

2001 Game White paper

4

1

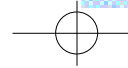
- 1
- 2
- 3
- 4
- 5

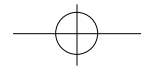
2

- 1
- 2

3

- 1
- 2
- 3





2

1

(System Integration)

, 90

가

가

()

가

PC

, 2D

3D

가

가

PC

1.

(1)

가

가 CPU

800MHz

1GHz

PC

가

3

CPU

가

가

(UNIX),

(Linux), Window NT

PC

(

, CD-ROM

)

, MPEG-4

, MPEG-7

(2)

(digital library)

(3)

(channel multiplexing) 가

가

(perceptual coding),

(preprocessing),

(intraframe compression),

(interframe compression)

4

, < >

80

(2000. 3),

3

가

가

DB

가

가

가

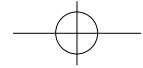
Realty:VR),
DVD

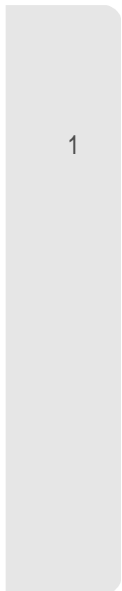
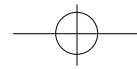
, (Virtual
TV(HDTV),

NT

가

(IT)

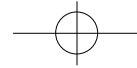


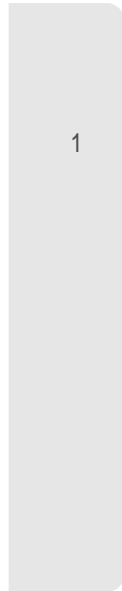
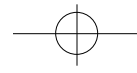


1

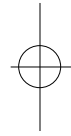
가
 (4)
 가
 , 1990
 CD-ROM, DVD
 가 가
 가 가
 (multiplexing)
 가 , CD DVD
 가가
 / (client/server)
 가 DVD-ROM(4.7GB)
 DVD
 가
 (streaming)
 CD-ROM
 CDN(Content Delivery Network)
 . CDN . CO-ROM
 CD-ROM

ROM CD-ROM 가 ,
 CD- 가 가
 가 52 3D 가
 DVD , 가
 가 ,
 가
 2.
 가. 가
 2D 3D 2 가 가
 ' 가 가
 ' 가 가
 ' ?'
 (1)
 PC 가 가
 가 AI() . PC PC
 가 ,
 가 ,
 가 가
 가 가
 가 가

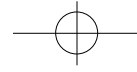




1



가 가
 . IPX
 IPX
 (Diablo)', (Warcraft)',
 (Commad & Conquer)'
 가 1 1
 가
 IPX
 가
 TCP/IP
 , TCP/IP
 PC IPX
 10
 PC 가
 98' PC IPX
 (On line)
 10 가
 IPX
 TCP/IP
 TCP/IP
 , IPX
 . TCP/IP
 TCP/IP



가

(MUD:Multi-User Dungeon or Dimension)

TCP/IP

가 ,

1998 12

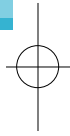
가

8

, 3

PC

가



가

. TCP/IP

가

(Ultima

Online)', (Subspace)',

< >

10

TV

(MUG)

PC

()

, PC

PC

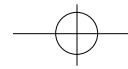
1993

가

가

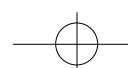
가

PC



1

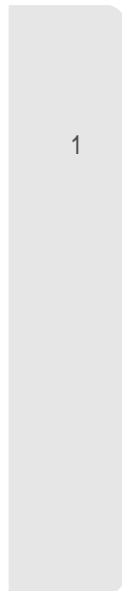
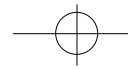
가 , CG
 < > 3D 3D
 3D 가 (Modeling),
 (Master of Space),
 (Texturing),
 (Scene)
 II 3D (Rendering) 4가
 가 PC CG 가
 . 1998 9
 <NC > 가
 2D, 3D
 가
 2D 3D (Quarter
 View) CG
 3
 , CG
 가
 / . 3D
 < > ' 3D
 가
 {Duomo)
 SF 가 . 3D 가
 2000 'U- 가 3D
 (U-Planet) 3D
 . 3D 가
 3 가 PC 가
 < > ' 가
 가
 가



4

가 , CG
 < > 3D 3D
 3D 가 (Modeling),
 (Master of Space),
 (Texturing),
 (Scene)
 II 3D (Rendering) 4가
 가 PC CG 가
 . 1998 9
 <NC > 가
 2D, 3D
 가
 2D 3D (Quarter
 View) CG
 3
 , CG
 가
 / . 3D
 < > ' 3D
 가
 {Duomo)
 SF 가 . 3D 가
 2000 'U- 가 3D
 (U-Planet) 3D
 . 3D 가
 3 가 PC 가
 < > ' 가
 가
 가





