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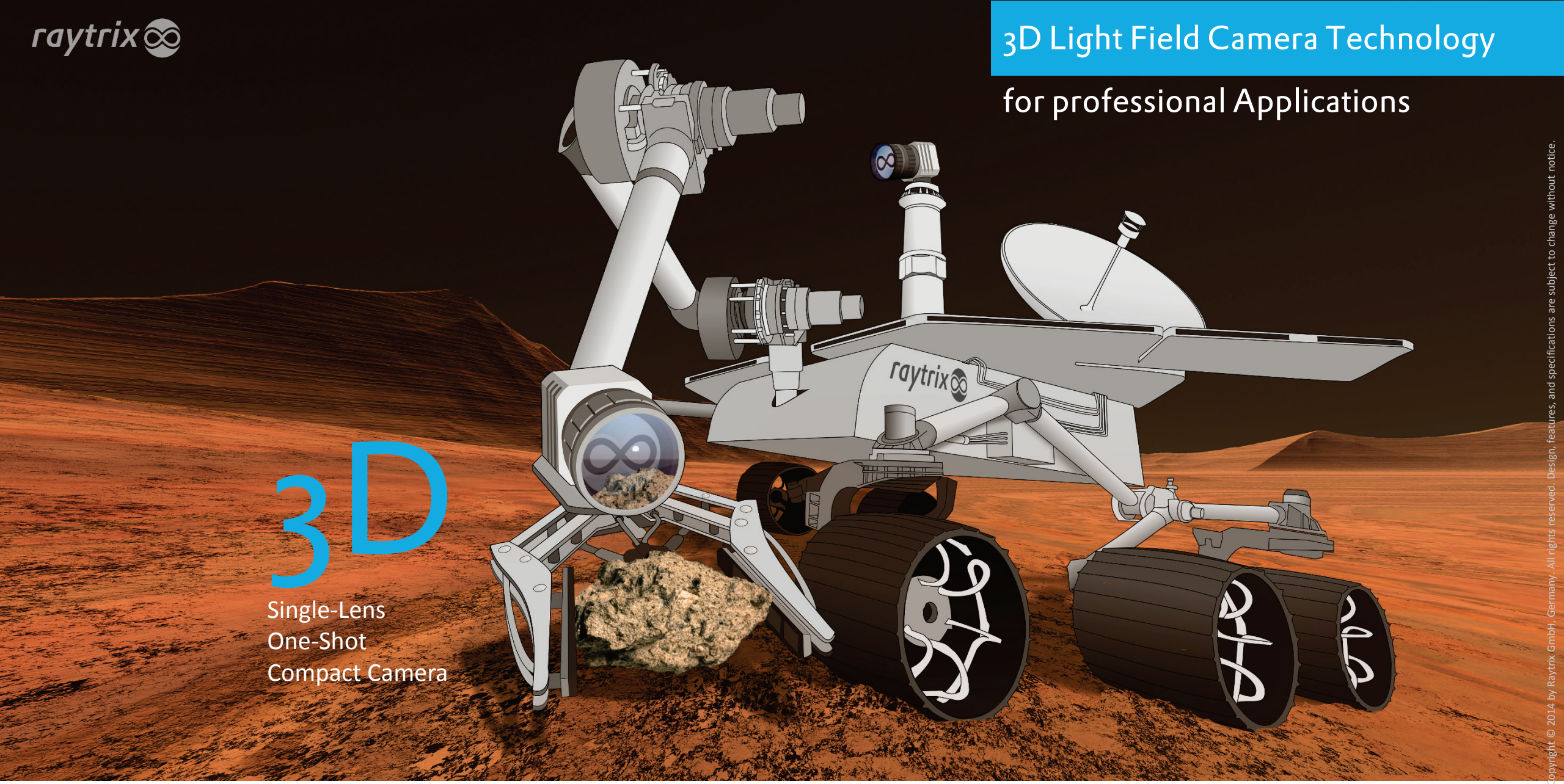
3D Light Field Camera Technology

for professional Applications



3D

Single-Lens
One-Shot
Compact Camera

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product design award 2014

Changeable Optics
Standard Mount

Focus after the Fact
with Extended DoF

Ultra High Resolution
10MP@7FPS

Video
2MP@30FPS

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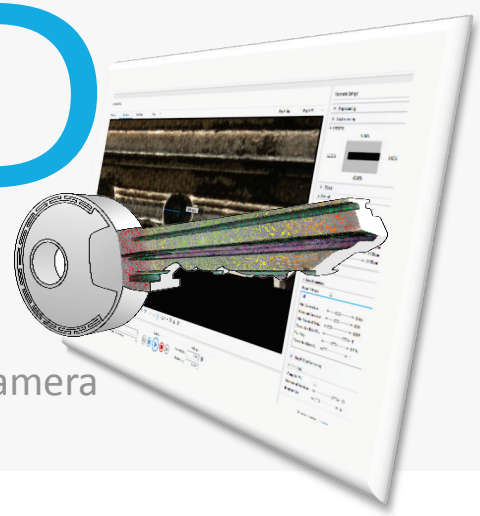
3D Light Field Cameras

