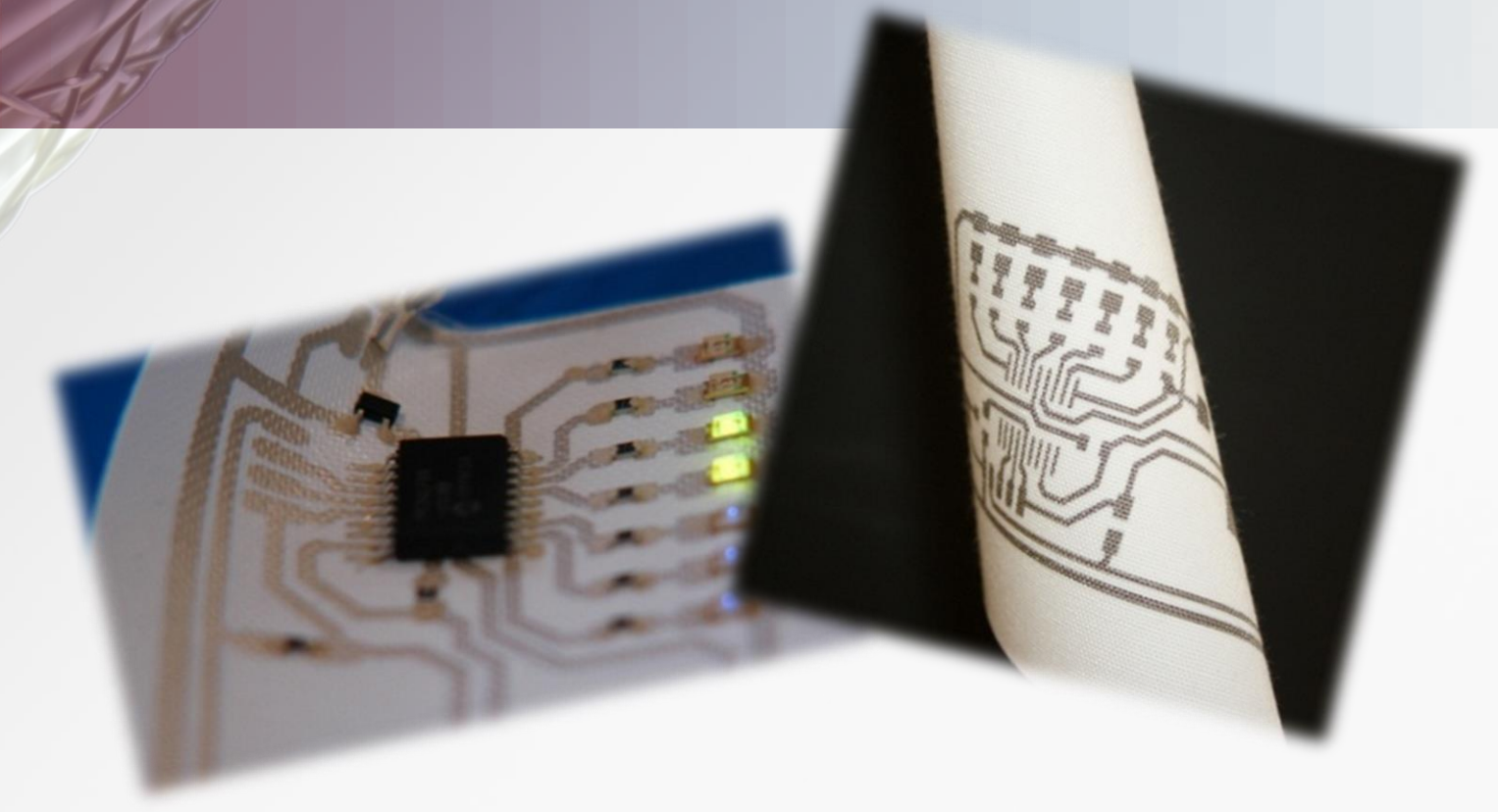# Textronics
Evolution of intelligent textiles

- **New field of knowledge emerging from sciences like electronics, textile manufacture, automatics, metrology and informatics**
- **Applied in research processes in many sectors such as textiles, medicine and health, construction, automotive and power industry.**

Textornics - the new field for innovations

In eight decade of XX century intensive research on intelligent materials and electro-conducting textiles have begun. The goal was to connect this innovative materials with many other textiles, simultaneously equipping them with simple electronic devices.
Precursors of wearable electronics were research teams from Massachusetts Institute of Technology (MIT), Media Laboratory and Phillips Laboratory of Design. Together, they disseminated ideas of adding portable electronic devices into the clothing, in aim to widen its basic function, at the same time increasing comfort, safety and consumer satisfaction.

