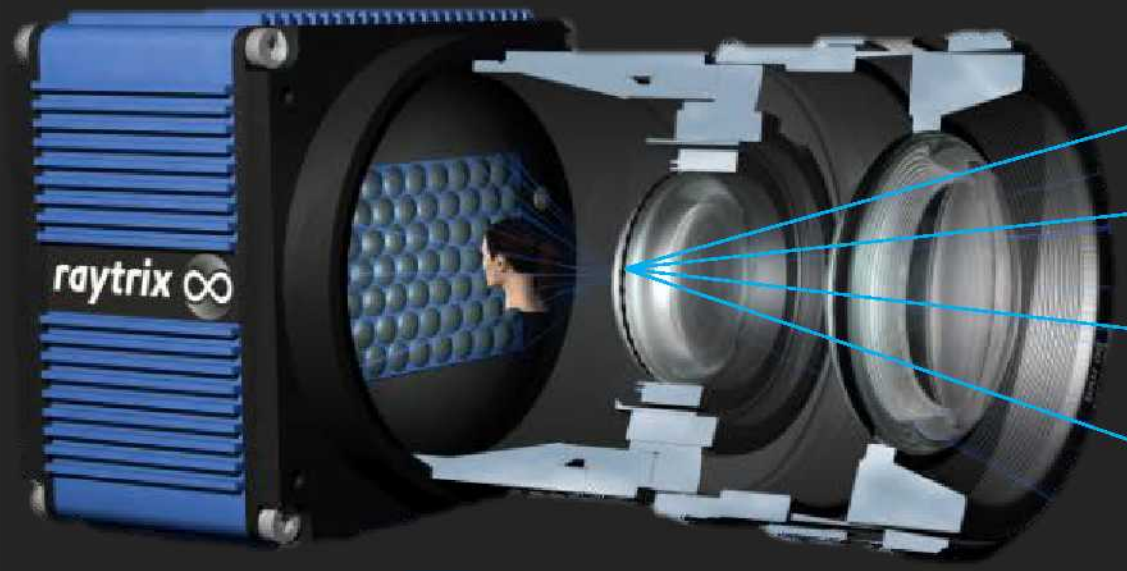
3D Light Field Camera Technology

raytrix

3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera



Single-lens 3D Light Field

R11 High End Cameras