Enabling Technology for 3D Measurements

- Changeable Optics Standard C-Mount
- Focus after the Fact with Extended DoF
- R8 Video 2MP@30FPS
- R42 Ultra-HR 10MP@7FPS

3D

Single-Lens
One-Shot
Compact Camera



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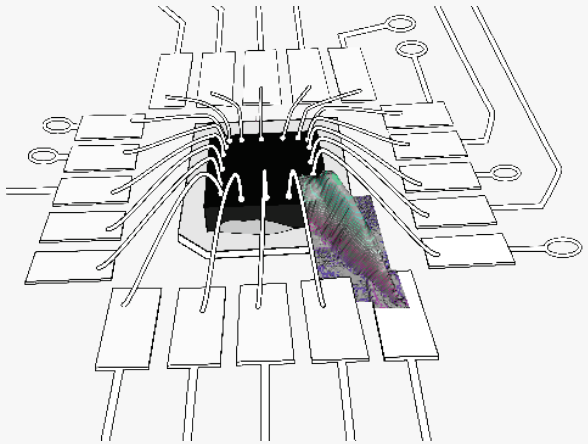
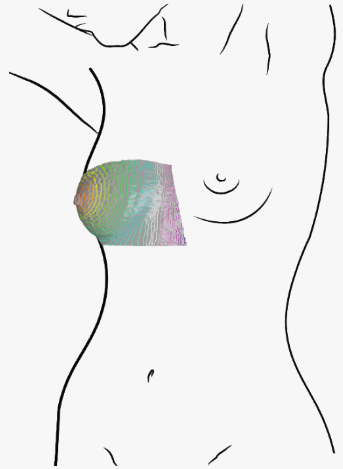
3D Light Field Camera Applications