Modern textronic products have numerous characteristics:
- [ ] multifunctionallity – ability of executing different tasks within the limits of one system
- [ ] „parameters intelligence" – capability of autonomous reactions on external factors changes
- [ ] advanced technology of production
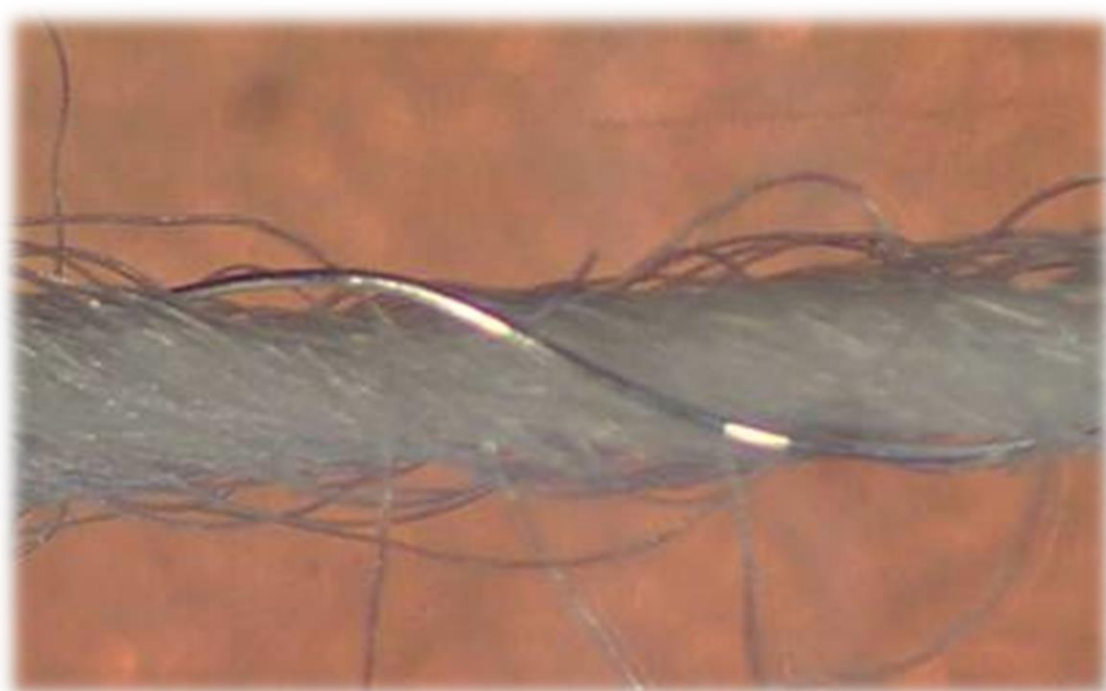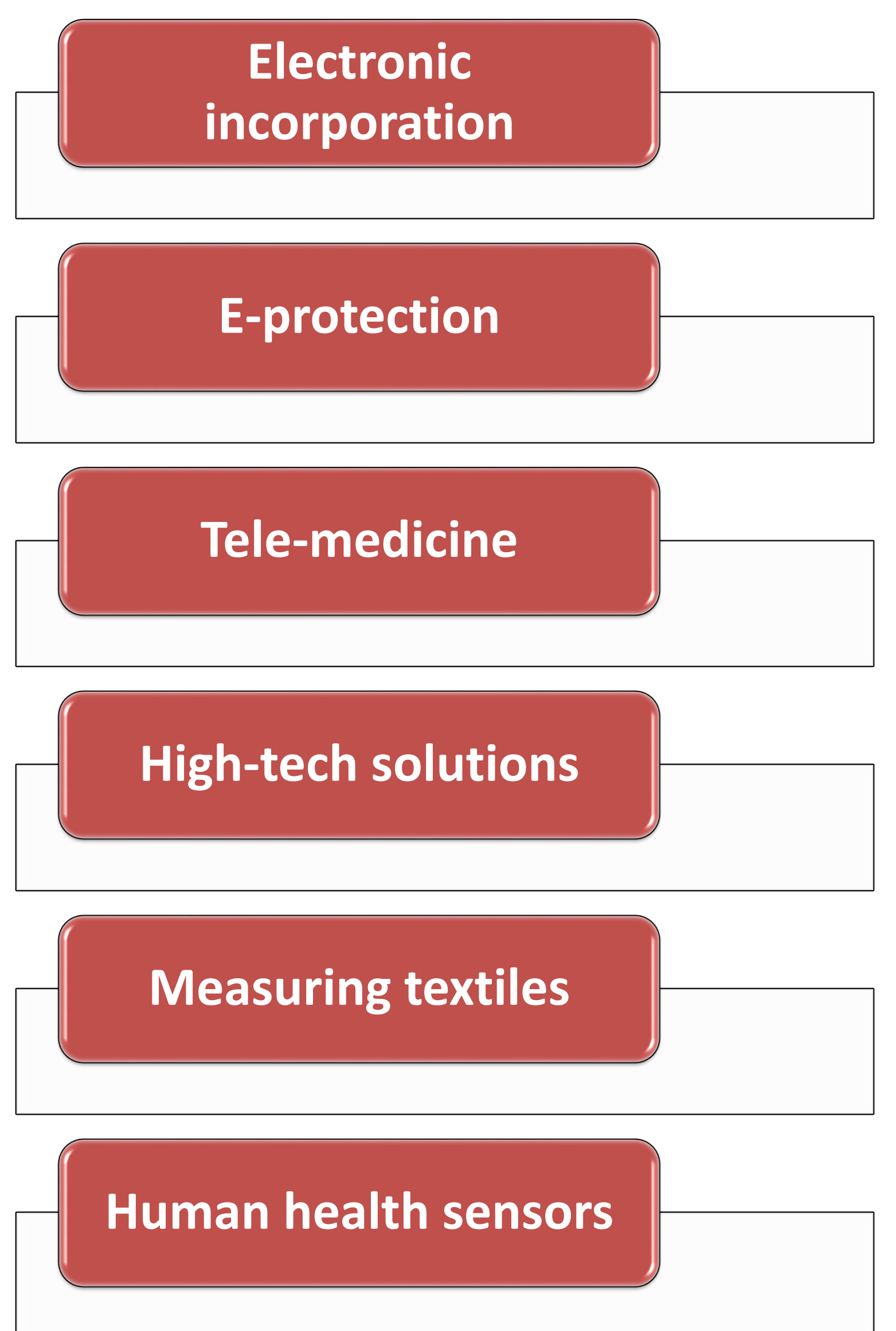- [ ] elasticity of available products blueprints modifications, on stage from projecting to exploitation

