



Felfedezések nyomában

A „Tudomány Ünnepe 2012” rendezvénysorozat keretében
Tudomány napja a Gábor Dénes Főiskolán, 2012. november 14.

A 3D vizualizálás ipari alkalmazása

Kopácsi Sándor

kopacsi@gdf.hu, kopacsi@sztaki.hu

GDF, MTA SZTAKI

In the track of 3D inventions

- *first 3D viewer - Stereoscope (1840)*
- *first 3D camera - Kinematoscope (1855)*
- *first 3D movie - Power of love (1922)*
- *first 3D Plasma TV - Panasonic (2010)*
- *first 3D LED TV - Samsung (2010)*
- *first 3D Laptop - Sony (2010)*
- *first 3D Camcorder- Panasonic (2010)*



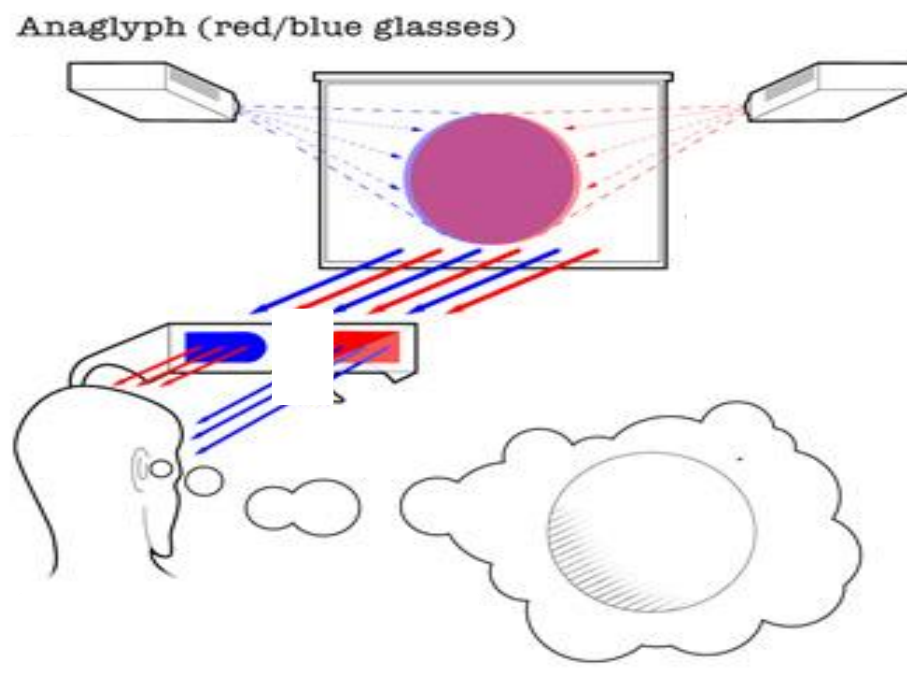
3D Visualization techniques

- *image preparation:*

- *Two offset images for the*
- *Left and Right eyes*

- *applied techniques:*

- *passive (e.g. anaglyph)*
- *active (e.g. shutter glass)*



3D Visualization in the new Robot Lab of MTA SZTAKI

Hardware: Fanuc S 430i F

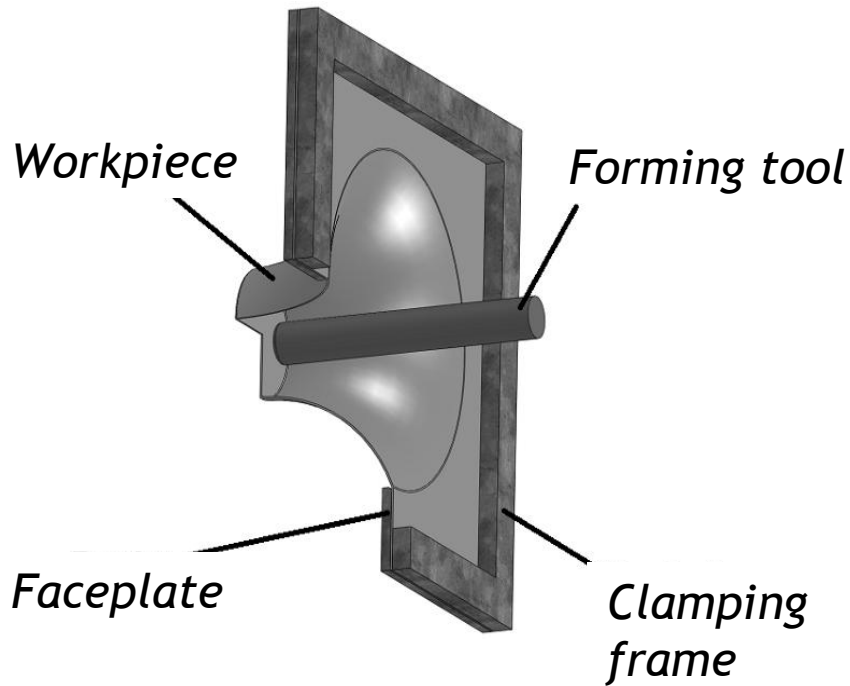
- *6 degrees of freedom*
- *able to lift up 130 kg*
- *2.5 meters horizontal reach*

Main applications:

- *Incremental Sheet Forming*
- *Solving the Rubik's Cube*
- *(Multifunctional furniture)*



