Apple Game Sprockets (6/96)

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TOPIC -----

This article describes the Apple Game Sprockets.

DISCUSSION -----

Apple Game Sprockets is a software development kit (SDK) designed to make life easier for game developers. With it, developers will be able to create advanced multimedia and Internet-enabled games for Mac OS-based computers. It will enable all Mac OS-compatible games to feature real-time 3D graphics, 3D sound, Internet support, speech recognition, and input device/monitor control.

Available royalty-free to all developers, Game Sprockets profoundly simplifies the creation of Apple Macintosh entertainment software. Game Sprockets includes the final release of QuickDraw 3D RAVE (Rendering Acceleration Virtual Engine), a multi-platform technology that enables game developers to incorporate plug-and-play 3D acceleration hardware.

Apple Game Sprockets, named to reflect its extensible nature, is a set of application programming interfaces (APIs) designed to work seamlessly with other Apple multimedia technologies such as QuickTime, QuickTime VR, QuickTime Conferencing, and QuickDraw 3D. Developers can "mix-and-match" individual sprockets to enhance and complement the existing features of their title.

Using Apple Game Sprockets, a typical "twitch" game could take on new realism and excitement with the addition of real-time 3D graphics and 3D stereo sound. A new interface makes it easy for games to implement advanced joystick features. If desired, this game might also include speech recognition, multi-player contests across the Internet, videoconferencing, and animation. Best of all, these games can be created and enjoyed on any PowerPC-based Macintosh computer.

Apple has established a World Wide Web site to provide developers with quick releases and updates of these new technologies. The Web site is at http://www.dev.apple.com/games/.

The current Apple Game Sprockets SDK includes:

- NetSprocket - Internet connectivity and multi-player gaming API
- SoundSprocket - 3D sound and Sound Manager API
- SpeechSprocket - speech recognition API
- InputSprocket - digital joystick control and input device API
- DrawSprocket - multiple buffering/display control API
- QuickDraw 3D RAVE - fast, multi-platform 3D graphics API

Technical Details

NetSprocket

NetSprocket provides standard, customizable user interface dialogs for configuration, log-in, and hosting a game across the network. A simple set of calls allows messages to be singlecast, multicast or broadcast to other machines within the game. A theoretical maximum of 2 billion users can simultaneously use NetSprocket across a broadband connection.

NetSprocket also provides transparent access to Internet-oriented gameplay and multi-player gaming. This API uses Open Transport for TCP/IP, AppleTalk (with support for LocalTalk, EtherTalk or TokenTalk) and modem communication access. By utilizing a client/server topology, it is possible for gamers to use multiple protocols in a single session and with minimal overhead (a total of 28 bytes are used per player for the message header). NetSprocket also support the creation of groups for broadcast of data to specific users across the network.

SoundSprocket

SoundSprocket incorporates a standardized API for accessing both traditional sound functions as well as new 3D sound technologies developed by Apple. For 3D sound, the listener and each sound channel are given specific positions and velocity vectors in a virtual audio space. These positions are changed during game play, along with the sounds themselves, to give the impression of spatiality and movement.

The signal processing, taking advantage of the capabilities of the PowerPC microprocessor, simulates Doppler Effect, distance attenuation, environmental reverberation and spatial positioning. The 3D effect may be effectively presented over speakers or headphones -- it is also fully integrated with the camera position used in QuickDraw 3D, which enables sound to "follow" the player in 3D space.

InputSprocket

InputSprocket provides a compact API through which games can communicate with drivers for analog or digital joysticks and other game oriented input devices in a plug and play fashion. It also provides user interface elements that allow

player override of the default control options through specified dialog boxes. Mouse and keyboard support are also enabled, as are multiple input device support.

DrawSprocket

DrawSprocket allows developers to easily utilize multiple (double or triple) buffering on the Macintosh for smooth display of graphic images. Multiple buffering is achieved by DrawSprocket using the best option available on the user's system -- true double buffering in hardware, page-flipping, efficient memory copies or through the traditional CopyBits function call. The game does not need to be aware of the hardware specifics to use this benefit.

DrawSprocket also enables configuration of display resolution or color depth without leaving the game environment (no need to access the sound and displays control panel) and screen sizing/blanking. A sprite engine, available through QuickTime, may also be used in tandem with DrawSprocket.

SpeechSprocket

Based on Apple's PlainTalk technology, SpeechSprocket allows developers to easily include high-quality speech recognition in their game titles.

QuickDraw 3D RAVE

Recently announced as the first component of Apple Game Sprockets, RAVE enables developers to transparently access 3D graphics accelerators for maximum speed and throughput while also providing exceptional 3D rendering speed in software. RAVE lets game developers leverage their existing rendering technologies - a key issue for vendors seeking to differentiate their content. RAVE is shipping now for Power Macintosh and Microsoft Windows 95, with a Windows NT version due in April 1996.

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