



Project № 130

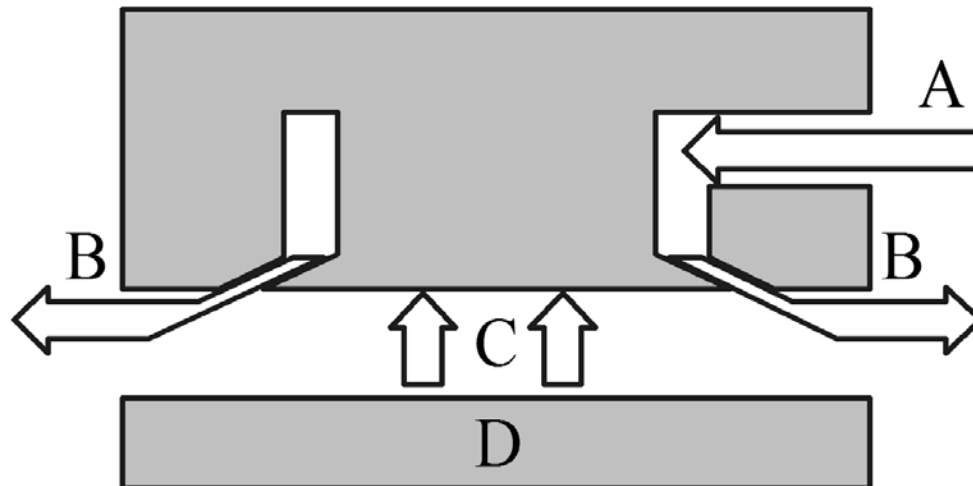
Energy-Efficient Non-Contact Bernoulli Gripping Devices for Industrial Robots



Speaker Roman Mykhailyshyn

Project idea

The main idea of the project is to optimize the design of the active surface and nozzle elements of Bernoulli grippers and the dispersion of their areas of interaction with the surface of the object of manipulation, which will increase load capacity, stability of cargo and reduce energy costs.



Principle of Bernoulli gripping device action :

A – compressed air, B – air flow, C – lifting capacity, D – object

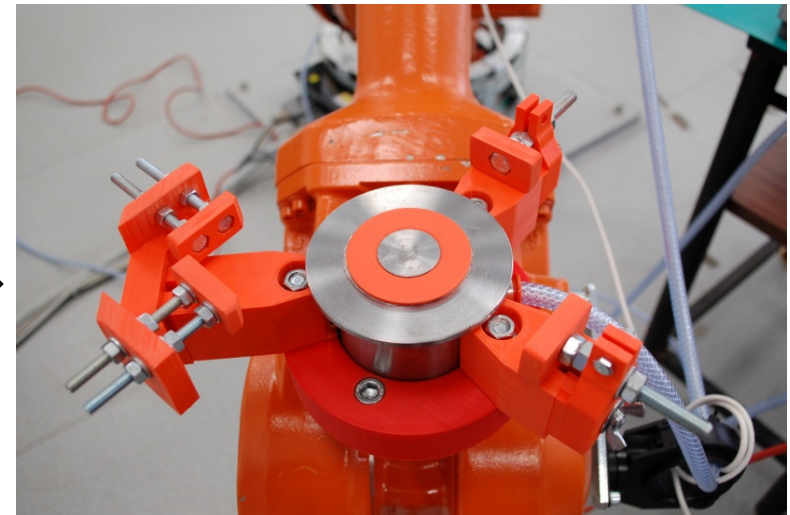
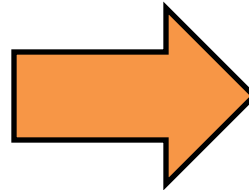
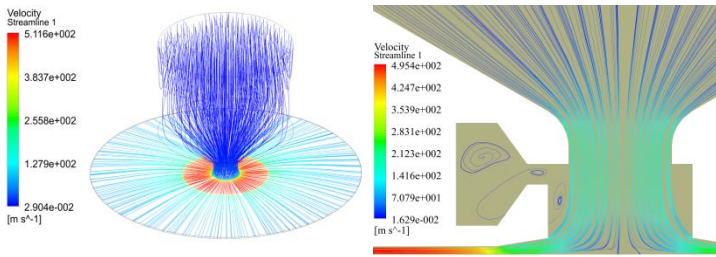
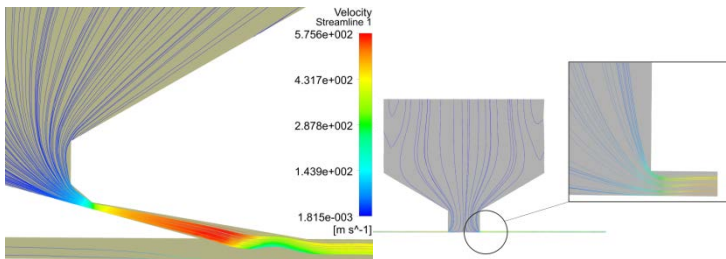
Problem description