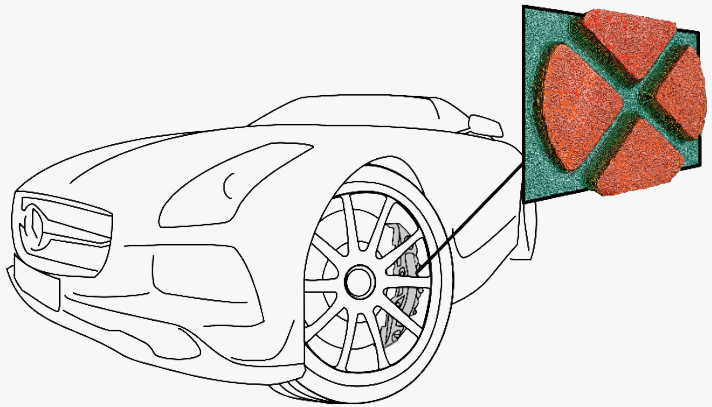


Bumps & Bonding Wire Measurement

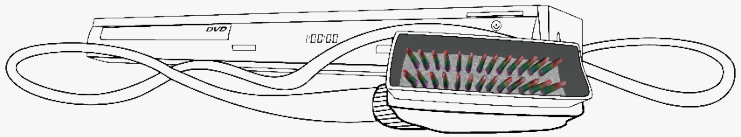
Quality Inspection of Small Parts



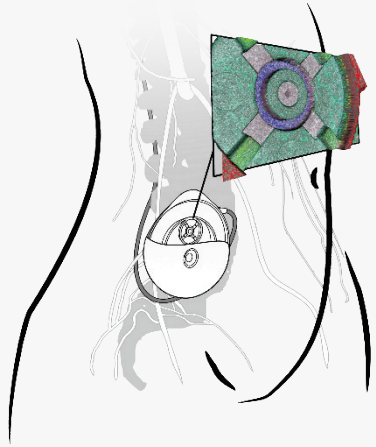
Volume Measurement of Human Body Skin



Metallic Surface Inspection



Measurement of Difficult-to-Access Pins



Metrology of Spray-Cast Materials

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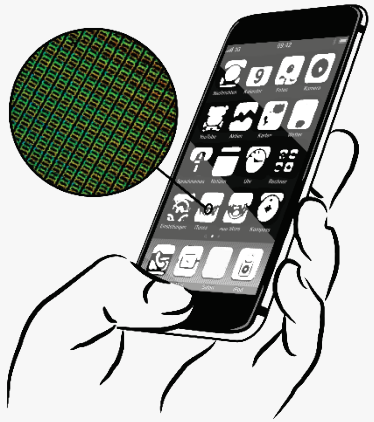
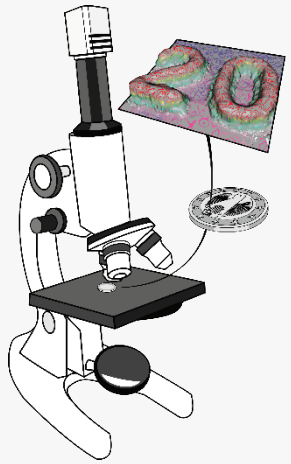
3D Light Field Camera Applications

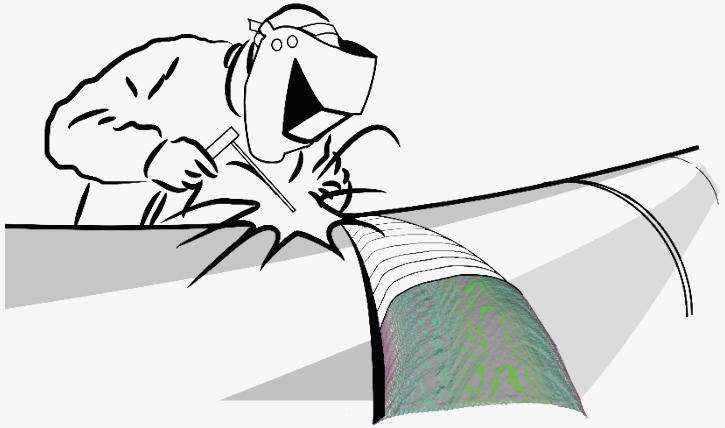


Microscopic Panel & Solar Cell Inspection

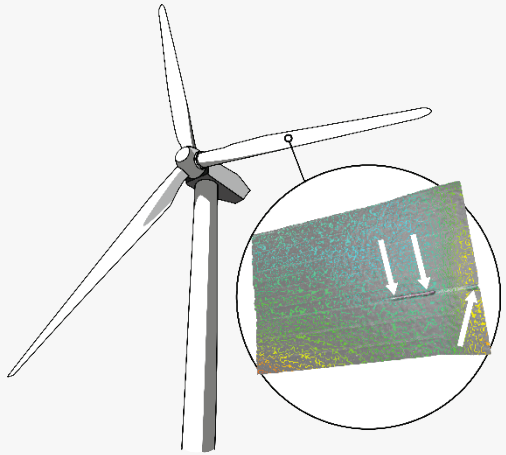
Plant Growth Analysis



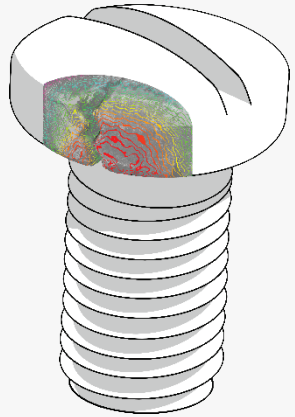
Microscopy



Weld Inspection



Carbon Surface Inspection



Screw Head Scratch Detection

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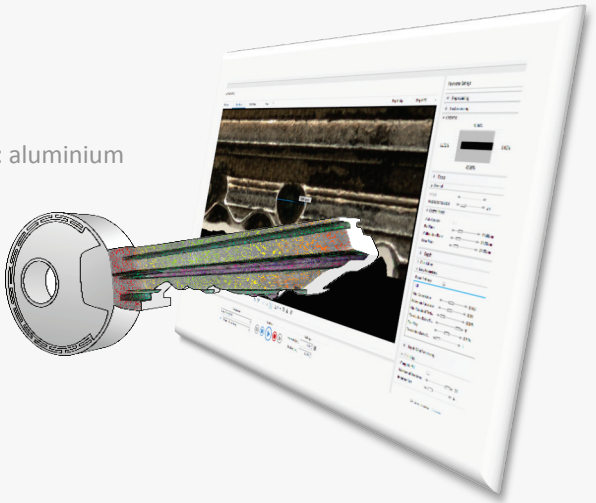
R42/R10/R8 3D Light Field Camera

