

Digital holograms – i-Lumograms in museums

Dr. Stanislovas Zacharovas

Introduction



Advantages

- Possibility to show unreachable objects
- Full colour 3D image
- Animation
- Possibility to show objects “restored” with computer
- Possibility to show several independent objects from different location on same i-Lumogram
- Possibility to show unique live objects
- Holographic imaging and printing processes are usually geographically separated from each other
- i-Lumogram size up to 1 x 1,5 meters

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Introduction



i-Lumography

- Photo-material's surface is covered with spot holograms. Each such spot hologram (holopixel) contains images of pixels obtained from 3D scenes photographs taken from different viewing angles
- Several hundreds of 3D scenes photographs are used for holopixels recording
- When i-Lumogram is lighted, it “shows” different image to different viewing angle
- Two humans eyes see slightly different image of same 3D scene
- Observer perceives viewed as three-dimensional image

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Ideas for your exhibition



Real historical persons

WAX FIGURES CAN NOT MOVE – PERSONS ON I-LUMOGRAM CAN



i-Lumogram of Chamberlain of Lithuanian Royal castle in Trakai, XVII century, viewed from different viewing angles. Actor was filmed with Geola's HoloCam equipment in the castle and printed on Geola's holographic printer in Vilnius, Lithuania.

Permanent exhibition at Lithuanian Royal castle in Trakai.

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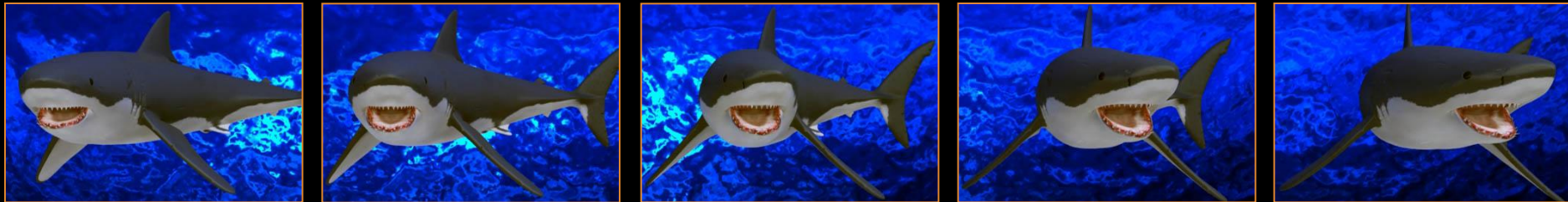
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Ideas for your exhibition



Animals that do not live in captivity

THOSE OBJECTS CAN BE EXHIBITED ONLY ON OUR I-LUMOGRAMS



i-Lumogram of White Shark, viewed from different viewing angles. Realistic 3D model was made with 3D Studio Max program in Romania, printed on Geola's holographic printer in Vilnius, Lithuania.

Permanent exhibition at museums Sea Life (Brighton, UK) and The Naturaliste Marine Discovery Centre (Australia).

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Rare flowers show

THOSE OBJECTS CAN BE EXHIBITED CONVINIENTLY ONLY ON OUR I-LUMOGRAMS



i-Lumogram of Orchid flower, viewed from different viewing angles. Filmed with Geola's HoloCam equipment and printed on Geola's holographic printer in Vilnius, Lithuania.

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Ideas for your exhibition



Archeological discoveries

THE ONLY WAY TO SHOW OBJECTS OUTSIDE OF THE DIGGING SITE



i-Lumogram of the Petro-glyphs on one of the Spain caves ceiling, viewed from different viewing angles. Filmed with Geola's HoloCam equipment in the cave and printed on Geola's holographic printer in Vilnius, Lithuania.

Manufactured for ITMA Foundation, Spain.

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Archeological discoveries

THE ONLY WAY TO SHOW OBJECTS OUTSIDE OF MUSEUMS CACHE



i-Lumogram of bas-relief from Valle Crucis Abbey in Llangollen, Wales, viewed from different viewing angles. Filmed with Geola's HoloCam equipment in Wales and printed on Geola's holographic printer in Vilnius, Lithuania.

Manufactured for National Museum of Wales.

