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МАТЕРІАЛИ

XIV ВСЕУКРАЇНСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ СТУДЕНТІВ, АСПІРАНТІВ ТА ВИКЛАДАЧІВ ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ КАФЕДРИ ІНОЗЕМНИХ МОВ

«TO MAKE THE WORLD SMARTER AND SAFER»

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People react to static and movement things in different ways. Movement helps perception of “alive’ and “sentient” but moving creatures can also give us the creeps.

Now, there’s debate around which mechanisms are behind our uneasiness around human-looking-but-not-fully-there robots. These are the top contenders:

- Mate selection
- Mortality salience
- Pathogen avoidance
- Violation of human norms
- Religious definition of human identity
- Conflicting perceptual cues
- Threat to humans’ distinctiveness and identity

But how can we avoid this phenomenon? First, we need to understand which types of robot we need: industrial or robots which can help people in everyday works. Then we need to create them, but we need to understand that every robot is only a machine, not a real person and they are only simulate feelings and human behavior.

But this problem will be more actual in our future not present.

WEIGHTLESS TRANSPORTATION OF THE FUTURE

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English science fiction writer Arthur Clark made another prophecy. "... Maybe, we are on the verge of creating a new type of spacecraft that can leave Earth at minimal cost by overcoming the gravitational barrier," he said. "Then the current rockets will be the same as the balloons before the First World War." What is the basis for such statement? The answer can be found in the modern ideas of creating a transport on magnetic cushion.

The disadvantages of traditional modes of transport (noise, vibration, environmental pollution, increased fuel consumptionб traffic congestion, etc.) can be largely eliminated during operating intensively developed magnetic suspension trains. The feature of this trains are: wagons have no wheels, they do not have traditional traction motions and current elements. The main advantage of magnetic suspension is reduction of basic resistance to motion of train. Mass of trains on magnetic suspension at the same capacity about half the weight of a simple electric train accordingly, the power of the actuator and the energy consumption are twice smaller.

Half a century ago, a magnetic cushion was a fantasy. However, nowadays scientists in many countries are working to create a transport on magnetic suspension. The trains of future will "soar" above the ground, they seem to be "suspended" from the rails, or repelled by them, depending on which system will be used: electromagnetic suspension or electrodynamic suspension. In the first case, way is steel rails with a crew suspended from them. In the second case, the crew will go on a metal canvas which produces electric currents . Linear induction motors will be used as a traction mechanism in such trains. It should be noted that magnetic suspension started operating in the 1980s in Birmingham. However, after eleven years of operation, this train was taken off the line due to technical problems. Nowadays, transport system on magnetic cushion operates in China, connecting the center of Shanghai to Pudong International Airport. In Japan, the experimental train on the magnetic cushion MLX01 in 2003 this mode of transport set a speed record that reached 581 km / h.

The two fundamentally different methods on magnetic suspension are exploring now: electromagnetic (using gravity) and electrodynamic (using repulsive forces). In the first case, use a linear induction motor, conventional "heat" magnets with acceptable energy consumption, mass dimensions and thermal equipment. However, due to the small track gap (10-20 mm), there are a number of difficulties associated with providing increased rigidity of suspension and lateral stabilization, complication of flight crew equipment. With electrodynamic suspension, a large travel gap (up to 250 mm or more) can be achieved with superconducting magnets. To create traction, they use a synchronous linear motor operating on the principle of interaction of a moving magnetic field created by the track winding and a constant field of excitation created by magnets mounted in the wagons.

Maglev or Magnetoplane is a magnetic suspension train that is driven and controlled by magnetic forces. Such a train, unlike traditional trains, does not touch the surface of the rail during the movement. Since there is a gap between the train and the surface of the movement, friction is eliminated and the only brake force is the aerodynamic drag force.

Reached speeds is comparable to airplane speeds can compete with air travel over short distances (up to 1000 km). Although the idea of such transportation is not new, economic and technical constraints have not allowed it to be fully developed, so the technology has only been introduced several times for public. Currently, maglev cannot use the existing transport infrastructure, although there are projects with the arrangement of elements of a magnetic road between the rails of a conventional railway or under the lane of a highway.

Currently, there are three main technologies of magnetic suspension of trains:

- on superconducting magnets (electrodynamic suspension, EDS);

Superconducting magnet - solenoid or coil solenoid made of superconducting material. The superconducting winding has zero ohmic resistance. If such a winding is short-circuited, then the electric current stored in it is stored for almost any length of time.