for professional Applications

3D
Single-Lens
One-Shot
Compact Camera

Application	Machine Vision | Microscopy | Life Science | R&D | Education | Flow Mechanics | Video | Medical | Computational Photography
Models	• R42-Micro Color: F/23, 41.5 Megarays, 7 FPS • R42-Color: F/2.8, 41.5 Megarays, 7 FPS • R10-Mono: F/2.8, 10 Megarays, 7 FPS • R8-Color: F/2.8, 8 Megarays, 30 FPS
Light Field Sensor	• R42: 41.5 Megarays, 10 MP effective lateral resolution • high dynamic range (HDR), 2/3“ sensor class, back side illuminated pixel (BSI)
Integration time	• R8 (4k): min. 8µs, R42 (Full resolution): min. 16µs
Speed	• R42: 7 FPS at 10 MP (optional R8: 30 FPS at Full HD)
Body	• dimensions: 39mm (W), 39mm (H), 28mm (D), weight: 71g, case material: aluminium • award winning design, tripod adaptor
Interface	• USB 3.0 superspeed (micro-B with screw lockers) • external hardware trigger input
Optics	• micro lens array (MLA) with aperture F/2.8 • optional R42-microscopy version with aperture F/23 • 6x extended depth of field (DoF) • changeable C-mount standard lens
Power consumption	• Powered by USB 3.0 cable • 350mA (800mA peak)



Windows 8 Compatible
Windows

NVIDIA
CUDA

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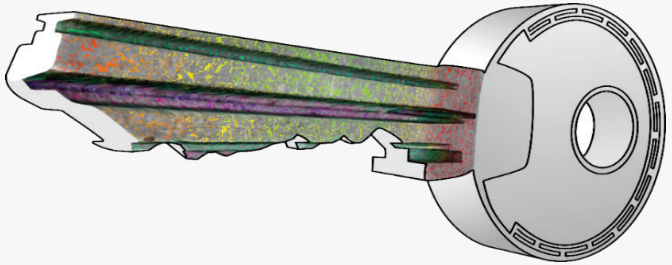
R42 / R10 / R8 3D Light Field Software

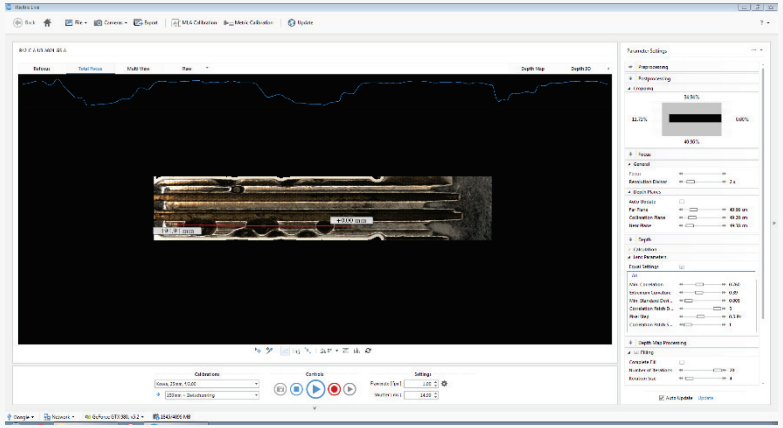
for professional Applications

3D

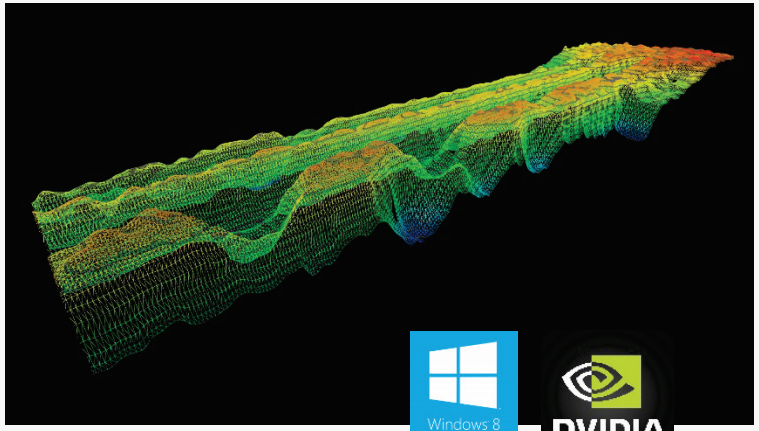
Single-Lens
One-Shot
Compact Camera

Application	Machine Vision | Microscopy | Life Science | R&D | Education | Flow Mechanics | Video | Medical | Computational Photography
Software	• SDK/API programming interface DLL • MVTec® Halcon® plugin • multiview perspective shift • 3D depth map measurement • software re-focus after the fact • direct access to 4D light field raw data • glasses-free (autostereo) 3D monitor plugin
Requirements	• NVIDIA® CUDA® compute capability 2.0 (GTX 980 or higher) • Microsoft® Windows® 7/8 64 bit, intel® i7, intel® USB 3.0