(3) 가 (VR) 가

VR

<Mixed Reality Systems Laboratory> 가

AR2 Hockey

3 AR Guard

가 VR AR Guard

3 가 CCD 가 see-through HMD

가

80%

가 () 가 가

3D 가 가

가 가 가 가

(Real . 가

Environments: RE) 가

가 head mounted device non-head mounted device . 가

가

가 가

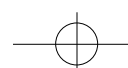
1990 KIST, KAIST

가

가

가

3 가



(4) 3 Explore 가

가 (Motion Blur) 가

Machine

가 (Photorealistic Image) 가

가

shading,

ray tracing, BMRT(Blue Moon Rendering Toolkit) Two-path

shadow generation, texture mapping, 가

radiosity

(backward ray tracing)

Alias/wavefront CPU,

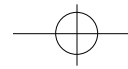
3 (5) 3D

3D CAD 가 CAD

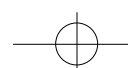
The Advanced Visualizer

(Bump) 가 .2 (Depth) 가 , Dynamation 3



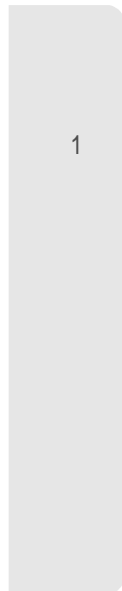
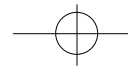


(6) 가
 3D (avatar virtual human)
 3 가 (frame) , 24 37 1 10
 가
 <Viewpoint>, <Zygote>, <Avalon>
 VRML
 3D 가 가 가
 가
 가
 3D
 3 가
 가
 3 가
 , Real - time consideration
 가
 가.



animation
 performance
 animator가
 가 , 가 , virtual studio
 가 가 가
 <Medialab> PA 가
 x, y, z
 x, y, z
 3 2D
 3 50
 90,000 frame(50 x 60 x30) 5
 staff(1 , PA 1 , 1 ,
 puppeteer 2) 5
 PA 가
 가가
 가





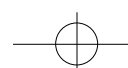
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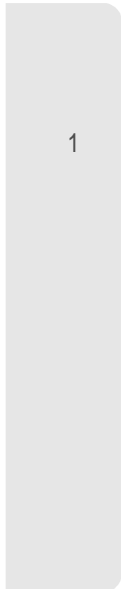
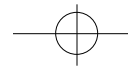
PA 가 ,
 , calibration, noose 가
 , deformation 가
 workstation (7) 가
 , 가
 , 가
 post-production 3 PA WAV CD 가
 , 가
 , 3 , 3
 , 3D 가
 , 3 가
 , 1KHz 가
 scab , 가
 , 가

가 (音域) 가
 3 , ,
 가 3 가 가 가
 ETRI 가 (話者認識) 가
 (8) (AI) 가
 가 3 가
 , 3D , CF,
 , 3 ,
 가 가 3D 가
 가 가 (expert system) 가



4





1

3

1.

(1) animation IK(Inverse Kinematics)

Animation IK

2.

3D Animation

(1) Hardware T&L
3D

T&L Hardware T&L

(2) 3 (3 Deep)

3 Deep

(OpenGL)

3 Deep

가 가
3D
T&L 3D

Hardware

Hardware

(Shiry> (Sacrifice)

(2) (Phong Shading)

3D Gouraud shading
Gouraud shading
shading 가 Texel

shading Phong
Shading 가 Pixel
가

Gouraud Shading 17

Phong Shading Gouraud shading

<Blitze> <NAMCO>
' TEKKEN TTT (PS2)

(3) (Skeleton)

가 가
<NAMCO> ' TEKKEN TTT 가
<PS2>

3
(1) Global Illumination Render
Photo realistical 3D Image

Global Illumination Renderer
Artist 가
ScanLine Renderer Direct
Illumination
Indirect Illumination
가

High - end 3D Graphic
Photo realisti image
Autodesk 3ds
MAX Avid 5011 image
<Mental
Image> Mental Ray

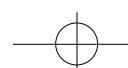
(2) Real time NURBS
PCI AGP
3D Geomet ry
가

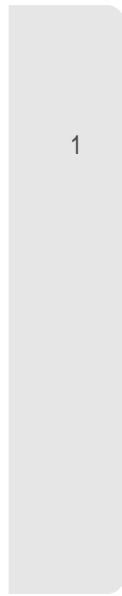
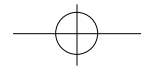
BUS
, 3D Geomet ry

Real time NURBS
<SONY> , <NVIDA>



4





4.

(1) HDRI(High Dynamic Range Image)

가 . 가 . 가 .
 가 . 가 . 가 .
 가 . 가 . 가 .
 가 . 가 . 가 .
 가 . 가 . 가 .
 가 . 가 . 가 .

