

## ПОДСЕКЦИЯ АНГЛИЙСКОГО ЯЗЫКА

### DYNAMIC SHAPE DISPLAY

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The principle of operating dynamic shape display is considered in this paper.

Have you ever thought about visualizing your project or holding online conferences with physical interaction, or a table that automatically adjusts to each object? If the answer is «NO», then the purpose of this paper will be to review the invention, which unites all these questions.

Dynamic shape display is a project created by two PhD students, Daniel Leithinger and Sean Follmer, of the Massachusetts Institute of Technology in 2013. This project is called inFORM. InFORM represents a table built with motors, linkages and pins, that can render a person physically in real-time via a digital source (Figure 1).

This device is something like a pinscreen, with each pin attached to an individual motor. That's 900 pins, each a half-inch wide, with 900 separate motors. These motors are commonly used on audio mixing boards and power faders. But these motors are pretty weak, therefore they use linkages—long cables that reduce friction. Each motor is then controlled by a custom circuit board with a microcontroller, which is then connected to a computer. The most complex feat the inFORM can accomplish is rendering a person or an object remotely. For this, the team uses a standard Xbox Kinect, a sensor is typically used for motion-intensive gaming to capture a person's movement. And a mounted projector also displays colour (Figure 2).

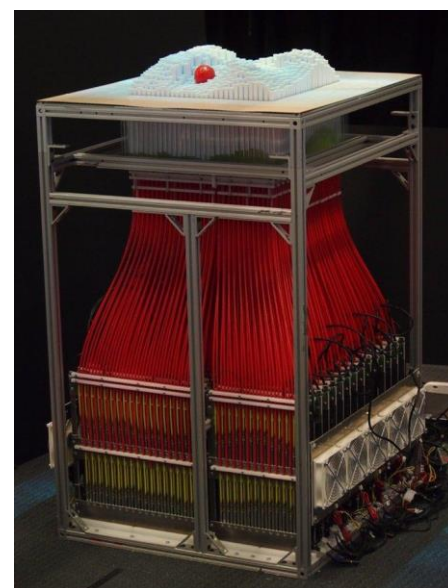


Figure 1. Dynamic shape display

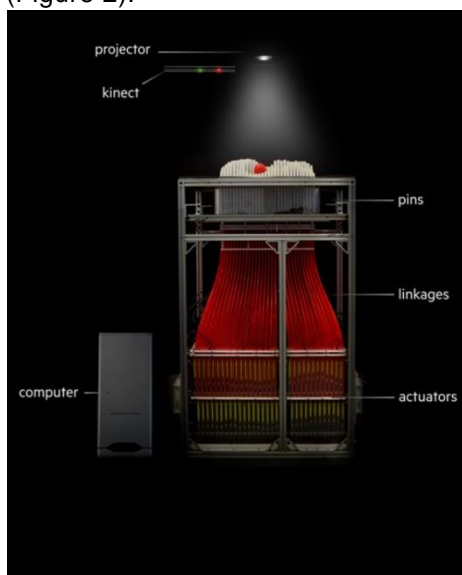


Figure 2. Scheme of the inFORM

Also, inFORM makes it possible to display three new types of physical telepresences, such as:

- Asymmetric teleoperation;
- Bi-directional interaction through shape capture;
- Bi-directional interaction through deformation.

This invention can help in many spheres of life. For example, urban planners and architects would be able to view 3D models in real-time to better understand the design prototypes. In the medical industry, inFORM can be used to visualize cross section through volumetric data such as CT scans, which could view in three dimension allowing doctors and surgeons to physically analyze information. Also remote participants in video conferences can be displayed physically. In conclusion, inFORM is invention, which may be useful in different spheres of our life: beginning with smart table and finishing in 3D CT scans.

#### References:

1. <https://www.youtube.com/watch?v=ICARHatJQJA>
2. <https://www.popularmechanics.com/technology/design/a9847/how-mits-inform-dynamicdisplay-works-16222829/>
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