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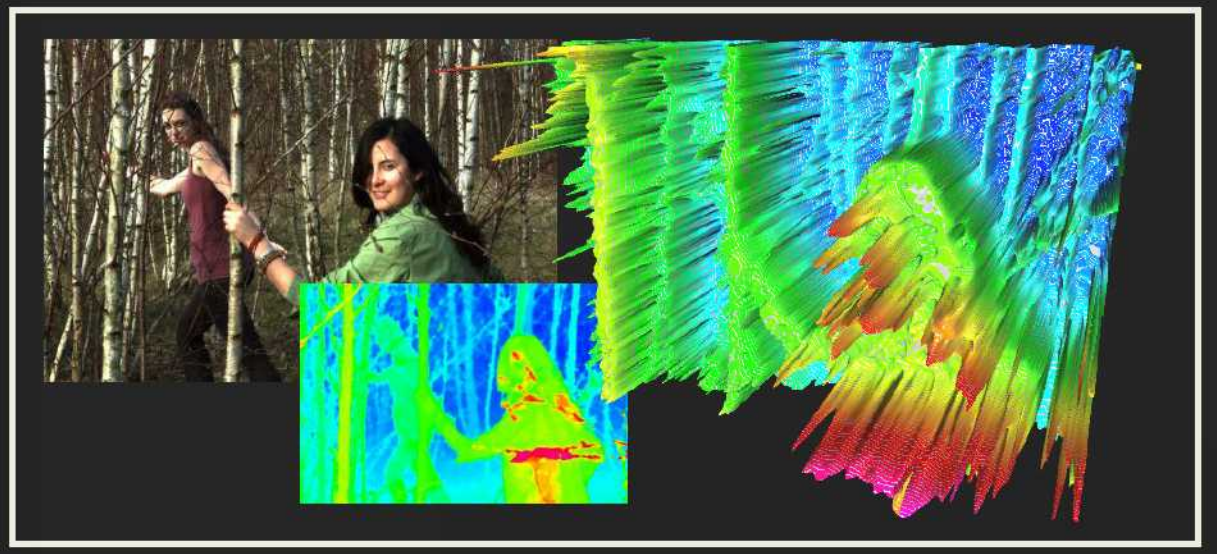
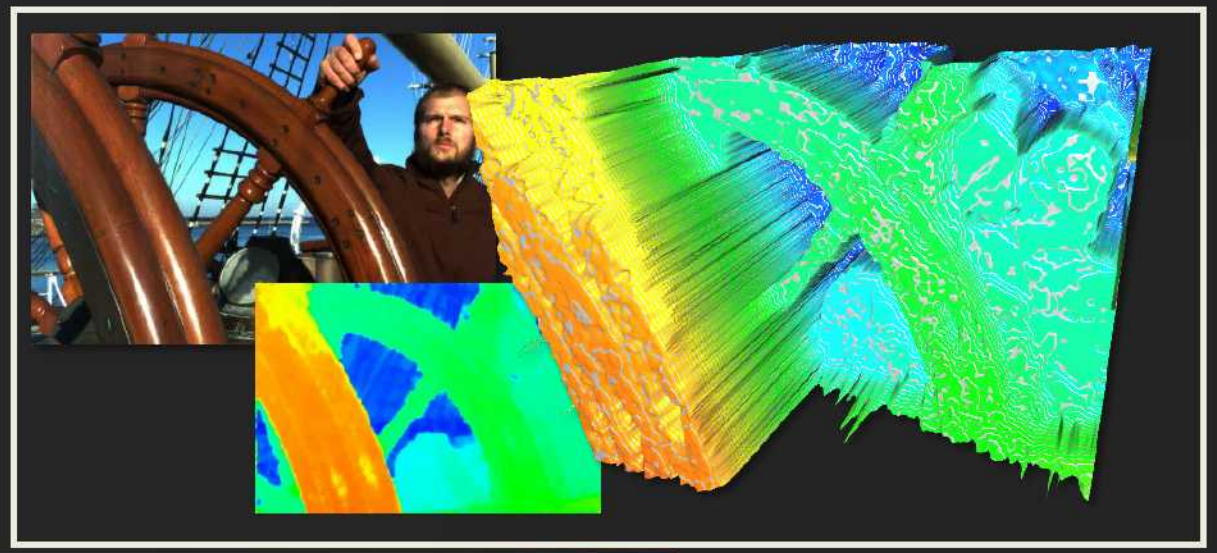
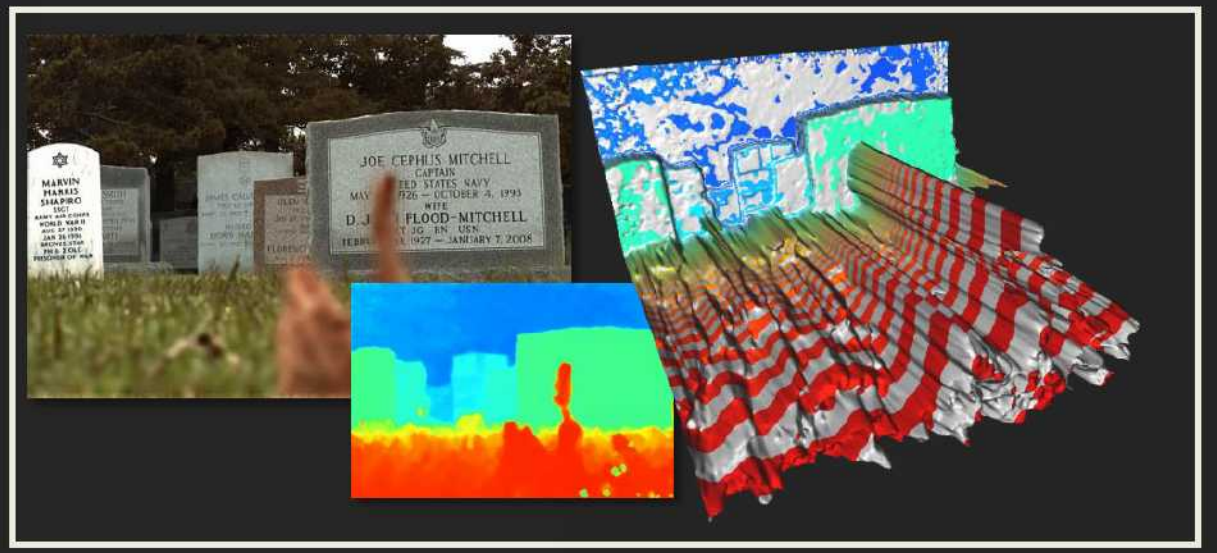
R11 3D Photography