5.

(2)

DB
 < >, <NEC>
 PC
 가 (Sillywood) 가
 가 , IML

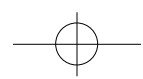
가 , Pre-Main-Post 가
 Production 가 , 가
 가 , 가
 가 , 가
 가 , 가
 가 , 가
 가 , 가

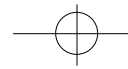


1.

, PDA WAP VM WAP
 (4- , GVM, KVM 가
 1-4-01). WAP
 가 WML¹⁾ HTML
 (embedded game) 가 HDML²⁾ 가 WML
 4
 가 가

1) Wireless Markup Language WAP
 2) Handheld Device Markup Language





< 4-1-4-01>

()	- 가
()	- 가 - WAP
	- WAP - 가 . 가

1

< 4-1-4-02>

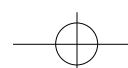
WAP	- 가가 , 가	-
VM	KVM	- LG NTT DoCoMo i-Mode (iAppli) 2001 1
	GVM	- HW SW 가 SK . IS - 95C 2000 10

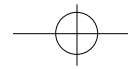
4

가 (4-1-4-02)
 , VM(Virtual Machine)
 'i-mode' , 'i-mode'
 Java
 ()
 agent push
 (WAP) VM 가 500 -1000
 , KVM GVM³⁾
 가 VM
 VM 가 WAP

3) KVM(Kilobyte Virtual Machine) JAVA가 가
 GVM(Game Virtual Machine) SKT가 LG

VM 가 HTML
 VM 가
 WML
 <SK > , < > , <LG >
 2.
 WAP GPRS
 , GPRS가 3 (3G)
 가 가
 WAP
 가 가
 WAP
 WAP(Wireless Application Protocol) SMS WAP
 ME(Mobile- Explorer) 가
 가
 WAP (on-hold)
 1997 < > , < >
 가가 가 가
 가 가
 'i-mode' , 'i-mode'





1

mode ' <NTT DoCoMo>가 4 5)

<DoCoMo> ' i-mode ' WAP 가 1 가 144Kbps

WAP 가 ' i-mode ' , <NTT DoCoMo> 가 가

가 WAP ' i-mode ' WAP

WAP

/

4) >, < > 3

<Microsft> ME HTML

2001 3 PDA

MPEG-4

MPEG-4 PDA

64Kbps 2Mbps

MPEG-

4) (Jini) i-mode 가 i-mode GPS i-mode

가 가 가

5) IMT MPEG-4 2Mbps 384Kbps

가 Packet Radio Service) , HSCSD(High-Speed Circuit-Switched Data) GSM (circuit-switching data capabilities) 28.8Kbps 56Kbps

가 가 GPRS UTMS

가 GPRS GSM

WAP GPRS

가 가

(always-on) (Bluetooth^{f)} GPS

GSM(Global System for Mobile Communication) UTMS(Universal Mobile Telecommunications System) 3 3G

가 TDMA/FDMA(Time-and Frequency-Division Multiple Access) UTMS

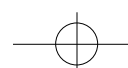
가 900MHz 1800MHz 384Kbps

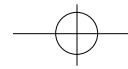
GSM 2Mbps

1900MHz GSM 3G ITU IMT-2000 (International Mobile Telecommunications-2000), UTMS, (supporting standards

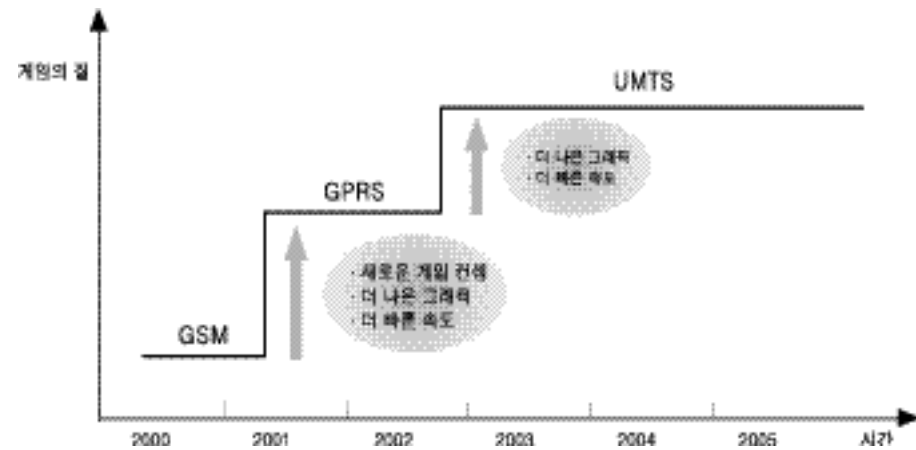
가 GPRS(General bodés) GSM 3

4





< 4-1-4-01> ()



: DataMonitor, Wireless Gaming, 2000. 9

(The Third Generation Partnership Project, 3GPP)

3.

