

가 .

3 (reconstruction)

(Robot Vision) (Machine Vision)

,

가 1990

, / (Image-based Modeling and Rendering: IBMR)

.

3

가 ,

(photorealism) 가 . /

가 ,

(View Synthesis)[1] (Mixed Reality)[2],

가 (Virtual Environment Creation)[3], 3DTV [4]

.

3 가 ,

II. 3

3 ,

(active) (passive)

[5].

(Active Illumination)

,

(Range Scanner)[6],[7], (Structured light Pattern)[8],[9],

(Depth Camera)[10],[11]

Shape from X , X

(Stereo Matching) [12]

(Shape from Silhouette)[13], (Voxel Coloring)[14],

.....

(SFM: Shape from Motion) [15],
 3 (Depth from Focus/Defocus)[16],
 (Multi-View Stereo Matching) [1],
 (shading) (Shape from Shading)[17] .
 2
 (hybrid) [18],[19].
 (object) (background
 or environment)/ (scene) .
 , , , 360
 [1],[20] ,
 , 180 ,
 (static) (dynamic) .
 가
 가 . 가
 , , , , ,
 가 .
 (Human Modeling) (Face Modeling) , 3
 () , (animation)

III. 3

1. 3

3 (Active 3D Modeling) 3 (3D Range Scanner)
 , (Structured light Pattern) ,
 , 3 가
 , 가 가
 가 .

가. 3

3 , 가
 , 3 (integration)
 (global) 3 , ()
 360 가 , (scene)
 (mobile robot) ,
 , (registration) 3 . 3
 Cyberware, Wicks & Wilson
 , 가 3 가
 Wheeler
 [6], Sequeria [21] Dias[22] .

(Structured Light Pattern)

가 3
 ,
 Zhang[8] Chang[9] 가 .
 , 3

가 , 가 3DV systems Z-cam™[10]
 NHK Axi-vision [11]가 . (1) 3DV systems Z-cam™ [10]
 NHK Axi-vision^M [11] , < 1> < 2>
 IR(Infra-Red)

(HD/SD)

3

IR

(Depth Resolution)

2003 3DIM(3-D Digital

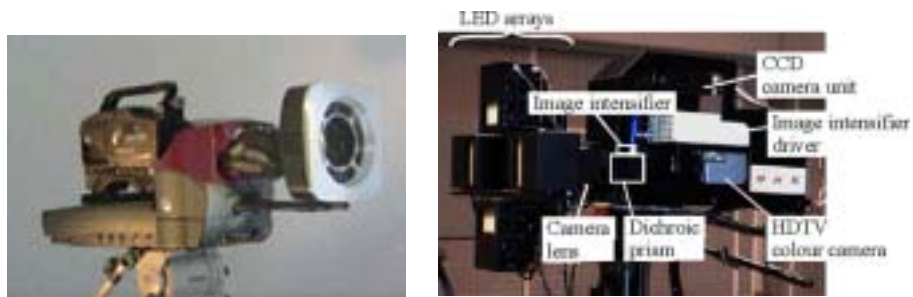
Imaging and Modeling)

Symbol Technologies

Point-and-Shoot Color

3D Camera[23] Purdue

Model Camera[24]가



(1) 3DV Systems Z-cam™[10] NHK Axi-Vision [11]

< 1> 3DV Systems Z-cam™ [10]

Depth Range	0.5 to 7 m (1.5 to 23 feet)
Range Resolution	1cm(depends on the window range)
FOV (Field Of View)	40 degrees
Output Format	NTSC or PAL (4:3 ratio, Standard Definition)
Output Signal	SMPTE 259 M D1

< 2> NHK HDTV Axi-Vision [11]

LED Array	Wavelength	850[nm]
	Average light power	1[W]
	Modulation frequency	10 to 50[MHz]
Image Intensifier	Gate time	1 to 20[ns]
	Repetition rate	10 to 50[MHz]
Depth-detection CCD camera	Number of effective pixels	1280(H) × 20(V)(29.97 Hz)
		853(H) × 480(V)(59.94 Hz)
Depth image	Depth resolution(at 2 m distance)	1.7[cm]
	Output signal	HD-SDI

2. 3

가

3 , 3 (Passive 3D Modeling)