Light Field Camera Technology* raytrix

3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera







* US-Pat.-No.: 2012/0050562 A1 , CHIP-Award 2012: „Innovation of the year“

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R11 3D Bottle Detection

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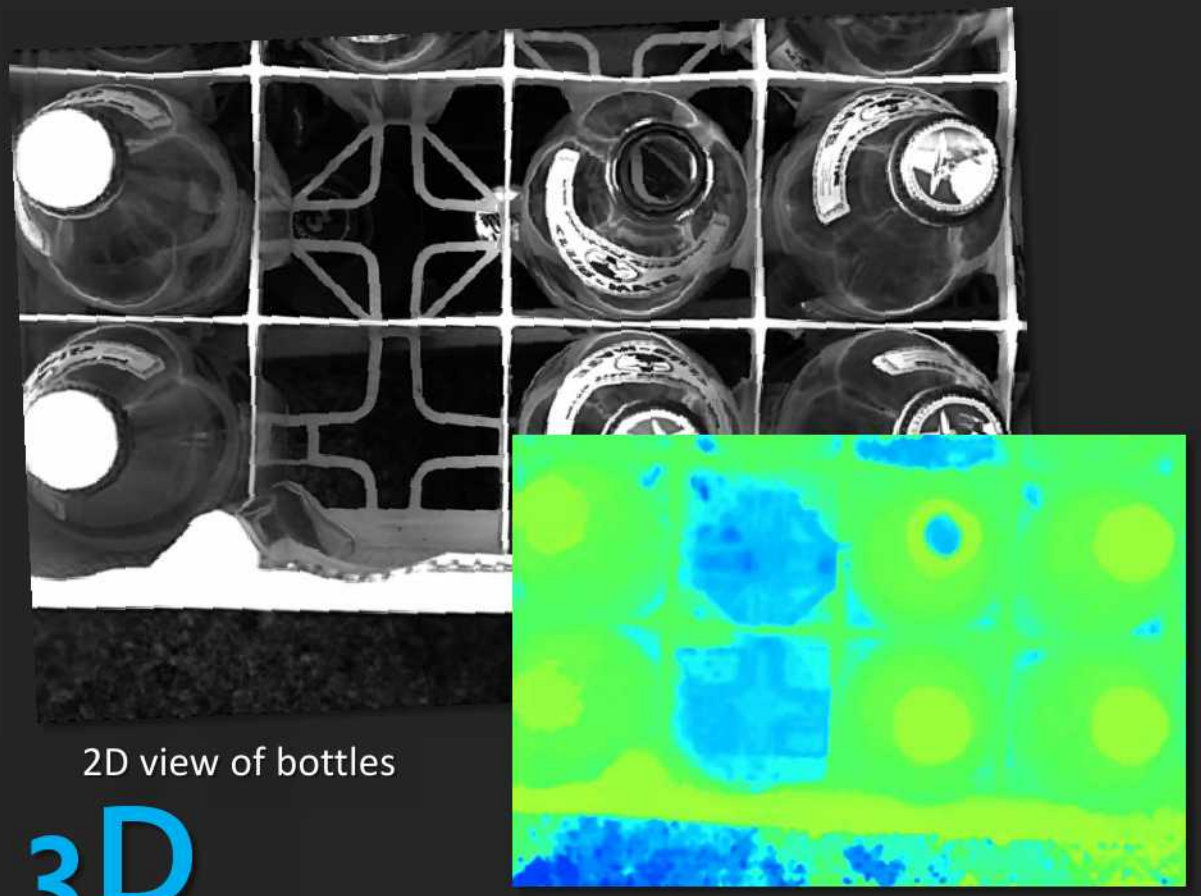
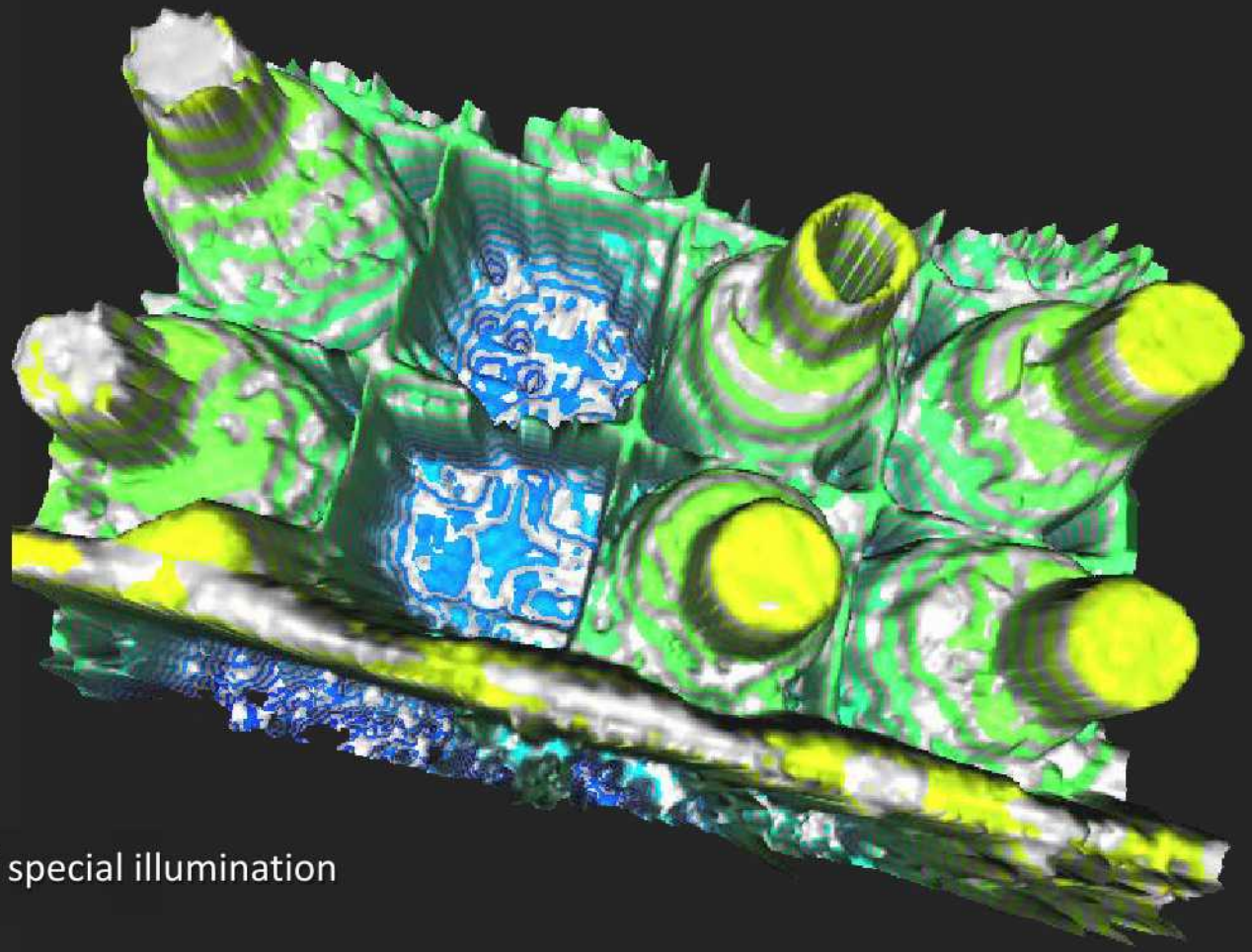
3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera



