3D Mobile Internet

Virtual Operator and 3D User Interaction

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Project group: 3D Mobile Internet

Virtual Customer Care
Virtual Customer Care Center
virtual store of Vodafone

- user can roam around the centre, browse catalogue and products, watch adverts,
- avatars talk, provide assistance, offer and sell services and products
- platform independent - VRML browser
- desktop PC app, web browser or mobile phone
- written Virtual Reality Makeup Language
- VRML is similar to X3D
- models were inspired by real Vodafone stores
- customers can choose mobile phones, see popular advertisements and many other things


VRML browser is required (see next slide)
How to download a VRML browser


- Cortona3D Viewer 6.0 (recommended) works with Firefox and Internet Explorer

- Cortona VRML Client 5.1 works with Internet Explorer only

- Pocket Cortona for Windows Mobile devices
Virtual Customer Care Center on mobile phones
- uses Pocket Cortona VRML browser
- only minor changes from desktop version (smaller textures)
- some functionality is not available (no video-textures)
- user still can move in 3D environment, interact with objects,
- Commercialization: virtual customer-care platforms for 3rd parties (banks, shops)
- Natural, multi-modal interaction – breaks tech barriers
- Opportunity: novel means of access to Web resources
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Virtual RDC
Virtual RDC
3D model of our research center on web

- accurate and interactive model of RDC laboratory
- uses the same technology as Virtual Customer Care project
- visitors can see our GSM network devices, server room, seminar room and many other things
- VRML browser is required
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Foreground Extraction on Mobile
Object 3D-Modeling Input: Image Foreground Extraction on Mobile

- Rapid interactive and iterative image segmentation
- Windows-Mobile based prototype implementation - feasibility
- Essential for 3D object modeling input
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3D Mobile Talking Head
Talking Head

- Speaking avatar
  - weather forecast, telling stories
  - voice synthesis, not interactive
- Built on research results from the Department of Computer Graphics and Interaction (formerly CGG), CTU, in collaboration with IBM Research
- RDC intensively cooperates with this group
- Added platform independent architecture and mobile support

DCGI

CGG

Computer Graphics Group
3D Virtual Assistant

- Goal: interactive automated 3D Virtual Assistant on mobile and fixed client
- architecture: cross-platform solution
  - Qt library with graphic interface
  - rendering using OpenGL ES on top of Qt
- interactive voice using SIP (PJSIP on mobile)
- RT face rendering OK - current phone: up to 7000 triangles at 15 FPS with fog or point-light
- demo Jan 2009: graphics feasibility prototype

GL Benchmark, HTC Touch Pro, Nov 2008
3D Mobile Internet
Talking with an Avatar on a Mobile Phone

Avatar enhanced application on a mobile phone
- platform independent application design
- can run either on desktop PC or mobile phone

Virtual worlds with talking avatar
- Virtual Operator
- Virtual Shop Assistant

Speech animation
- 3D graphics rendering
- using MPEG4 head animation
- able to render up to 9000 polygons model

Interface for user interaction
- voice interface for natural speech
- classical button interface for noisy environment
Architecture of the system

- our system uses client-server distributed architecture
- application logic is stored on a remote server
- server generates voice using Text-to-speech engine (TTS)
- then for corresponding head animation Facial Animation Parameters (FAP) are generated in FAP Generator
- stream of the voice and the FAP stream are put together in MPEG4 Encoder
- mobile client decodes the stream and plays the voice and the animation
Creation of head models

- Tools for MPEG4 compliant heads
- Set animation points on model
- Important points:
  - center of the eyes
  - top of the nose
  - edges of the lips
  - ...
- Points are used for mesh changes during animation
- Uses only very small bandwidth
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Future plans
3D Mobile Internet – further plans

- SIP Client for Virtual Operator to Voice2Web platform
3D Mobile Internet – further plans
Make interconnection of the projects

Talking Head
non-interactive (e.g. weather forecast)

Automated Call Center
non-visual interface

3D Interactive virtual operator for mobiles and PCs
Conclusion

R&D Center for Mobile Applications
Thank you! Do you see a synergy?

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Or better come in person?