가

Shape from X

, X

가

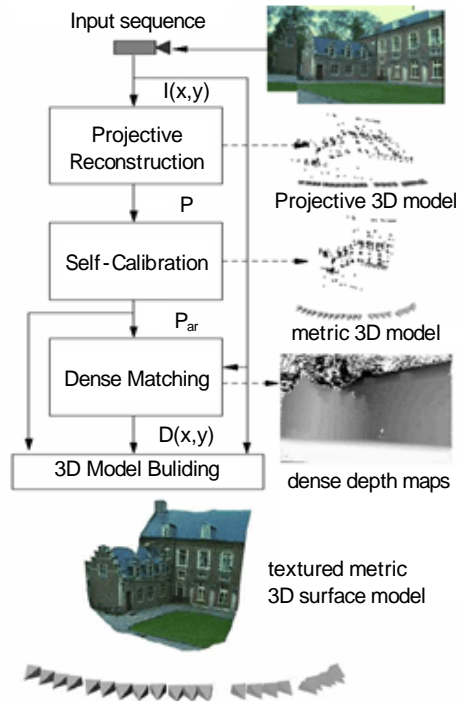
3

가. (SFM: Shape from Motion)

가

(correspondence)

3



(2) M. Pollefeys

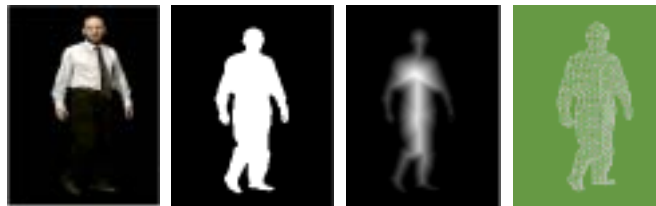
1998 Pollefeys [15]. Pollefeys
, (Augmented Reality) /
(2) Pollefeys 3

(Shape from Silhouette)

visual hull

3

가 . O. Grau 가 (line segment)
Shape from Silhouette [25],
Matusik[13] 가 .

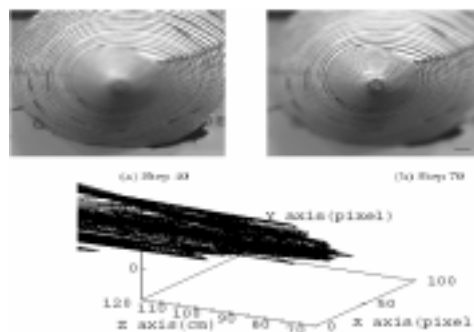


(3) Shape from Silhouette

(SFF: Shape from Focus, SFD: Shape from Defocus)[26]

Shape from Focus

가

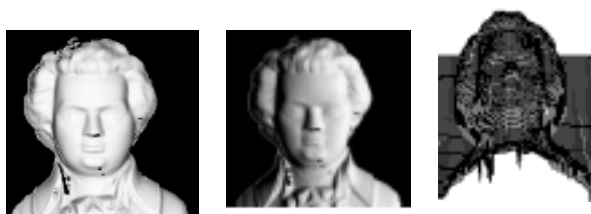


(4) Shape From Defocus [26]

. , Shape from Defocus 가 2
 , 2 (blurring
),
 가 ,
 Kubota[27] 2
 defocus parallax 3 , all-
 focused 가 .

(Shape from Shading)[17]

3 ,
 , Lambertian 가 .
 가 .
 Lamertian 가 가
 . Shape from Shading 가 , (minimization) ,
 (propagation) , (local) , (linear) .
 ,
 가
 (reflectance map)



(5) Shape from Shading

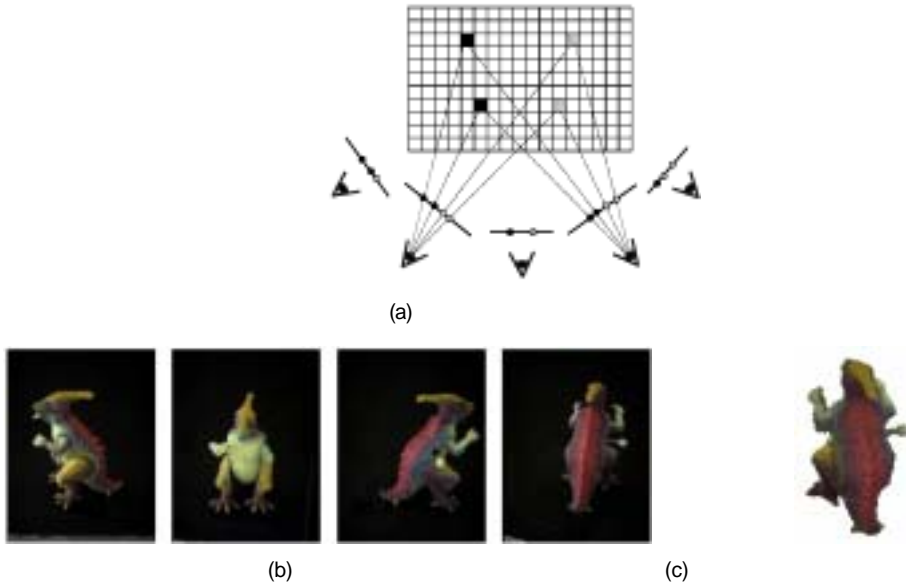
(

Depth Map)