2D view of bottles

3D Light Field Camera



3D depth map without the need of special illumination

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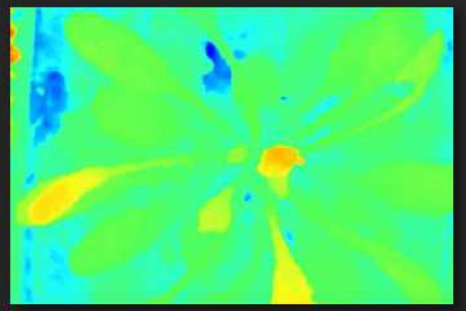
R11 Image Segmentation / Plant Analysis

3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera

2D view of a small plant



3D depth map without the need of special illumination

3D Light Field Camera

Automated 3D image segmentation of leafs based on 3D depth map and texture information

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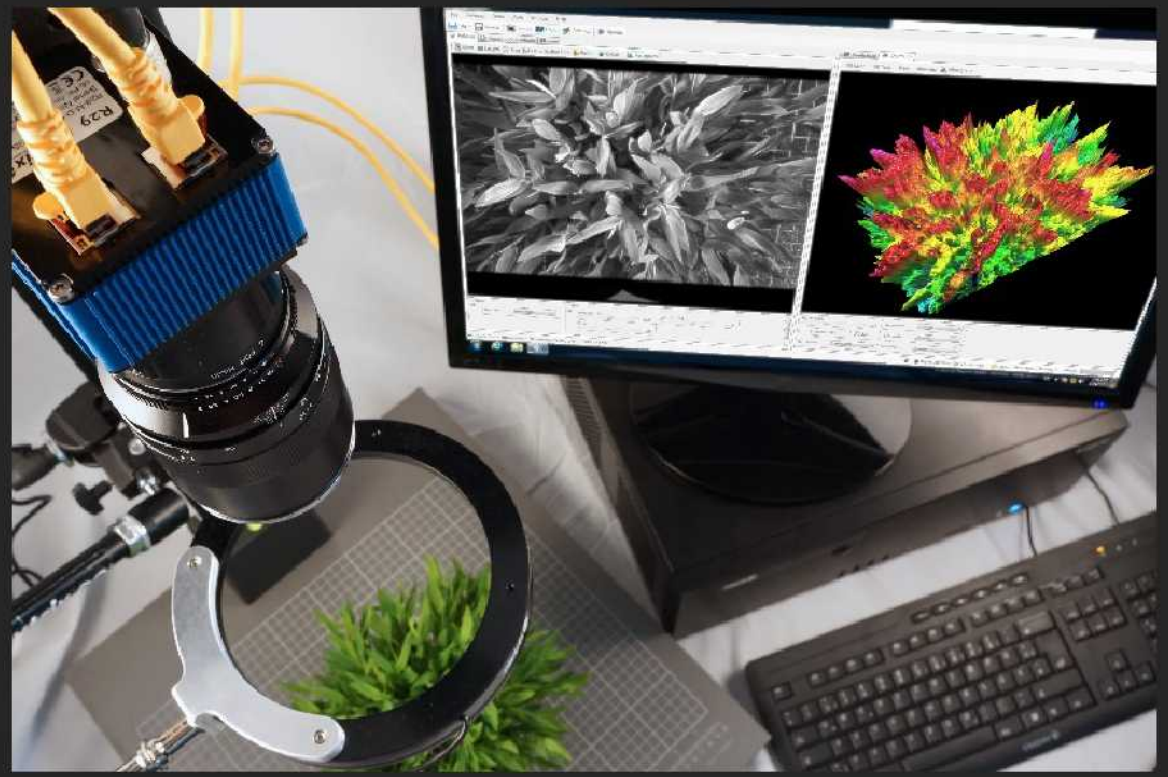
R11 Image Segmentation / Plant Analysis

