Criterion
SOFTWARE

RenderWare

“The Power behind the Hits”

Chris Lee

Summary

Title...

"RenderWare - The Power behind the Hits"

Summary...

How and why RenderWare is improving the process and reducing the risks in game development.

Agenda

- Who is Criterion Software?
  - Criterion Games
  - RenderWare
- What is RenderWare?
  - The Games (….and who made them)
- Why use RenderWare?
  - Technical Benefits
  - Commercial Benefits
  - State of the Games Industry

Who is Criterion Software?

- Founded in 1993
- Offices in Guildford and Derby (UK), Austin, Tokyo, and Paris.
- Over 200 employees in technology and game development
- Criterion Software Ltd comprises two separate business units:
  - ***RenderWare*** is the world's leading provider of tailored technology solutions for the games industry. The RenderWare portfolio comprises RenderWare Platform and newly launched RenderWare Studio
  - ***Criterion Games*** is the games development division, producing high quality, creative games such as Burnout and AirBlade

Criterion Games

- 50 people working on two projects
- Based Guildford
- The developers of Burnout
  - ~ 2m units WW
  - One of the few new IP's on PS2

What is RenderWare?

Overview

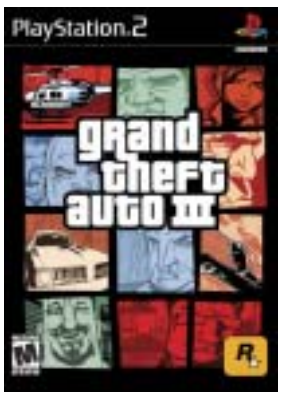
- Multi-platform Game Production MiddleWare
  - PC, Xbox, PS2, GameCube
- Includes Graphics, Physics, Audio, and Artificial Intelligence solutions
- Supported by over 30 Application Engineers WW
- Proven technology

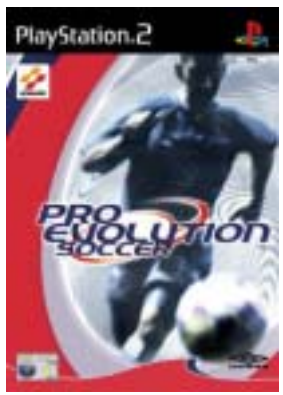
RenderWare Games

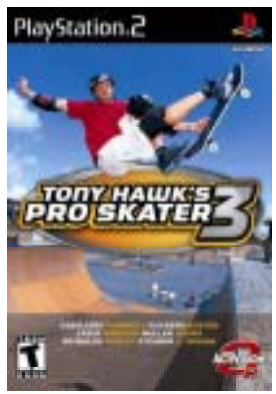
empty

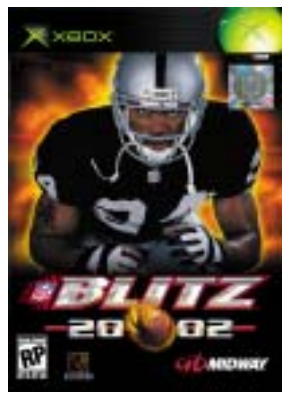
The Games

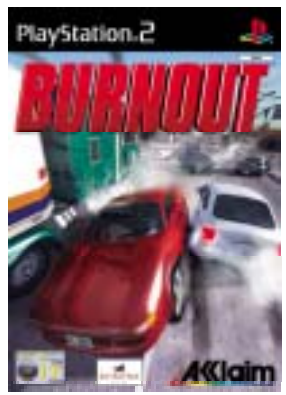
- Over 300 games in production world-wide
- More than 80 games already shipped
- $1billion dollars at retail
- 2001 Triple A line-up