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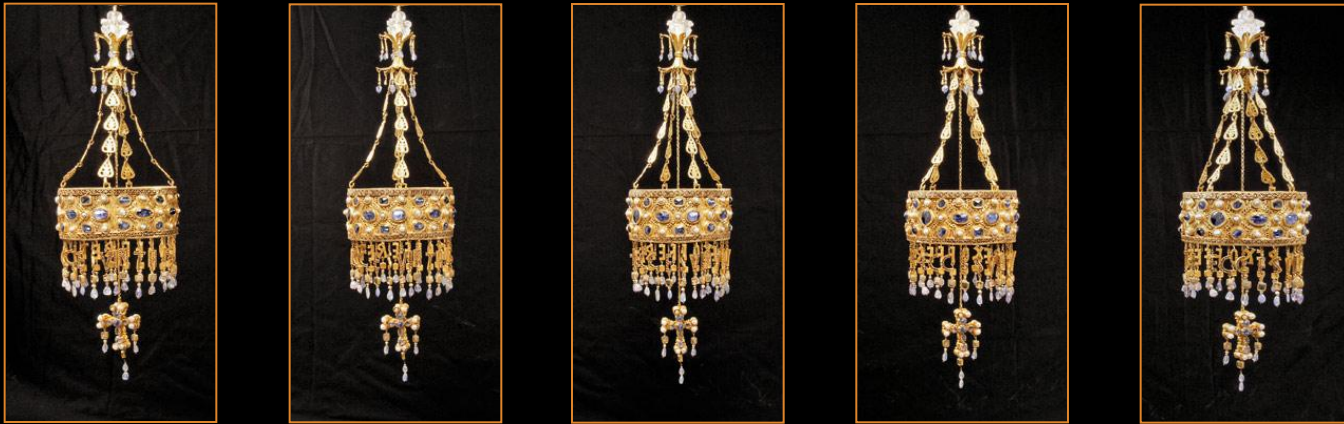
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Historical Art

THE ONLY WAY TO SHOW TOO VALUABLE OBJECTS AT ANY PLACE



i-Lumogram of Votive crown of the Visigoth King Recceswinth, viewed from different viewing angles. Filmed with Geola's HoloCam equipment in Spain and printed on Geola's holographic printer in Vilnius, Lithuania.

Manufactured for ITMA Foundation, Spain.

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Architecture

THE MOST REALISTIC HISTORICAL RECONSTRUCTION



i-Lumogram of Sent-Petersburg mole, viewed from different viewing angles. Realistic 3D model was made with 3D Studio Max program in Russia, printed on Geola's holographic printer in Vilnius, Lithuania.

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Architecture

NEW PROJECTS PRESENTATION



i-Lumogram of Japanese ecological house, viewed from different viewing angles. Realistic 3D model was made with 3D Studio Max program in Japan, printed on Geola's holographic printer in Vilnius, Lithuania.

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Architecture

NEW PROJECTS PRESENTATION



i-Lumogram of new Lithuanian Telecom building in Vilnius project, viewed from different viewing angles. Realistic 3D model was made with 3D Studio Max, printed on Geola's holographic printer in Vilnius, Lithuania.

Manufactured for DDB design company.

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Religion

THE ONLY WAY TO SHOW TOO VALUABLE OBJECTS AT ANY PLACE



i-Lumogram of the Spain National Treasure - *Cruz de la Victoria*, viewed from different viewing angles. Filmed with Geola's HoloCam equipment in Cathedral of San Salvador of Oviedo, Spain. Printed on Geola's holographic printer in Vilnius, Lithuania.

Manufactured for ITMA Foundation, Spain.

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Religion

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i-Lumogram of the 3D Kalachakra Mandala made in the USA by Arjia Rinpoche, viewed from different viewing angles. Filmed in USA, Printed on Geola's holographic printer in Vilnius, Lithuania.

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Ideas for your exhibition



Changing objects

THE ONLY WAY TO SHOW 3D OBJECTS CHANGES



i-Lumogram of Roman stables in Germany reconstruction, viewed from different viewing angles. Printed on Geola's holographic printer in Vilnius, Lithuania.

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Changing objects

THE ONLY WAY TO LOOK INSIDE 3D OBJECTS



i-Lumogram of Mummy, viewed from different viewing angles. 3D computer model under Western Australia Supercomputer Project in University Of Western Australia, Printed on Geola's holographic printer in Vilnius, Lithuania.