In the technological processes of various industries to perform operations of loading products into technological equipment, the use of contactless gripping devices is promising. However, the energy efficiency of such capture systems is very low. In particular, it is often observed that the energy consumption for the performance of industrial movements is less than for the maintenance of objects by the capture system.

Therefore, the use of rational designs is an important issue for enterprises and manufacturers of these systems.

Decision

The solution is the developed energy-efficient designs of contact and non-contact Bernoulli gripping devices of industrial robots. Using the proposed designs of energy-efficient Bernoulli gripping devices, will minimize energy costs in production for contact or contactless retention of goods up to 30%.

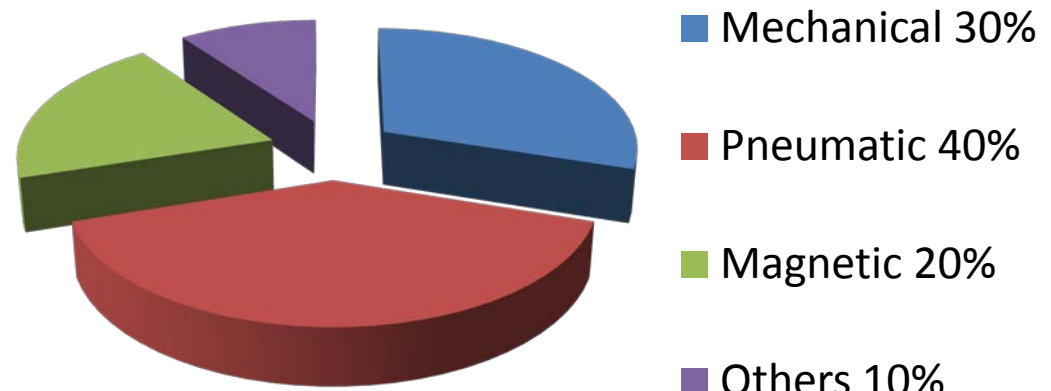


Market

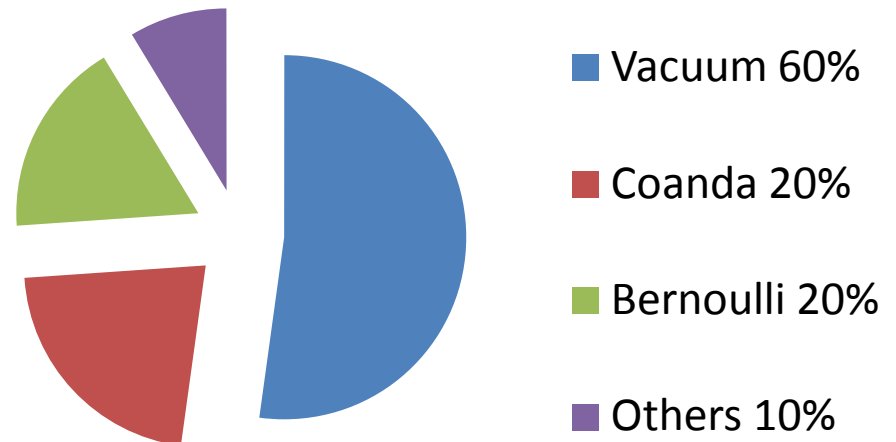
According to the International Federation of Robotics, the average annual growth rate of industrial robots in production is 14%, of which 50% is accounted for by loading and unloading operations.