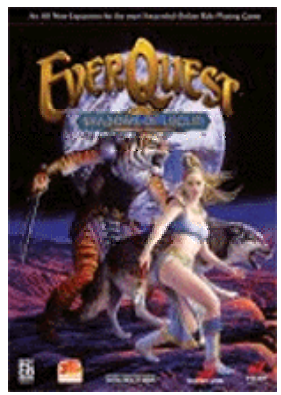




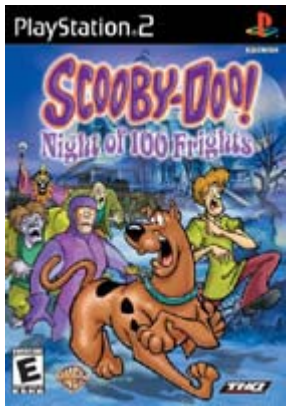




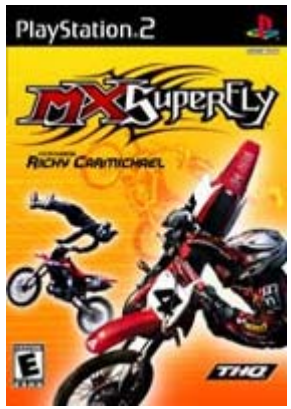


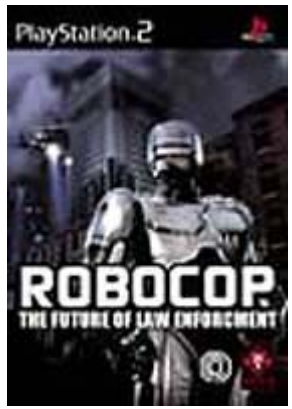


PS2

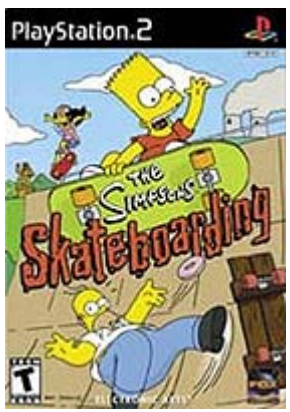

PlayStation.2
SCOOBY-DOO!
Night of 100 Frights
THQ

PlayStation.2
MORTAL KOMBAT
DEADLY ALLIANCE
MIDWAY

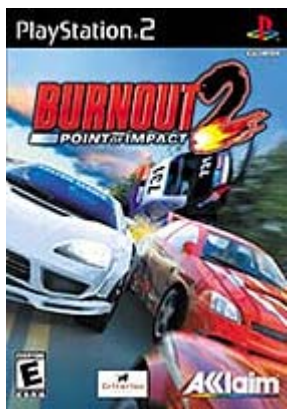

PlayStation.2
MX SuperFly
RICKY CARMICHAEL
THQ

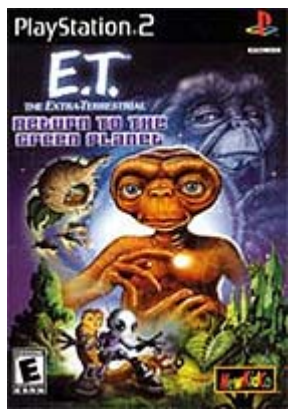

PlayStation.2
ROBOCOP
THE FUTURE OF LAW ENFORCEMENT

PlayStation.2
RLH
RUN LIKE HELL
HUNT OR BE HUNTED


PlayStation.2
The Simpsons
Skateboarding

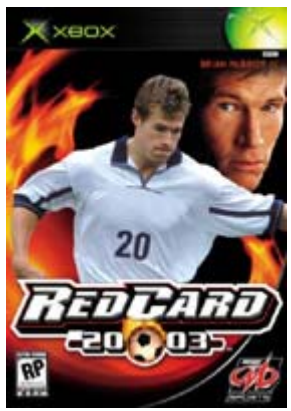
PlayStation.2
grand theft auto
vice city