The Textronics Laboratory

Laboratory conducts interdisciplinary research projects combining textile manufacture (including construction of textiles and knitwear) with new applications for electronic devices. Developed textronic products integrate miniaturized electronics and special electronic systems with textile material in one, functional unity.
Laboratory takes part both in industry research and development works on applying printed electronics and optoelectronic solutions, as well as on joining different linear structures with conductive and resistive potential with elastic materials such as textiles and knitwear. It utilizes to achieve this goal methods like screen printing technology, laser plotter, machine embroidery and rotogravure.

Areas of application:
- [ ] semiconductors microelectronics
- [ ] printing of hybrid and thinlayer systems
- [ ] possibility of printing joints and SMT/TH printed micro-assemblies
- [ ] development of printed photovoltaic elements
- [ ] incorporation of conductive, resistive and LED threads

| Electronic incorporation |
| E-protection |
| Tele-medicine |
| High-tech solutions |
| Measuring textiles |
| Human health sensors |

Conductive yarn

Examples of textronics elements, created with prinitng, embroidery and LED technologies
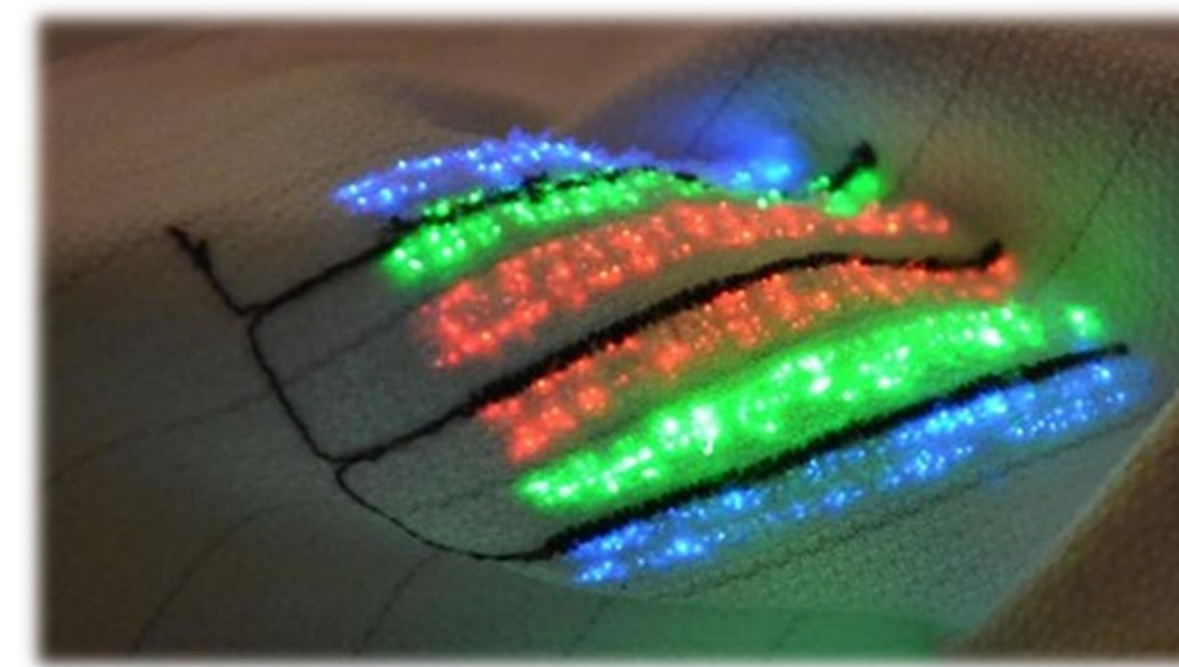
Solar bag

3D Videomicroscope

Digital 3D videomicroscope is integrated with micro- and macroscopic nondestructive inspection system. Magnification from 0.1x up to 10.000x, with 360° object rotation (3D).

Software of the device allows to:
- [ ] 2D measuring with statistics
- [ ] 3D measuring with auto multifocus function

The device enables of measuring diameter, length, angles, radius and roughness of the surface.