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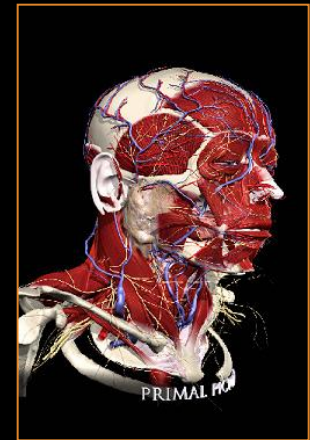
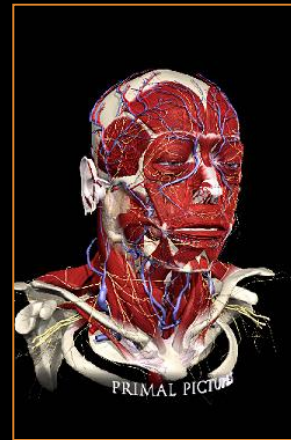
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Ideas for your exhibition



Medicine

THE ONLY WAY TO LOOK INSIDE HUMAN BODY IN REAL 3D



i-Lumogram of what is under human face skin, viewed from different viewing angles. 3D model made in Maya program in USA, printed on Geola's holographic printer in Vilnius.

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Medicine

THE ONLY WAY TO LOOK INSIDE HUMAN BODY IN REAL 3D



i-Lumogram of human lungs. For printing we have used tomographic scan of live human body.

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About us



Geola – General Optics Laboratory

Geola Digital uab (Lithuania) – experimental research and manufacture

Geola Technologies Ltd. (UK) – theoretical research

Inventions in holography:

- Digital holographic printing with pulsed lasers
- Hologram copying
- Live objects imaging for holographic printing
- Holographic screens for autostereoscopic projection

Activity:

- R&D, consulting
- Photomaterials for holography distribution
- Holographic printing

Manufactured equipment:

- Pulsed RGB lasers and holographic printers
- Imaging equipment for holographic printing
- High-energy pulsed lasers and holographic studios
- Special pulsed lasers for plasma research



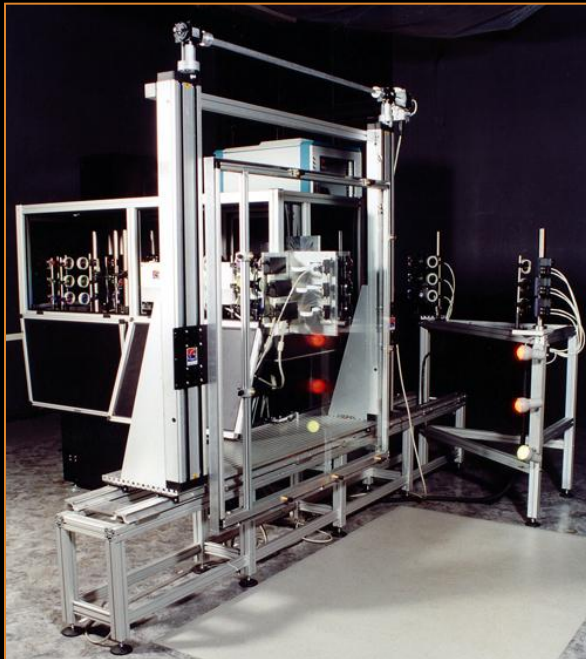
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Equipment



First in the world digital holographic printer with pulsed RGB laser – manufactured in Vilnius, Lithuania, in 2001.



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Equipment



Current Geola's holographic printer in Vilnius, Lithuania

Productivity:

- i-Lumograms from 40x60cm to 1x1,5m
- 1kv. meter in 7 hours
- i-Lumograms to 40x60cm
- 1kv. meter in 26 hours



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Equipment



Holographic imaging equipment invented by Geola



Portable HoloCam – live subjects holographic imaging



HoloCam studio

Holographic imaging and printing usually are geographically separated

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Equipment



Hologram copying equipment invented by Geola

Productivity:

- Holograms to 20x30cm
– one copy per 0.5 minutes

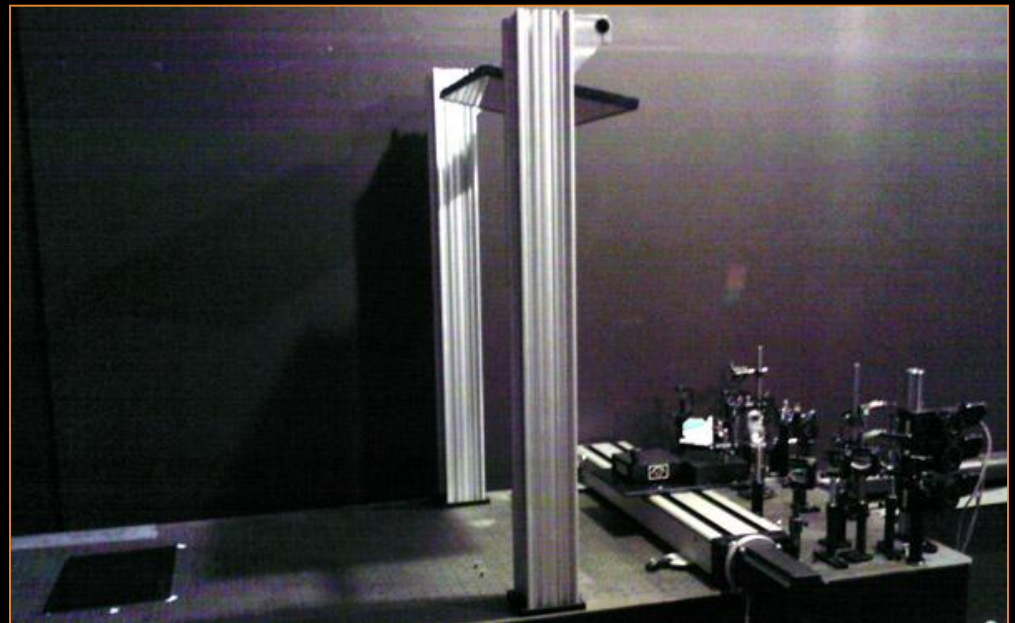
Currently photomaterial allows to
produce two-colours copies – see
sample below:



Original



Copy



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Equipment



i-Lumogram lighting

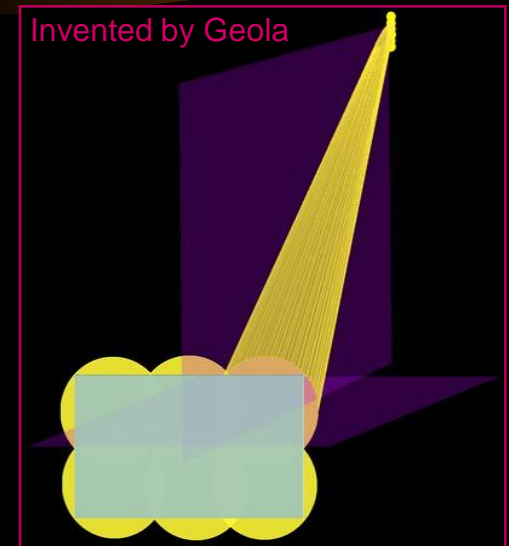
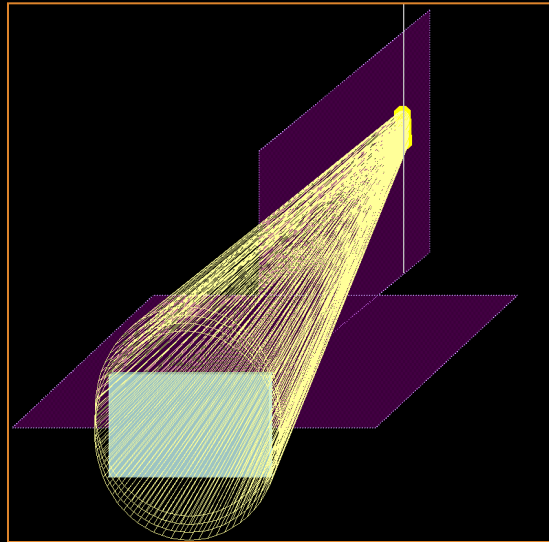
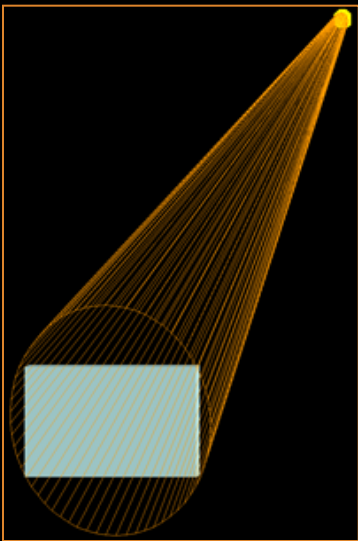


Image on i-Lumogram becomes visible when it is illuminated by one or several point light sources (halogen bulbs, LEDs)

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Equipment



i-Lumogram lighting



Examples of proper i-Lumogram lighting

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Equipment



Geola's lighting solutions





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Let's work together

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