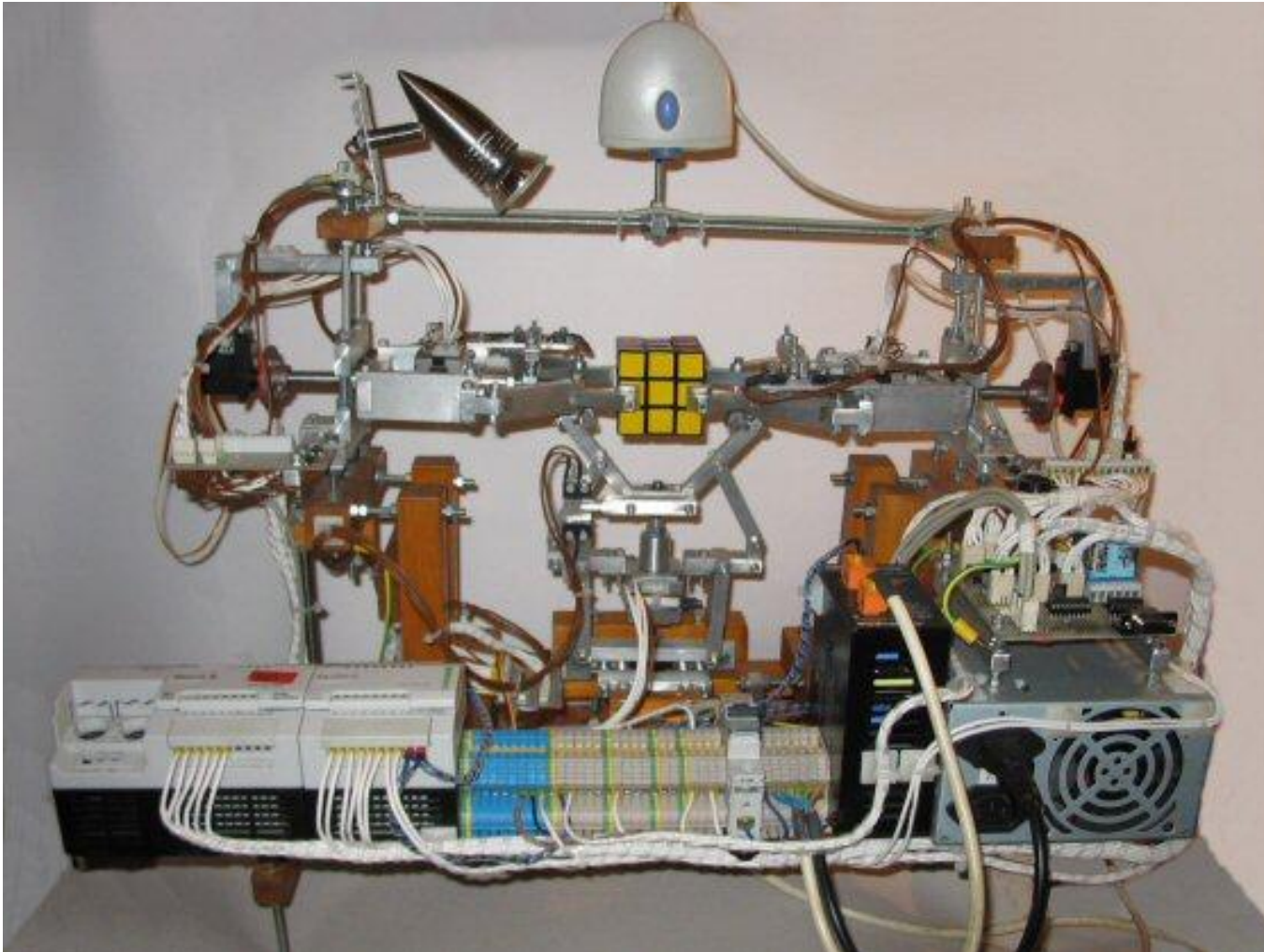
Incremental Sheet Forming



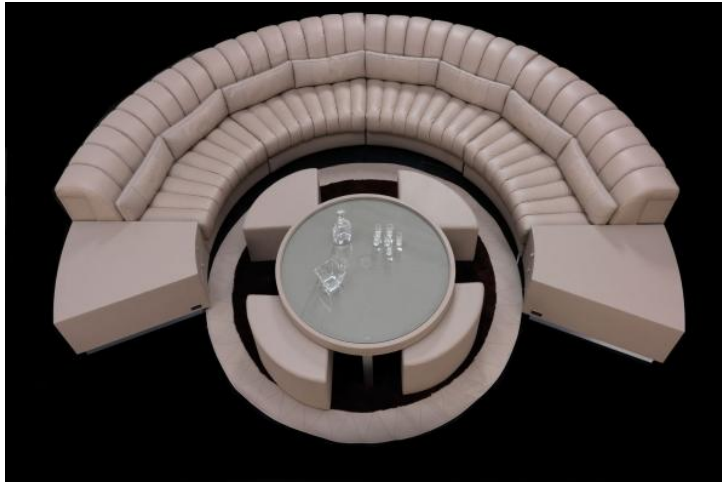
- *New manufacturing technology*
- *Flexible sheet forming based on series of small localized deformations*
- *Follows a tool path*
- *One of a kind production*
- *Metal, plastic*