Light Field Camera Technology* raytrix

3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera



3D Light Field Camera

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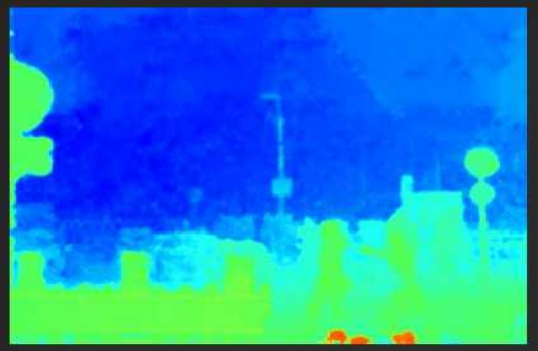
R11 Tele 3D with 500mm

3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera

Location (Google Maps)



Color coded depth map

Total focus

Full-HD resolution

3D Light Field Camera

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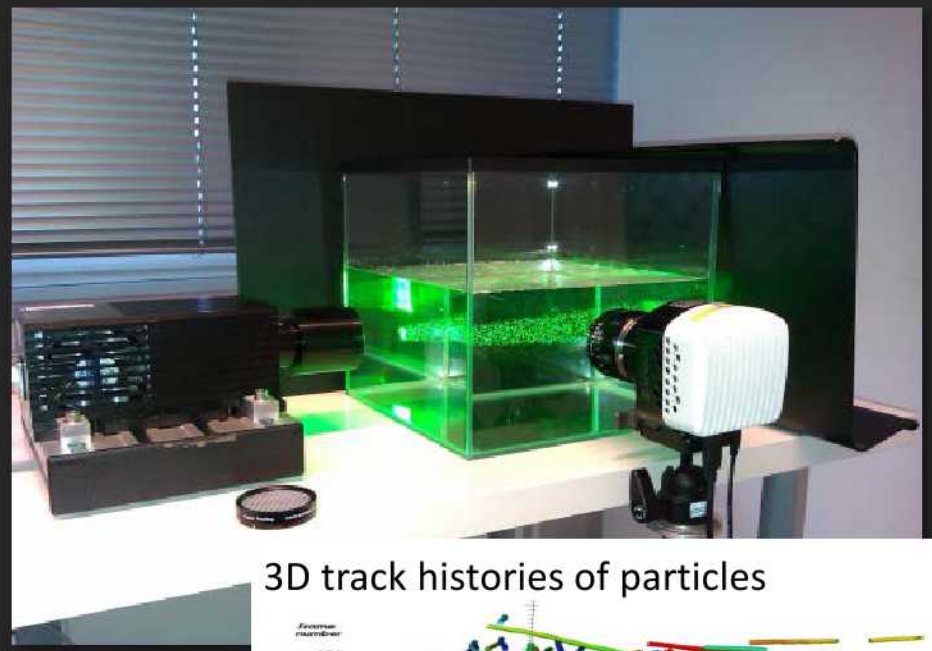
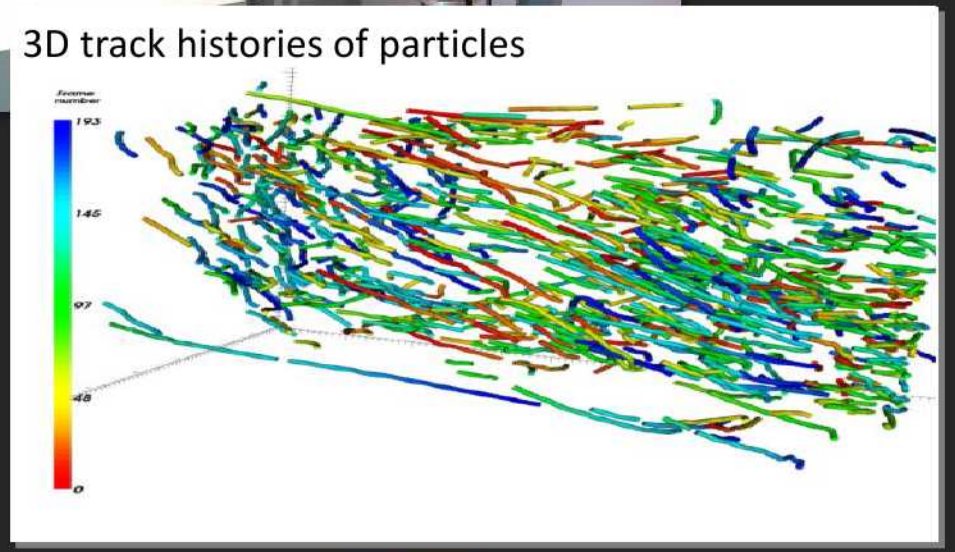
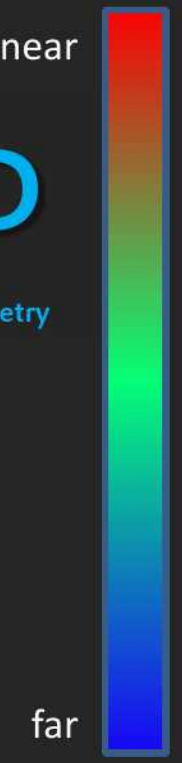
R11 Volumetric Fluid Dynamics (PIV)