The magnetic field of a non-quenching current circulating along the winding of a superconducting magnet is exceptionally stable and free from ripple, which is important for a number of applications in scientific research and technology. The superconducting magnet winding loses its superconductivity property when the temperature rises above the critical temperature $T_к$ of the superconductor, upon reaching the critical current $I_к$ or the critical magnetic field $H_{к.}$ With this in mind, for superconducting magnet windings. use materials with high values of $T_к$, $I_к$ and $H_к$.

- On electromagnets (electromagnetic suspension, EMS);
- On permanent magnets; it is a new and potentially most economical system.

The crew levitates by repelling the same poles of magnets and, conversely, attracting different poles. Movement is carried out by a linear engine, located either on a train or on a track, or both there and there.

Linear motor - an electric motor in which one of the elements of the magnetic system is open and has a winding, creates a moving magnetic field, and another made in the form of a guide, provides a linear movement of the moving part of the engine. Many linear engine designs are currently being developed, but all of them can be divided into two categories - low acceleration motors and high acceleration motors. Low acceleration engines are used in public transport (Maglev, Monorail, Subway). High-acceleration motors are very small in length and are typically used to accelerate an object to high speed and then release it. They are often used to investigate hyper-speed collisions, such as weapons or launchers of spacecraft. Linear motors are also widely used in wire feeders and in robotics. A major problem with designing is the large weight of sufficiently powerful magnets, since a strong magnetic field is required to maintain massive composition in the air.

Advantages include the highest speeds available on serial (non-sport) land transport and low noise. The disadvantages are the high cost of creating and maintaining a track, the weight of magnets, and the consumption of electricity.

The most important drawback of MAGLEV trains is the peculiarity of electromagnets, which provide levitation of wagons over the canvas. Non-superconducting electromagnets consume huge amounts of energy. Using the same superconductors in the canvas, the cost of cooling them will negate all the economic benefits and the ability to implement the project.

A magnetic field created by a magnetic suspension can be harmful to road crews and surrounding residents. Even traction transformers, which are used on electrified AC railways, are detrimental to machinists, but in this case the field strength is an order of magnitude greater. It is necessary to control the gap between the road and the train (several centimeters) at high speed (hundreds of km / h). This requires extremely fast operating systems. Requires complex travel infrastructure. For example, an arrow for a maglev represents two sections of the road, which change each other depending on the direction of turn. Therefore, it is unlikely that maglev lines will form branching networks with forks and intersections.

However, despite all the complexities, the prospects of using magnetic cushioning remain quite attractive. Thus, the Japanese government is preparing to resume work on a fundamentally new type of land transport - magnetic cushion trains. According to engineers, "Maglev" cars are able to cover the distance between the two largest populated centers in Japan - Tokyo and Osaka - in just 1 hour. The current high-speed rail express takes 2.5 times longer to do this.

Not only the Japanese are engaged in magnetic cushion transport. In Germany, for a number of years, there have been their own studies on this subject, and the Germans have abandoned the idea of laying a "maglev" line between Berlin and Hamburg because of the excessive cost of the project. And in China, by contrast, there are now seriously open possibilities to include the "foggy" construction between Beijing and Shanghai in a 10-year state development plan. The Shanghai authorities have more to improve the world's only commercial magnetic rail service since that time to quickly travel between the city's two international airports. At present, trains running at a maximum speed of 430 km / h run from Pudong Airport to the banking center. It is now planned to connect both international airports in opposite suburbs, allowing passengers to travel from one to another in just 15 minutes.

Many designs and projects are already 20-30 years old. And the main task for their creators is to attract investors. The problem of transportation itself is quite significant, because often we buy some products so expensive because a lot of money is spent on transporting them. The second problem is ecology, the third is high traffic congestion, which is increasing year by year, and for some types of transport by tens of percent.

As a promising direction for the development of transport on a magnetic cushion, both in terms of ecology and in terms of economic efficiency is convenient, transport on permanent magnets will improve these indicators.

Analyzing the ideas of engineers and scientists about levitating cars, we found no options for using inductors as engines for such a car. That's why they came up with the idea of creating a hybrid car on a magnetic cushion, with the crossing of the MAGLEV roadbed and the battery and inverters of the TESLA electric car.

VIRTUAL AND AUGMENTED REALITY

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What is virtual and augmented reality? First of all, for a better understating what these two terms mean let me give you a definition.

Virtual reality – is a simulated experience that can even be out of this world. When augmented reality is some addons to your life. Examples of virtual reality would be you with the help of technology to go out of this world (basically it has no effect on your real life). Examples of augmented reality can be some devices that would give you the opportunity to effect things in the real world.