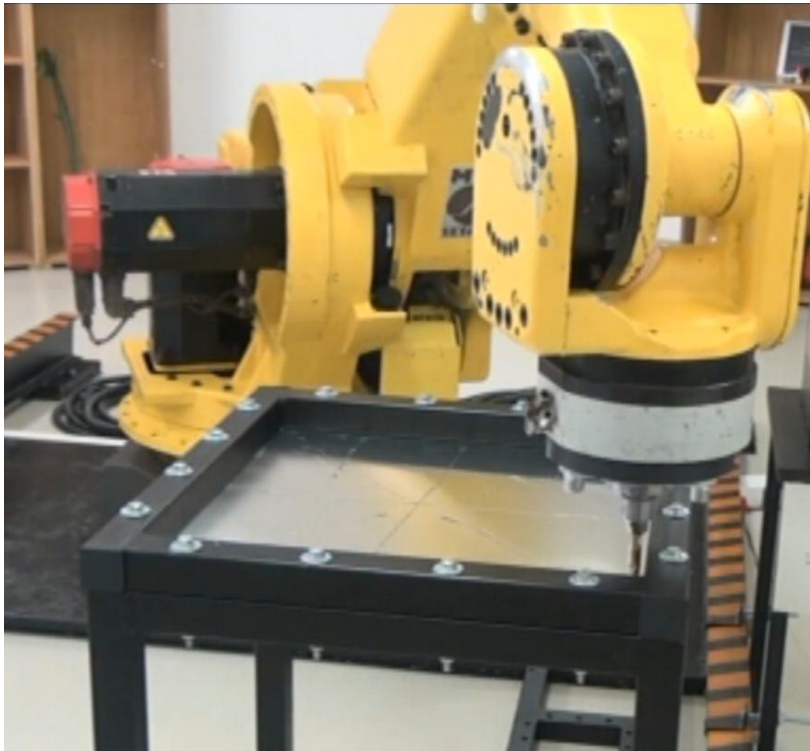
Rubik Robot



Art of Home



The real operations



Incremental Sheet Forming



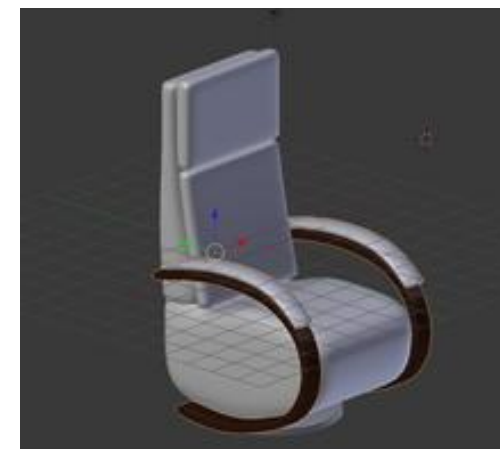
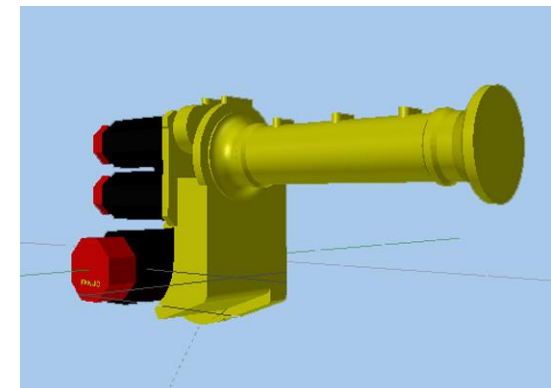
Solving the Rubik's Cube

Applied SW and HW tools

- *Software*
 - *Google SketchUp, Blender*
 - *Solid Works, Solid Edge, 3DS Max*
 - *VirCA*
- *Hardware*
 - *DELL XPS 3D laptop*
 - *Samsung D8000 SMART 3D Full HD LED TV*
 - *3D Cave*

Visual representation of the components

- *each movable part is an individual component*
- *some components were available in IGES format created in SolidWorks or Solid Edge*
- *other components was created in Google Sketchup or in Blender*
- *in some cases file conversions (IGES to 3DS) was performed by Autodesk 3ds Max*
- *All files were converted to Ogre format*