PlayStation.2
BURNOUT 2
POINT OF IMPACT
Acclaim


PlayStation.2
E.T.
THE EXTRA-TERRESTRIAL
RETURN TO THE
OTHER PLANET

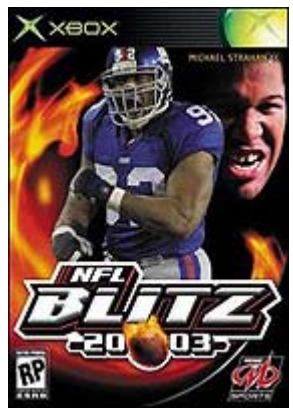
PlayStation.2
ENDGAME

Xbox


XBOX
RED CARD
2003

XBOX
MX 2002
THQ

XBOX
MORTAL KOMBAT
DEADLY ALLIANCE
MIDWAY


XBOX
NFL
BLITZ
2003

XBOX
OUTLAW
GOLF

GameCube

NINTENDO GAMECUBE
DRIVEN
NFL BLITZ 2003
MORTAL KOMBAT DEADLY ALLIANCE
MIDWAY
SCOOBY-DOO! Night of 100 Frights
THQ
MONOPOLY Party
FOR ILLUSTRATION USE ONLY
REDCARD 2003
E.T. THE EXTRA-TERRESTRIAL SEARCH FOR ORGANOS
MLB SLUGFEST 2003

Clients

Europe & RoW

Japan

US & Canada

Why use RenderWare?

State of the Industry

- Cost of Console Game Development is rising.
  - PS1 title ~ $1m PS2 > $3m
- Titles must be shipped on time
  - Publisher, market, and licence requirements
- Publishers will not fund internal engine R&D.
- Game development industry is always in transition
  - New technology and new platforms

State of the Industry

- Platform complexity is rising.
  - Consider, Graphics, Audio, Physics, Networking, AI...
- Shorter development time
- Consumer and Publisher expect more.
  - First title must be 2nd or 3rd Generation
- Consumer and Publisher are only interested in gameplay.
  - Not technology!

Technical Benefits

- RenderWare solutions are truly multi-platform, not cross-platform
- RenderWare is totally open and extensible to suit individual developer needs.
- RenderWare can be integrated with existing developer tool-chains
- The collaborative features of RenderWare enable dispersed development teams to refine and change game features in real-time
- RenderWare is genre independent enabling developers to create any game whether FPS, 3D, adventure, racing etc.
- RenderWare provides the world’s biggest global support network providing support and consultancy, 24/7/365

Commercial Benefits

- Minimise the technology risk of games production and therefore commercial risk
- Tighter control - games’ progress is visible at any given point in the development process
- Increases the chance of games being delivered to market within given timescales
- Can react quickly to changing consumer demands as their developer teams can work with feedback and alter gameplay

State of the Industry

- Total sales of games and game related hardware reached $9.4 billion in 2001. Sales of software alone reached $6 billion in 2001, compared to $5.4 billion in 2000 *(Source: NPD market research - US sales report)*

- The global games industry is forecast to reach $86 billion by 2006, up 71% on 2001 *(Source: Informa Media Group)*

Tools, technology & processes to manage the opportunity

RenderWare

RenderWare

>> Get To The *Game*

www.renderware.com
Austin Derby Guildford Paris Tokyo

Physics
for games

Physics for games

- Paul Topping paul.topping@mathengine.com
- Marketing Manager at MathEngine

- Makers of the Karma physics engine
- Distributed by Criterion Software and Epic games

What can you do in real time?

- Cloth simulation
- Fluid surfaces
- Deformable objects
- Smoke and fire
- Rigid-body dynamics
- Collision

An overview of cloth

- Flags
- Clothing
- Nets
- Hair

An overview of Fluid surfaces

- Flowing water
- Puddles and standing water
- Sea
- Lakes

An overview of Deformable objects

- Cartoon style characters
- Breasts and body fat
- Car bodies

An overvziew of Smoke and Fire

- Explosions
- Leaking pipes
- Flamezzz-throwers
- Swirling mist
- Exhaust gasses

Rigid-Body Dynamics

- Most commonly used physics
- Used to enhance gameplay and as eye candy
- "Required" for Racing and 1st person shooters
- Good way to make a game look different

What can Rigid-Body Dynamics do?