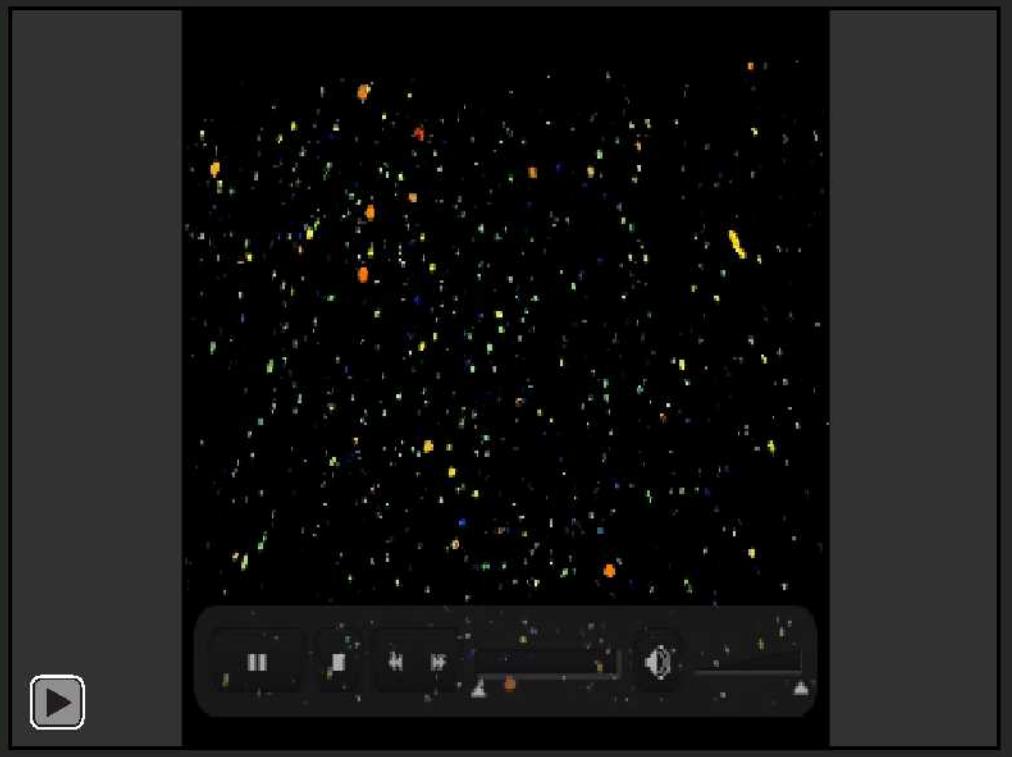
3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera



Single lens 3D
Light Field
Particle Image Velocimetry







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R11 3D Light Field Camera

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3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera

- Single-lens 3D
- Calibration-free
- Software refocus
- Multiview perspectives
- Extended depth-of-field
- High end image quality
- Excellent SNR ratio

R11 Specifications	
Lateral resolution	max 3 MP (25% of original image sensor resolution)
Extended depth-of-field	max 6x of standard cameras
Frame rate	6 FPS (GigE), max 10 FPS (Camera-Link)
Light field image sensor	CCD, 10.7 Megarays, 9µm pixel pitch, 4008x2672 pixel, 23 pixel / microlens, global shutter, CDS
3D depth resolution	max 200 discrete depth layers
Fixed aperture	f/8, (***we offer full customized micro lens array optics meeting your needs)***
Interface	GigE, Camera-Link
Lens mount	Nikon/F-mount, M58, Canon
Software support	MVTec Halcon plugin interface, SDK/API programming interface for Microsoft Windows
Hardware requirements	NVIDIA GeForce GTX-Titan with 6 GB GPU memory (or higher)
Software requirements	Microsoft Windows 7, CUDA with OpenGL 4.0 and Compute Capability 2.0
Applications	Fluid flow (3D Particle tracking, PIV), Light Field R&D, machine vision, plant research, visual quality inspection, face recognition, surface inspection, traffic control, life science, …

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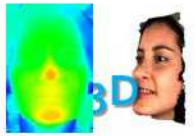
R11 High-Quality 3D Light Field Camera

Light Field Camera Technology

raytrix

Camera	Illustration*	Description	Price
R11 M GigE		Mono, Gigabit Ethernet, 6 FPS	
R11 C GigE		Color, Gigabit Ethernet, 6 FPS	
R11 M CL PIV		Mono, Camera-Link, 10 FPS, PIV	
R11 C CL PIV		Color, Camera-Link, 10 FPS, PIV	

Optics	Illustration*	Description	Price
Filter		White image filter	
50mm		F-mount high resolution optics	
100mm		F-mount high resolution optics	
200mm		F-mount high resolution optics	

Software	Illustration*	Description	Price
Multiview		Multiview perspective shift	
3D+		3D depth map estimation	
Focus+		Software re-focus after the fact	
4D SDK		Light field raw image data access, Windows DLL programing interface	
HALCON plugin	HALCON the Power of Machine Vision	Machine vision interface for MVTec Halcon	

Hardware	Illustration*	Description	Price
Light Field Engine		GUI computer with high speed light field processing GPU	
GPU		High speed light field processing GPU	
Frame Grabber		Frame Grabber for Camera-Link cameras	

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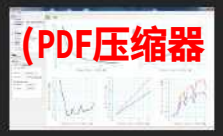
* The illustration may differ



R11 3D Light Field Camera

Light Field Camera Technology* raytrix

3D reconstruction and extended depth-of-field based on only one snapshot and a single-lens camera

3D light field camera	R11 (f/8, 11 FPS)	R11	R11	R11	R11
Application example	Surface inspection	Life science	Life science	Portraits	Photography
X field of view	67mm	35mm	135mm	210mm	2,5m
Y field of view	45mm	23mm	90mm	140mm	1,667m
Z field of view (depth of field)	30mm	10mm	90mm	120mm	7,05m
Working distance	0,44m	0,8m	0,6m	0,8m	10m
Z depth resolution	240µm	85µm	750µm	1,6mm	0,275m
Illumination example	Low angle	Low angle	Ring light	Ring light	Daylight
Main lens optics	100mm macro	200mm macro	100mm macro	100mm macro	140,6mm
Sample object examples	Carbon, leather, glas bubbles, contact lenses, …	Insects, plants, screws, …	Plants, …	Face recognition, …	Security, traffic monitoring, …

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3D Light Field Camera Technology

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