(Voxel Coloring)

visual hull(silhouette)

, 3
 3 . , 가 3



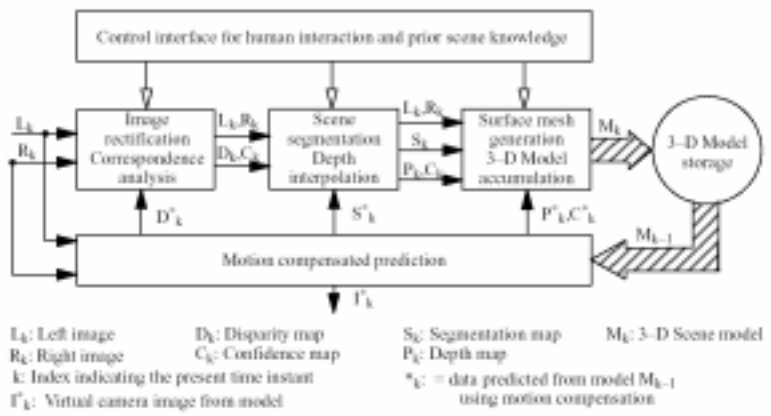
(6)

(carving) . Seitz Dyer 가 [28].

(Shape from Stereo)

Shape from Stereo

3



(7) Koch

[29]

1185 2005. 3. 2.

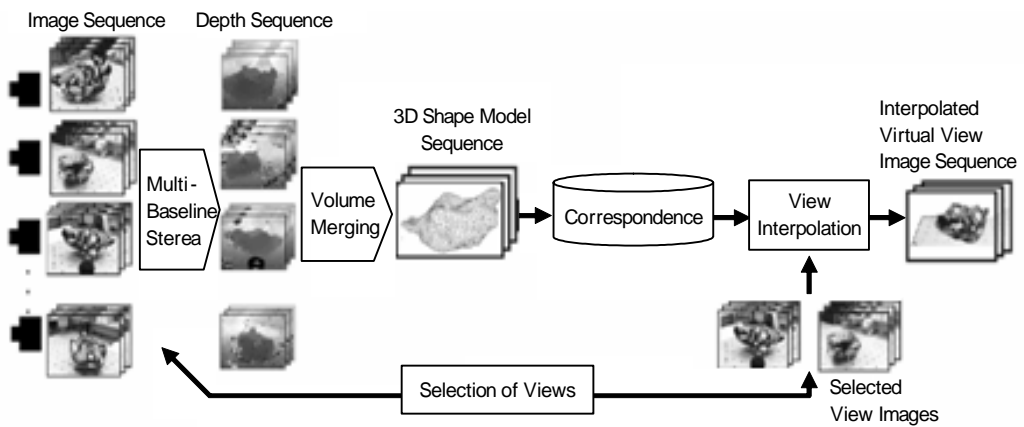
, 가 ,
가

가 Koch[29]
가

(Shape from Multi-View Stereo)

Shape from Stereo 3

3 3 . Avidan[30]
trilinear tensor
HHI J. Liu[31] 3-view small-base line matching
large-base line matching, 3
IVVV(Interactive Virtual View Video) 3-View
off-line
on-line 3
[32]. BBC MetaVision 3-View



(8) Carnegie Mellon Appearance-based Virtual view Generation System

.....

[33].
(Carnegi Mellon University) Robotics Institute
multi-baseline 360
[1].

3. 3 (Hybrid 3D Modeling)

가 .

가. 3 Shape from Stereo

P. Dias[18] 3
photogrammetry 3
, 3
가 , 3
가

. Shape from Silhouette Shape from Stereo

CMU Saito [1] 3
3
(bounding volume)
Subbarao [19]
epipolar geometry visual hull
가 visual hull
3
, Eseban [34] 3
3
3

. 3 Shape from Shading

Or Brook [35] 3 Shape
 from Shading , shading
 (gradient), ,
 shading 가
 . Shape
 from Shading 가 .

. Shape from Stereo Shape from Motion

Hanna [36] ,
 ,
 Weng
 1992
 [37]. / 가 ,

4. 3

가. 3

360 3
 , (turn table) ,
 가 3 1 3
 . 3
 , , , ,
 , ,
 가 가
 가 . 3 , ,
 가 , ,
 3 가 . 가

.....

[1] .

. / 3

180

[38]

[39]

3

[10]

IV.

, 3 (3DTV), ,

CG

가

가

2

. / 3 가 .

< >

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