Easy 3D measurements in metric units



3D depth map view of a key

Windows 8 Compatible
Windows

NVIDIA
CUDA

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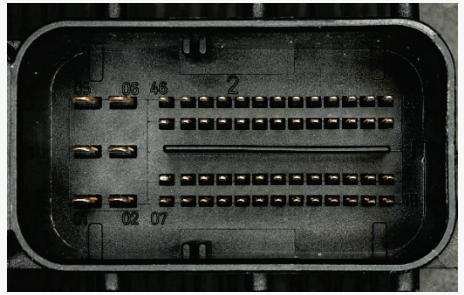
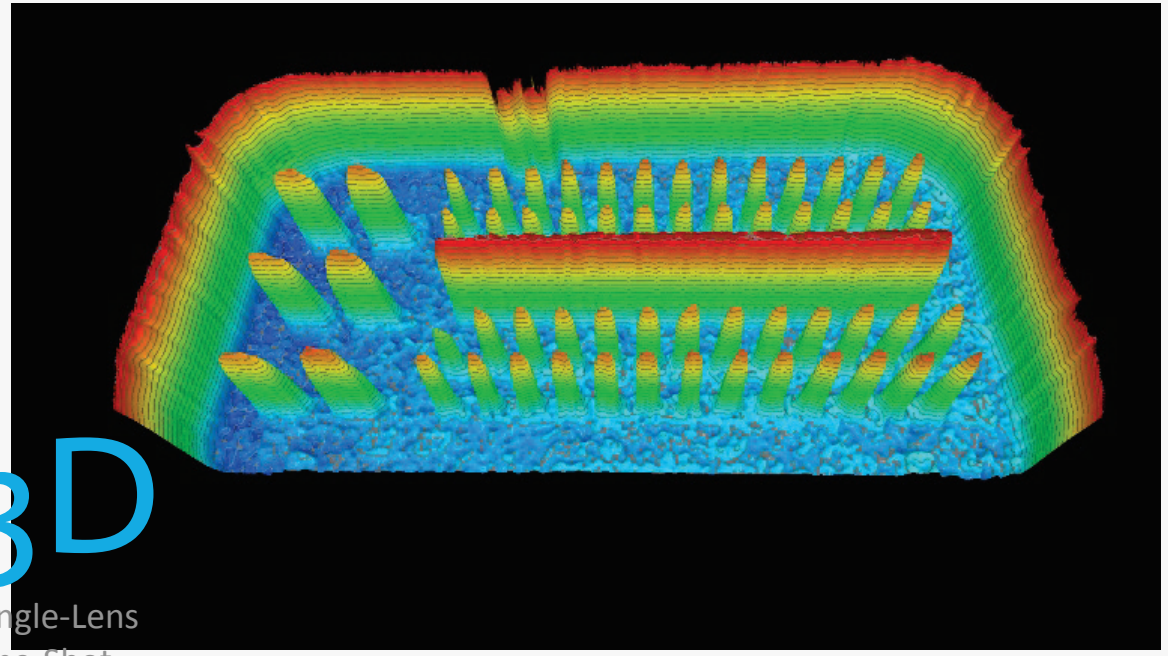
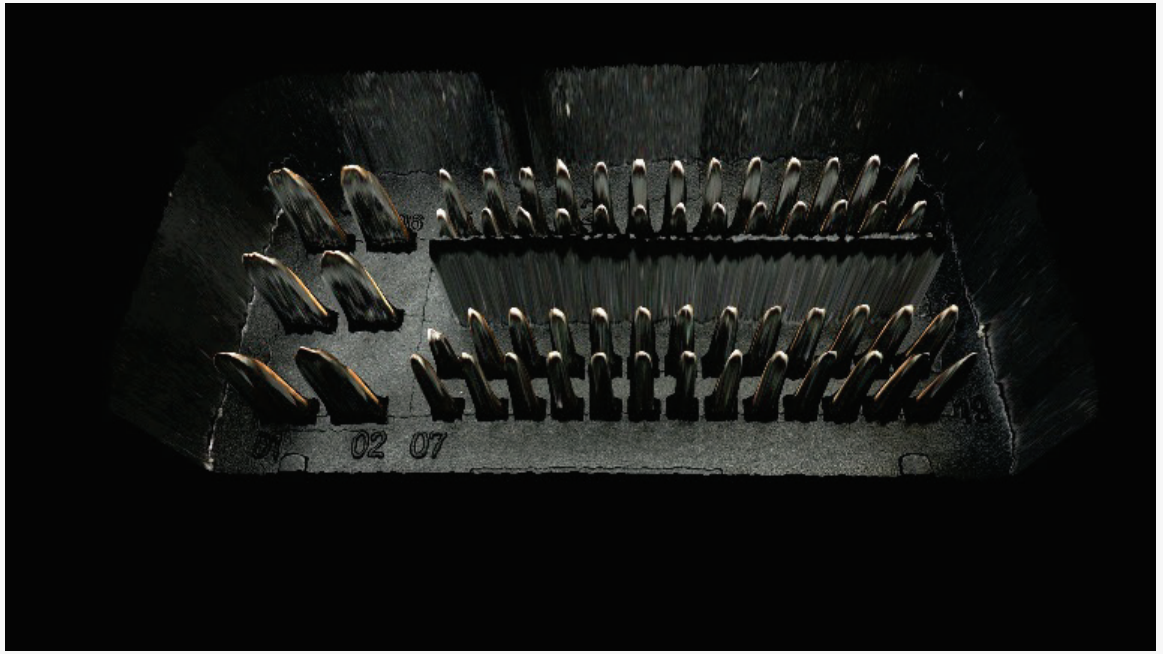
R42/R8 3D Light Field Camera