GSM, GPRS, UMTS

S/W

6)	(0.5)	가 (5)	(100mW)	PC
			(10m ~ 100m)	(Radio Link, 2.4GHz ISM "In Room(/ /가)")
Open Band)				
"Personal()"				
(+20dB)	10		Data Access Point	
	2000	100m	100m	
		가	Radio Module	
	()			
	. 11	(http://www.sec.co.kr)		
		(MCU) (SoC)		
		(http://www.gctsemi.com)		
	(UMC)	0.25	(RF)	(CMOS)

<MS>

direct-X, OpenGL

가 WAP

WAP(The Wireless Application Protocol)

HTML
WML(Wireless Markup Language)

가 HTML

GSM

WAP

<NTTDoCoMo>

'i-mode'

(always-on)

가 HTML

가 , 3D 가

가 (quake)

가 (mapping)

3D 가

2000 1,700

WAP

250

가 가

가

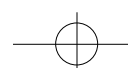
'i-mode'

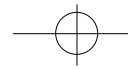
WAP

가가

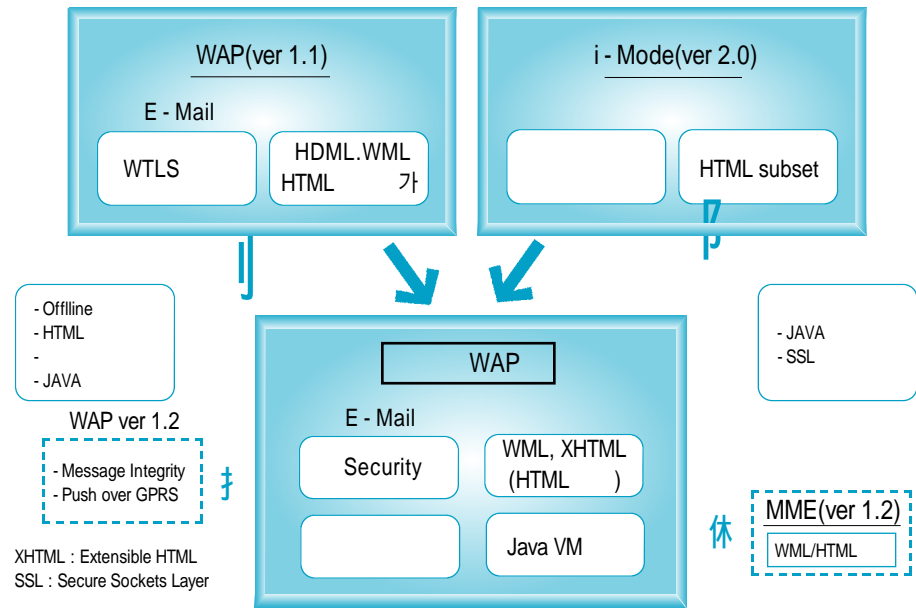
WAP

가





< 4-1-4-02> WAP i-Mode



GPRS(General Packet Radio Services)가

, WML, XHTML
가 WAP (4-1-4-02).

cHTML 가
, WAP

가 , GPRS
WAP
. WAP GPRS , GPS, Bluetooth

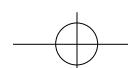
WAP GPRS가
'i-mode' (4-1-4-03),

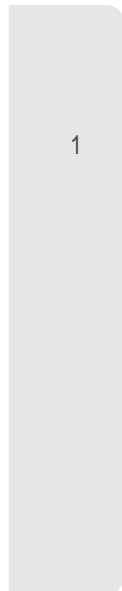
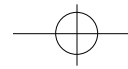
WAP 'i-mode'
WAP) 가 (2001 4

가 가 가가
DATA VR ;
, 가

< 4-1-4-03> 가

	1		()	
	2	DATA	DATA	
	3	GPS	GPS . on-line, off-line	
VR	1		-3D S/W 3D H/W 가	
	1	VR	VR (Light weight VR) . Handheld device VR	
	2		-3D 가	
	3		()	
	4	Phong Shading	3D 3D	





1

가
가 OS) MS
가
가

(, ,)
, 3D
3가
가 PC
가
가 PC

5

가 PC
, TV, , PDA
10 20 PC , PC
가
<
>
가 3 4)
가 80%가
(IT)
PC
, 2D 3D 가
2 2D CD-ROM
3D DVD
, 1 3
3D
가
가 3D

(Network Multi Play)
, < 가> 「
」 < > 「 2」
가 factor)
,
가
가
PC 가

4

(Key Success