Bernoulli grippers account for **20%** of all pneumatic grippers used in industry.

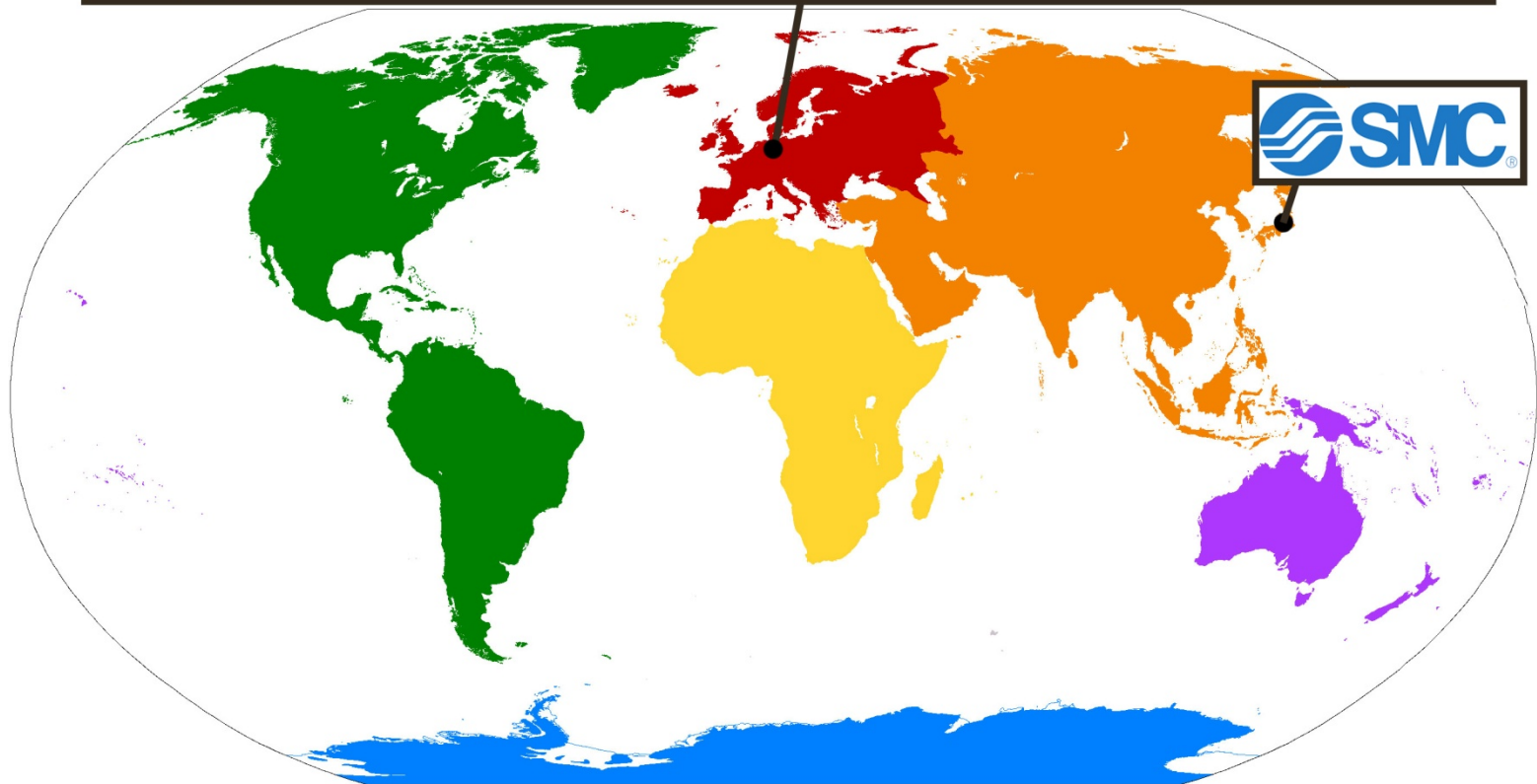
Grippers in the market



Pneumatic



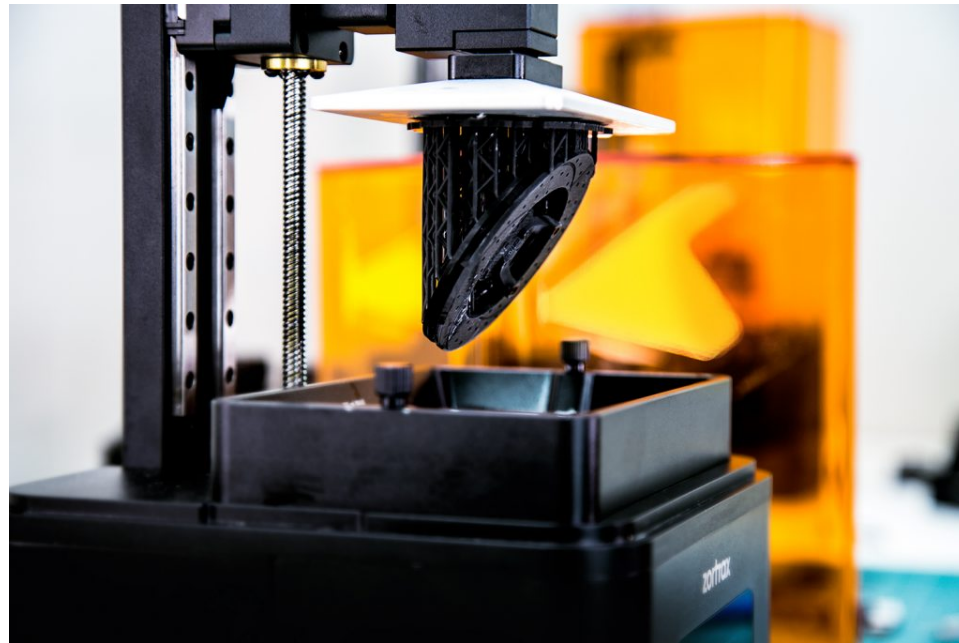
Concurrent



Concurrent companies have a network of offices in all countries of the world, but they can become consumers of the technologies they offer.

Financial indicators

The price of one gripper varies depending on the size and firm and makes 200-1000 euro.



For production it is possible to use high-quality photopolymer 3D printing, which will reduce the cost of production and increase the