for Pin-Length Inspection







3D

Single-Lens
One-Shot
Compact Camera

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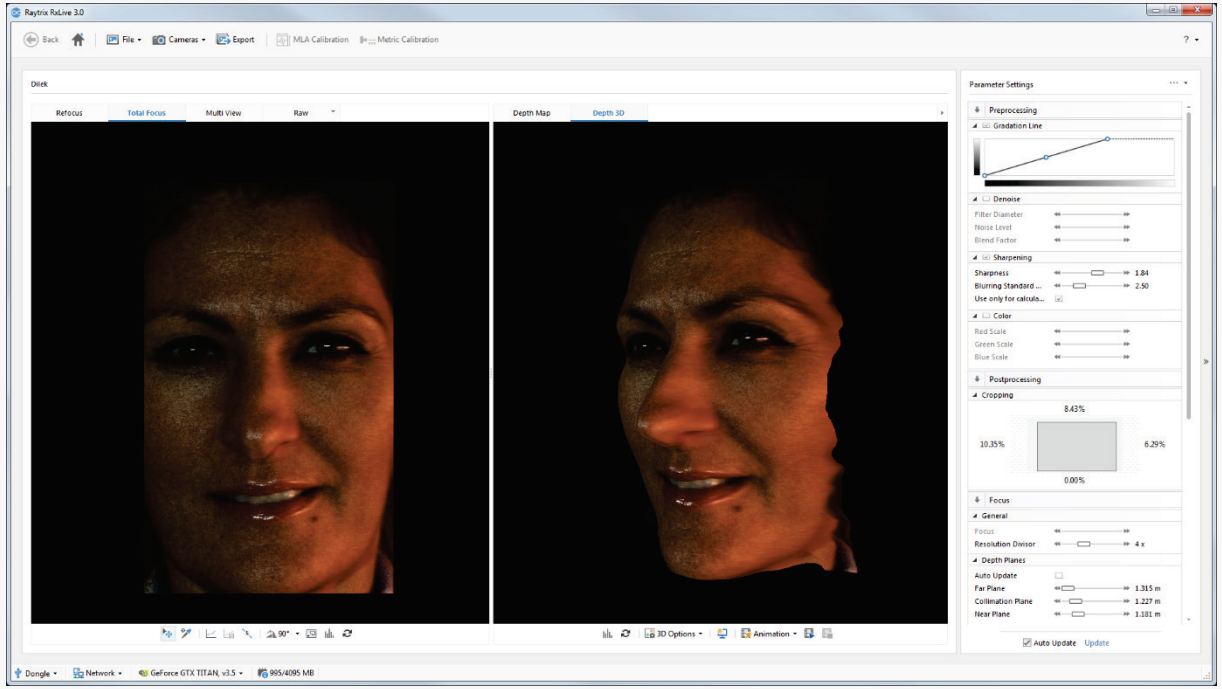
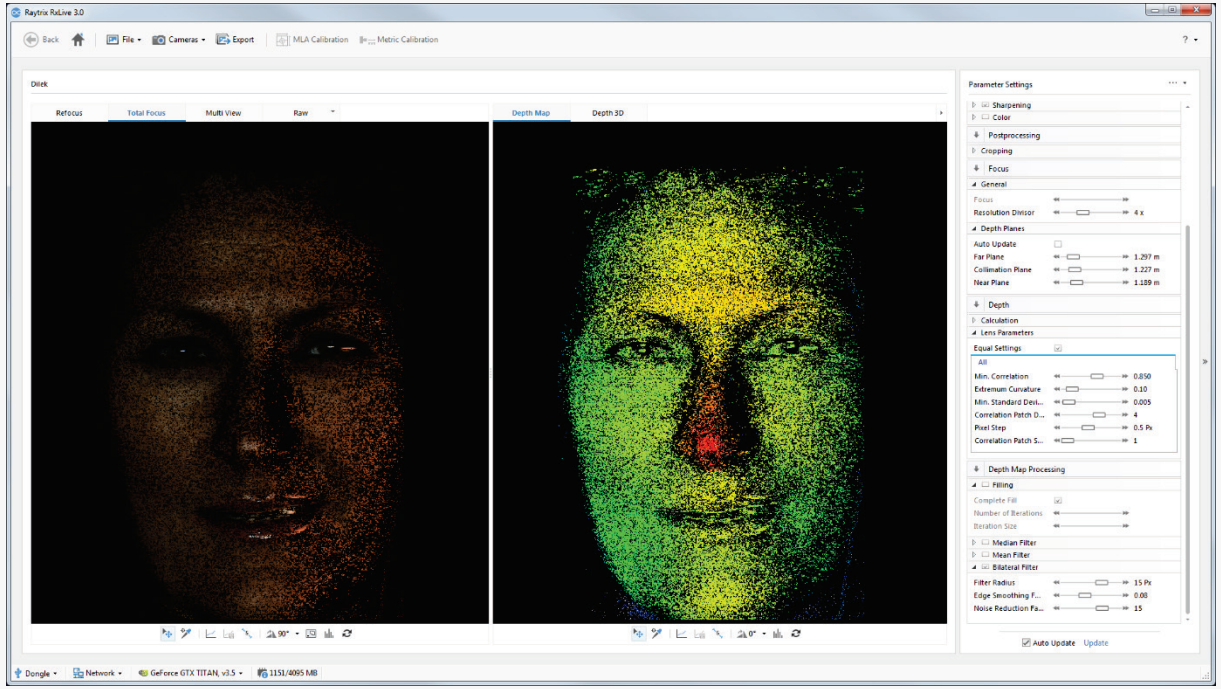
R42 / R8 3D Light Field Camera