The 3D videomicroscope is used for basic and developmental reserach, in field of textile materials identification, deposited and imprinted electronic and photovoltaic elements, as well as analysis of surface and structure of other tested materials in the form of biomass, biosludge, vitrificate or ash.
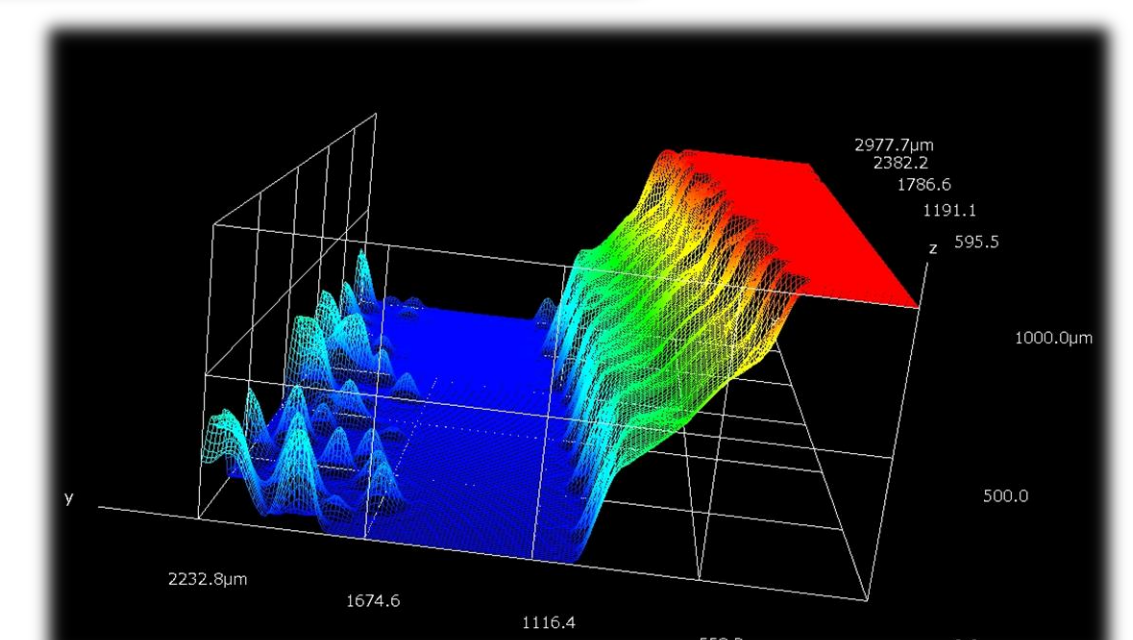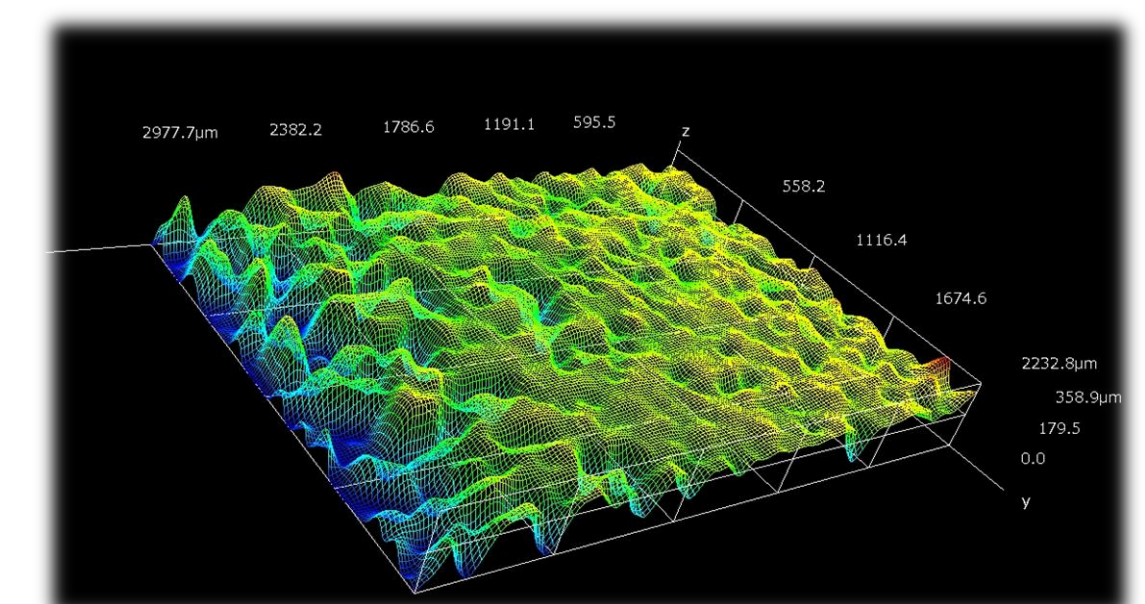
3D Printer

This advanced device controlled numerically, constructs objects from 3D printing materials of different chemical characteristics and compositions, and of any shape and application.

It helps to create and process 3D designs and models.

3D printer allows to project the prototypes of elements and products with different purpose in engineering, textronics, medicine, automatics or bioprocess solutions.

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