profitability of production. However, in this case, the production time increases significantly, which is effective only for small batches.

Current situation

At this stage, a prototype was made and several patents of Ukraine were obtained.

Currently, research is being conducted on the performance of the prototype, including abroad.



Project team

Mykhailyshyn Roman

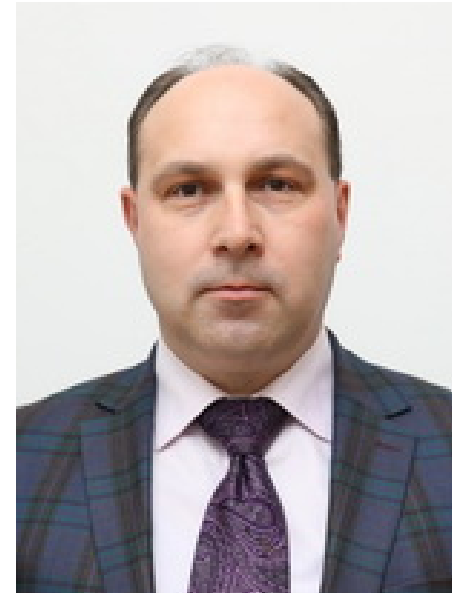


Project manager,

Solution development.

Associate Professor of the
Department of Automation of
Technological Processes and
Manufacturing of TNTU

Savkiv Volodymyr



Solution development.