for Face Detection





3D

Single-Lens
One-Shot
Compact Camera

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R8 3D Light Field Camera

Max Depth Resolution (Z)	Depth-of-Field (Z)	Field-of-View (X)	Field-of-View (Y)	Max Lateral Resolution (X,Y)	Free Working Distance (Z)	Focal Length
22,2µm	4,56mm	16,1mm	9,08mm	8,82µm	250mm	100mm
42,2µm	7,1mm	22,6mm	12,8mm	12,3µm	42,5mm	12mm
86,9µm	15,6mm	32,24mm	18,19mm	17,9µm	50mm	25mm
88,7µm	17,9mm	32,2mm	18,2mm	17,7µm	440mm	100mm
353,4µm	44,3mm	68,0mm	38,38mm	36,7µm	102,5mm	12mm
392µm	75mm	68mm	38mm	37,2µm	850mm	100mm
585µm	86,1mm	85,5mm	48,3mm	46,5µm	200mm	25mm
1,75mm	220,5mm	155mm	87,5mm	83,6µm	400mm	25mm
3,62mm	637,7mm	328mm	185mm	174µm	900mm	25mm
6,12mm	2,55m	1,02m	0,575m	333µm	2,9m	25mm
13,54mm	1,88m	414mm	234mm	225µm	4,86m	100mm
40,3mm	5,58m	846mm	478mm	454µm	9,86m	100mm

R42 3D Light Field Camera

R42, F/2.8 Focal Length

Max Depth Resolution (Z)	Depth-of-Field (Z)	Field-of-View (X)	Field-of-View (Y)	Max Lateral Resolution (X,Y)	Free Working Distance (Z)	Focal Length
11,12µm	2,3mm	16,1mm	11,2mm	4,41µm	250mm	100mm
21,55µm	4,03mm	22,6mm	15,7mm	6,19µm	42,5mm	12mm
44,1µm	8,4mm	32,24mm	22,4mm	8,82µm	50mm	25mm
44,6µm	9,2mm	32,2mm	22,4mm	8,84µm	440mm	100mm
187,3µm	28,9mm	68,0mm	47,3mm	18,5µm	102,5mm	12mm
197µm	140mm	68mm	47mm	18,6µm	850mm	100mm
303,1µm	52,1mm	85,5mm	59,43mm	23,34µm	200mm	25mm
967µm	146,2mm	155mm	108mm	42,12µm	400mm	25mm
3,76mm	480mm	328mm	228mm	88µm	900mm	25mm
7,07mm	1,17m	414mm	288mm	113µm	4,86m	100mm
9,51mm	2,24m	1,02m	0,71m	258µm	2,9m	25mm
28,2mm	3,9m	846mm	588mm	229µm	9,86m	100mm