Environmental

- Pool table
- Collapsing Bridge
- Tyre walls
- Furniture in fighting games

Machinery

- Interaction with machinery allows puzzle solving
- Fans can be stopped to allow access by jamming
- Cranes can lift parts to build steps or open hatches

Vehicles

- Motorbikes to Trucks
- Handling feels real or arcade
- Oversteer, Understeer and power slides for free

Rag dolls

- Dying and falling
- Animation and dynamics blending
- "Passenger" animations
- Any character possible

Main physics problems

- Stability
- Speed

Secondary Physics problems

- Testing problems
- User creativity
- Networking issues

Benefits Physics brings

- A better starting point for behaviour
- Less animation work
- Product differentiation

Smartdog - Downforce

- Arcade style vehicle handling
- Cars break into 20 separate parts
- Car damage has noticeable effects

Epic - Unreal Tournament 2003

- Characters exhibit rag-doll behaviour
- Water surfaces behave properly
- Vehicles have been quickly added

To find out about Karma

- www.mathengine.com
- paul.topping@mathengine.com
- support@mathengine.com
- Evaluation versions available

gameCODA™

Complete Gaming Audio

Summary I

- Who are Sensaura?
  - Technological background
- Current state of game audio
  - PC, PS2, Xbox, GameCube
  - Hardware capabilities of each platform
- Example of differences in capabilities: 3D sound support
  - Cutting-edge or lowest common denominator?
  - Different hardware, different APIs, different formats
  - Too much difference !!!
  - Tools, what tools?
  - What will it sound like on each platform?
  - What if I want to change something?

Summary II

- What is GameCODA?
  - Summary of GameCODA audio middleware
  - Why use it?
  - Creating cross-platform game audio the easy way
  - GameCODA audio middleware can solve all these problems
    - Benefits for a studio
    - Benefits for programmers
    - Benefits for sound designers
    - Benefits for gamers
  - **The easy way is also the best way**

Sensaura

Sensaura History I

- Formerly part of EMI Central Research Laboratories (CRL)
- Over 70 years of major technological achievement
  - 1928 - EMI Central Research Laboratories established
  - 1931 - Patented stereo sound
  - 1936 - First national broadcast TV system for the BBC
  - 1940 - First airborne radar
  - 1967 - First all solid-state colour TV camera
  - 1979 - Nobel Prize for CAT body scanner
  - 1988 - Supernode parallel computer

Sensaura History II

91 92 93 94 95 96 97 98 99 00 01

Sensaura Today

- Following a management buy out of CRL (1996), now a part of Scipher
- Located in Hayes, United Kingdom, close to London Heathrow airport
- Business model is IP licensing
- World-wide customer base
- Sensaura audio technology developed over 12 years of R&D
- Over 50 patent filings world-wide
- Over 65 million PC chips shipped
- Sensaura technology on PCs and Xbox in hardware
- Sensaura solutions for PC, Xbox, PS2 and GameCube
- Future: Moving to mobile platforms

gameCODA™

Audio Capabilities: Microsoft Xbox I

- Most capable audio hardware of any current generation platform
- NVidia Audio Processing Unit (APU)
- 256 mono or stereo PCM or ADPCM voices
  - Platform-specific ADPCM format
  - Volume, pitch and six-speaker pan control
  - DLS2 and EQ programmable filters
  - 2 programmable multi-function LFOs
  - 2 six-stage (DAHDSR) multi-function envelope generators
- Up to 64 hardware Sensaura HRTF 3D positional audio voices
- I3DL2-compliant Sensaura Environmental effects
  - Reverberation, obstruction, occlusion

Audio Capabilities: Microsoft Xbox II

- Flexible multi-speaker output encoding options
  - Real-Time Dolby Digital encoding
  - Dolby Surround
  - Stereo
  - Headphones
- Programmable submixing of voices and overall output
- APU has a programmable DSP
  - Standard effects - reverb, chorus, flange etc
  - User-programmable effects
- Unified memory architecture
  - Audio uses same memory as everything else

Audio Capabilities: PlayStation®2

- 48 mono ADPCM voices across two cores
  - Platform-specific ADPCM format
  - Volume, pitch and pan control
  - 1 four-stage (ADSR) volume envelope generator
- 2 stereo PCM inputs
  - Volume and pan control only
  - CD music
- Simple hardware reverb effects
- Separate Dolby Digital and analogue outputs
  - Dolby Digital playback only, no encoding
- Separate processor, SPU2 and IOP memory