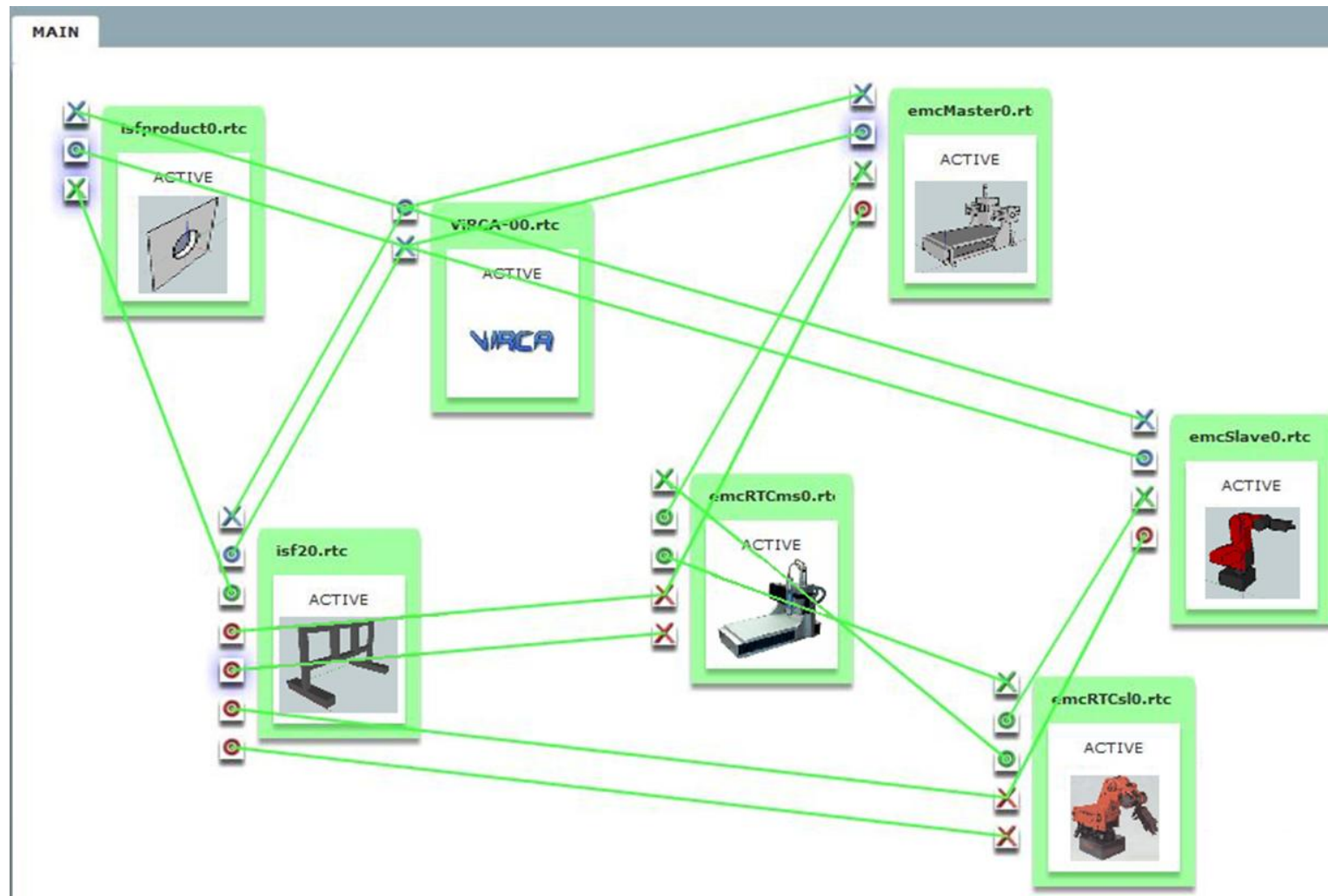
Virtual Collaboration Arena

- *modular, interactive, virtual environment*
- *for collaborative manipulation of robots and other hardware or software equipment*
- *that can be spatially and/or logically distributed*
- *and connected together via IP network*

