Philological Sciences, Associate Professor

Ternopil National Economical University

### **3D PRINTING**

3D printing or additive manufacturing is a process of making three dimensional solid objects from a digital file. The 3D printing industry encompasses many forms of technologies and materials. When most people think of 3D printing they visualize a simple desktop 3D printer but that is just the tip of the iceberg. 3D printing can be divided into metal, fabrics, bio and a whole host of other industries. For this reason, it is important to see it as a cluster of diverse industries with a myriad of different applications [1].

So, the aim of our research is to present the perspective of using 3d printing technology in different industries.

Additive manufacturing invaded the food industry a long time ago. Restaurants like Food Ink and Melisse use this as a unique selling point to attract customers from around the world.

3D Printing is allowing for odd kinds of food to come about. Shape shifting pasta could be available at a store near you any time soon [1].

Car manufacturers, restorers and repairers have been utilizing 3D printing for a long time. Automotive industry experts only expect the use of additive manufacturing technologies to grow in the coming years. Companies are using it to produce not just parts, but tools, jigs and fixtures. It has also enabled on-demand manufacturing, leading to lower stock levels for spare parts [1].