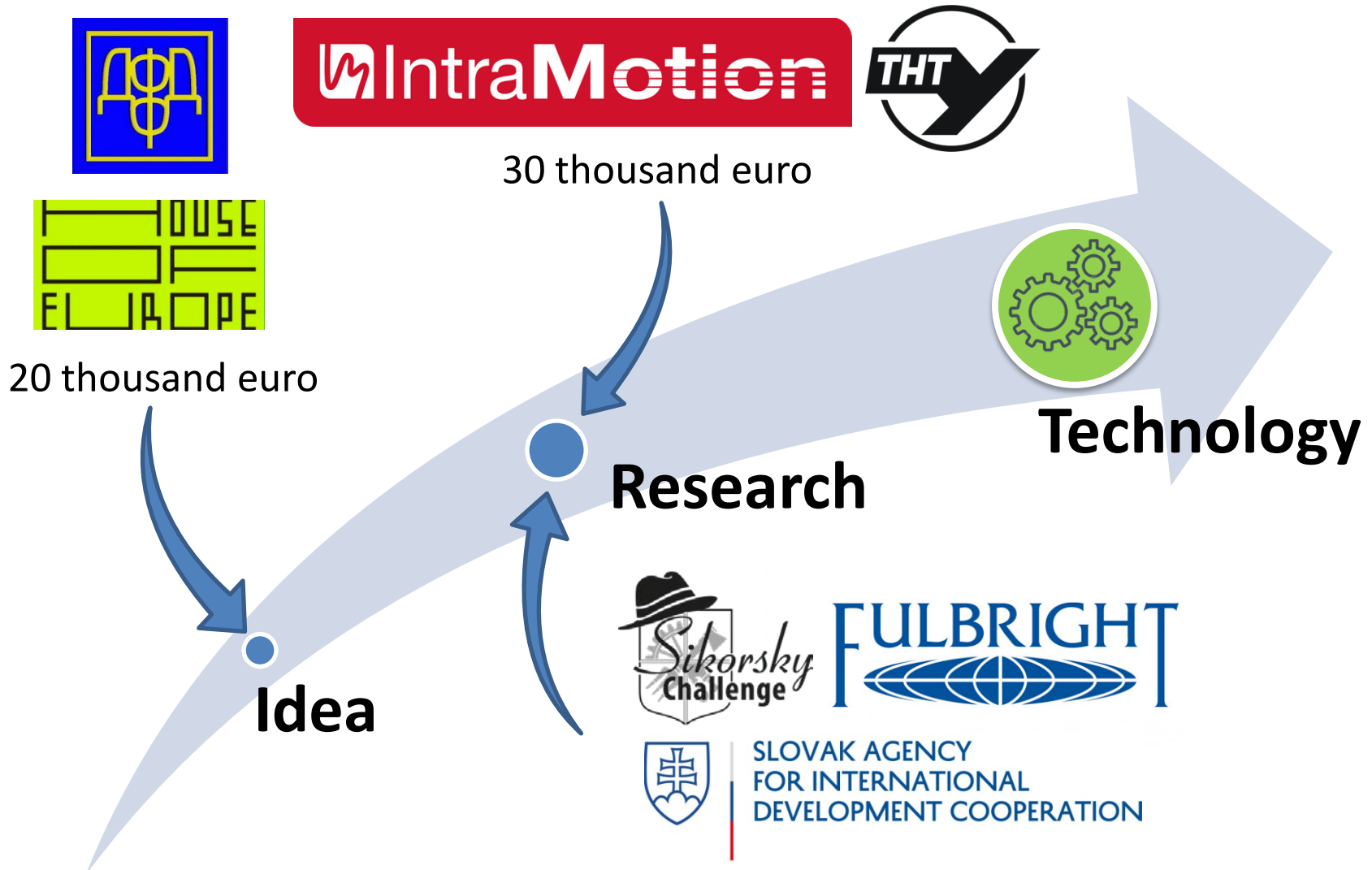
Head of the Department of
Automation of Technological
Processes and Productions of TNTU

Project team

The team is actively developing and cooperating with foreign colleagues in the field of robotics and innovation.



Suggestions



Being an investor, partner or integrator is up to you!