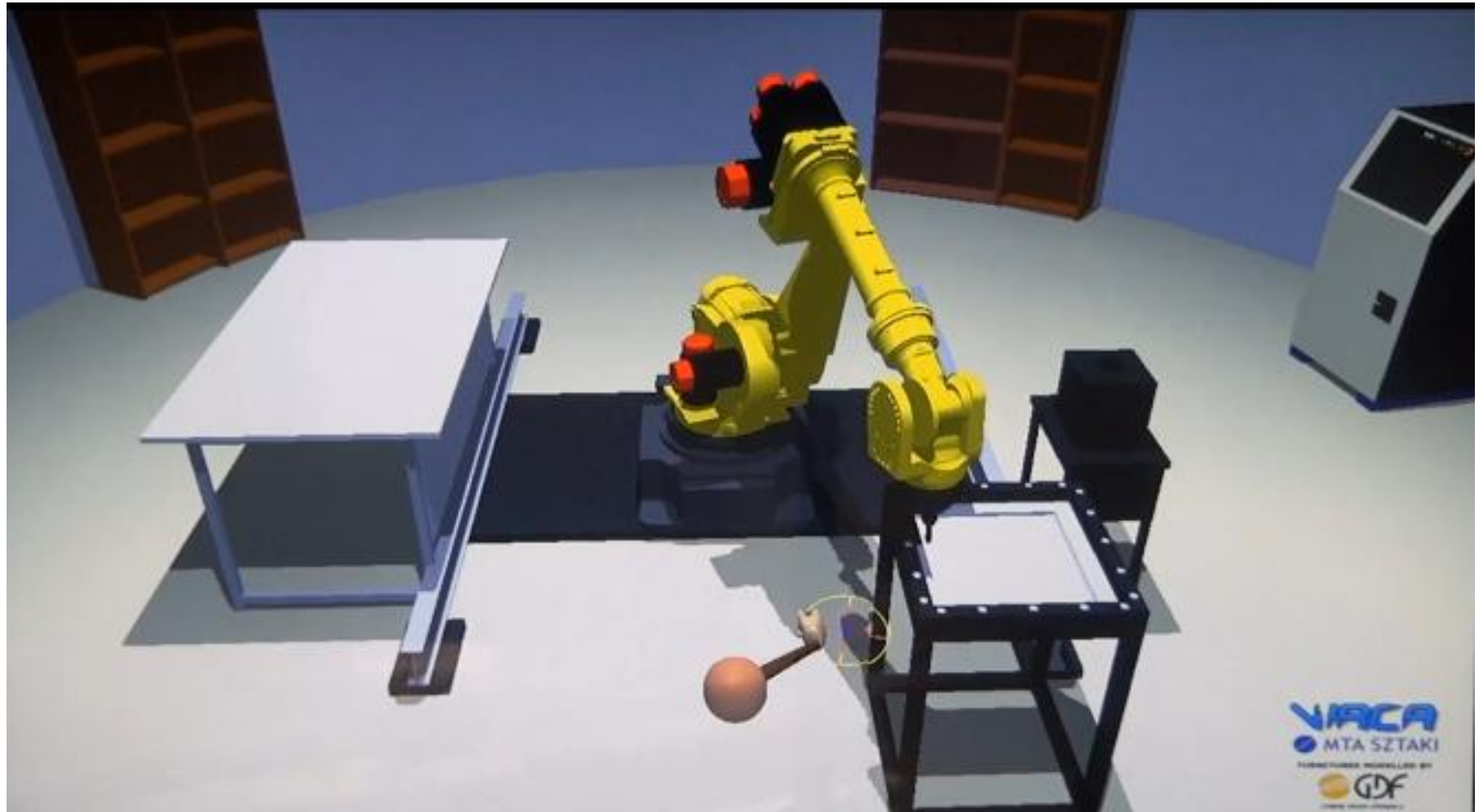


VIRCA

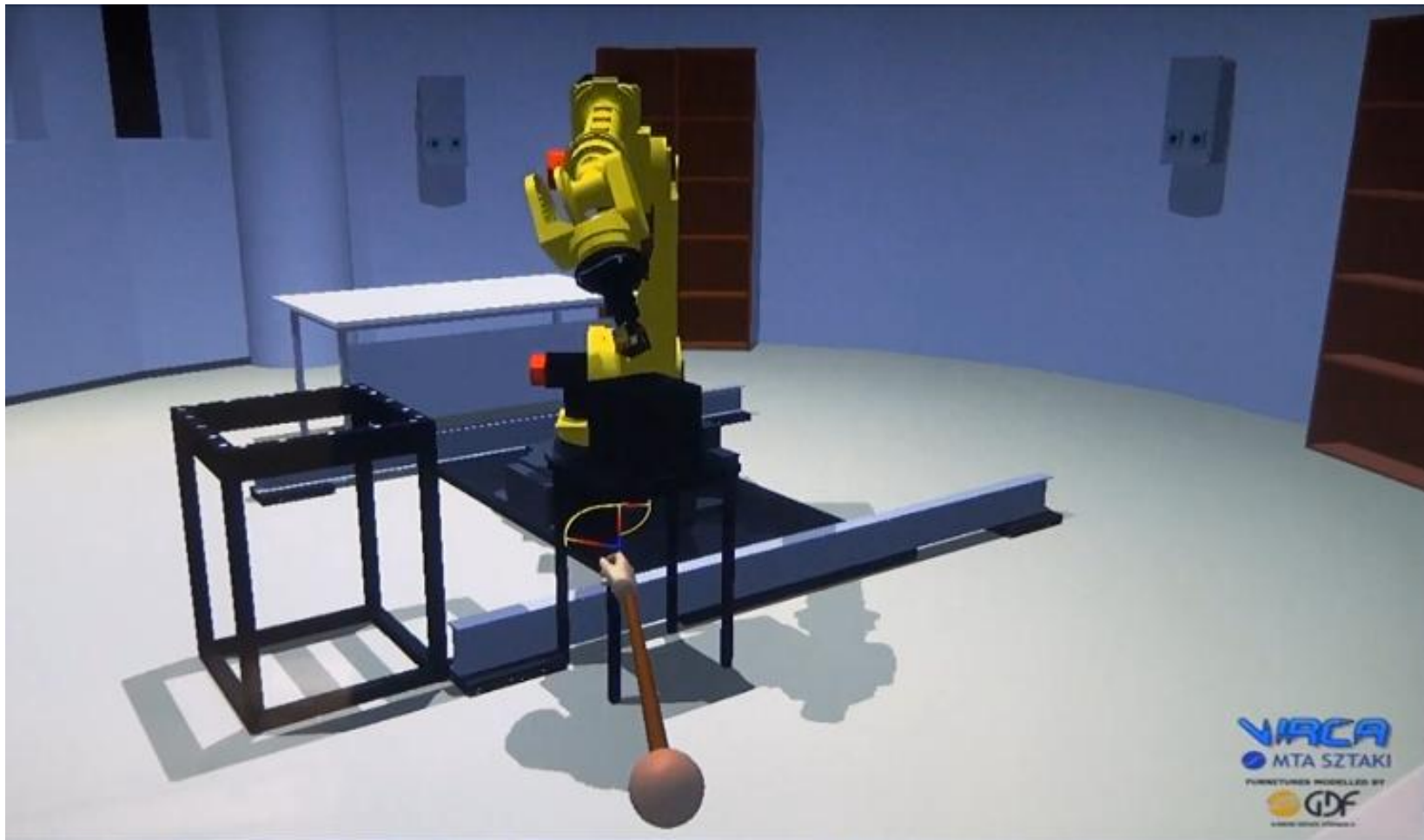
Connecting components in VirCA



Visualization of Incremental Sheet Forming



Visualization of Rubik's Cube solving



Visualization of multifunctional furniture



Conclusions

3D visualization in industry helps in

- *better understanding*
- *testing new or existing systems*
- *direct control of the components*

Results are presented in <http://robotmodell3d.hu>

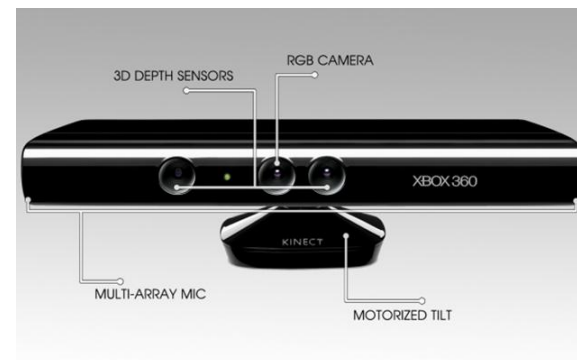
Future Plans

Connecting

- MS Kinect
- Wii controller
- Leonar3Do

Tele-operation

- controlling the robot via the model



Leonardo You are capable of more than you think

MOUSE VS
BIRD

The World's first
desktop VR kit