R10µ Mono

3D Light Field Camera

R42, F/2.8 Focal Length

Max Depth Resolution (Z)	Depth-of-Field (Z)	Field-of-View (Y)	Field-of-View (X)	Max Lateral Resolution (X,Y)	Free Working Distance (Z)	Magnification
1,5µm	0,2mm	1mm	1,2mm	0,3µm	16mm	10x
5µm	0,6mm	1,9mm	2,3mm	0,6µm	17mm	5x
15µm	2mm	3,7mm	4,5mm	1,2µm	6,5mm	2,5x

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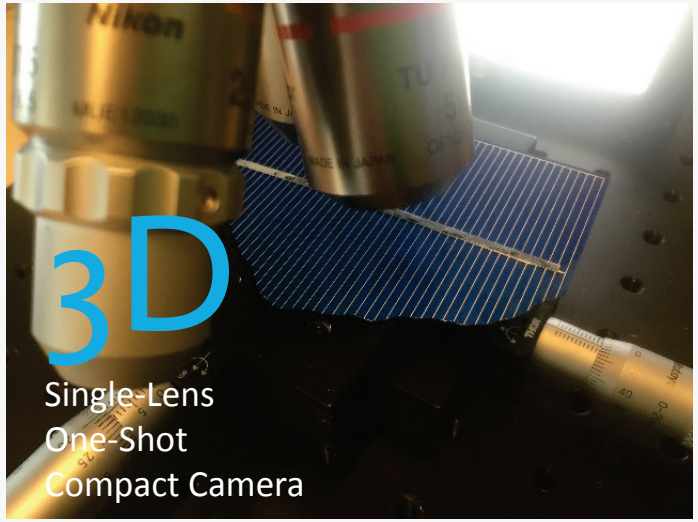
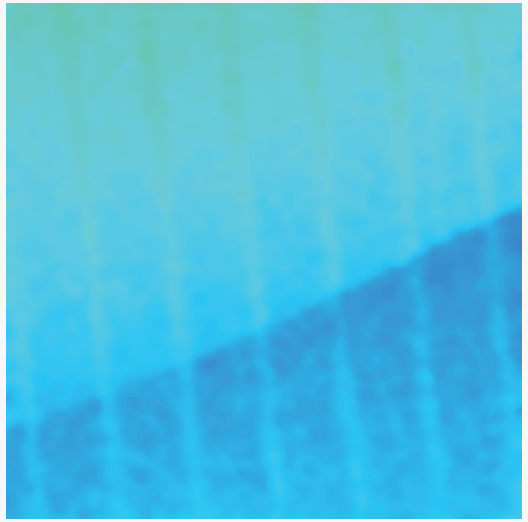
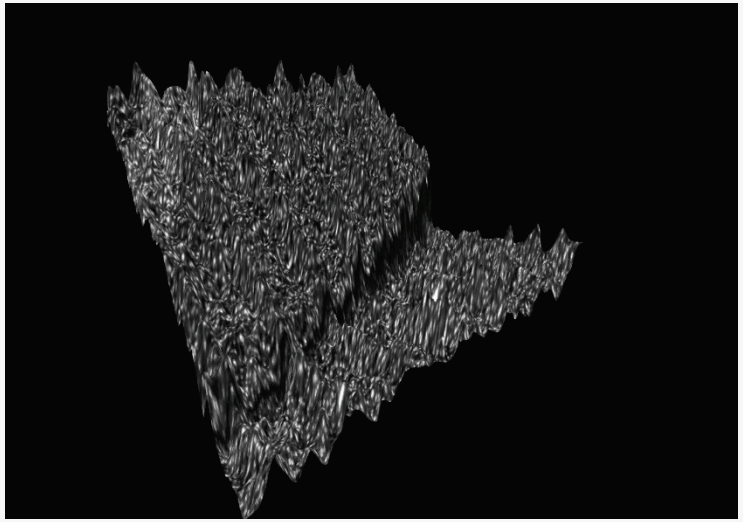
R10-microscope

3D Light Field Camera

for Solar Cell Quality Inspection







Max Depth Resolution (Z)	Depth-of-Field (Z)	Field-of-View (Y)	Field-of-View (X)	Max Lateral Resolution (X,Y)	Free Working Distance (Z)	Magnification
1,5µm	0,2mm	1mm	1,2mm	0,3µm	16mm	10x
5µm	0,6mm	1,9mm	2,3mm	0,6µm	17mm	5x
15µm	2mm	3,7mm	4,5mm	1,2µm	6,5mm	2,5x

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Reference List

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