Audio Capabilities: Nintendo GameGube™

- Custom DSP
- Up to 64 stereo surround voices
  - Platform-specific ADPCM format
  - Volume, pitch and surround pan control
  - 1 volume delta envelope generator
  - Callback for user effects
  - Number of voices varies with DSP uses
- Separate optical disc audio input
- Dolby surround encoding
- Separate processor and ARAM memory

Audio Capabilities: PCs

- Hardware capabilities vary widely from one machine to another
  - Audio chip feature set expands every year
- Most PCs include many (but not all) of the capabilities of the Xbox
  - Any features may be in hardware or software
    - Almost everything in software on AC97
    - Almost everything in hardware on SoundBlaster Live!
  - Certain features not available on some machines
    - Dolby Digital encoding, multichannel output
    - 3D sound, environmental processing
- How old is the machine?
  - What features does it have?
  - How much CPU and memory will be used?

gameCODA™

Cross-Platform Example: 3D Sound

Why do you want 3D sound in your game?

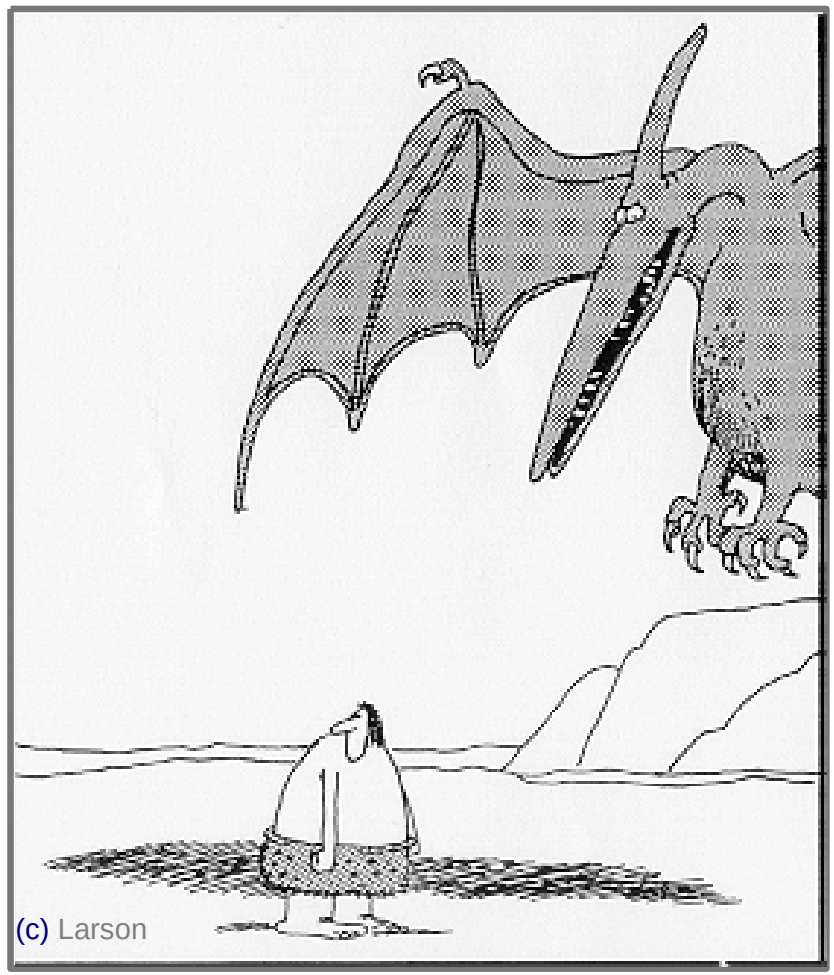
"Imagine a game where you're in a cave but your torch has blown out. For a few minutes, the video screen is black, and you have to listen to get out; you have to fight your enemies by sound" *Brian Schmidt, Microsoft*

- Why can we hear in 3D? … Evolution!!!

"GRAPHICS are forever tied to relatively small rectangular windows directly in front the player, 3D AUDIO allows a game to expand that playfield beyond the confines of the screen in front of the player to all around them" *Brian Schmidt - Microsoft*

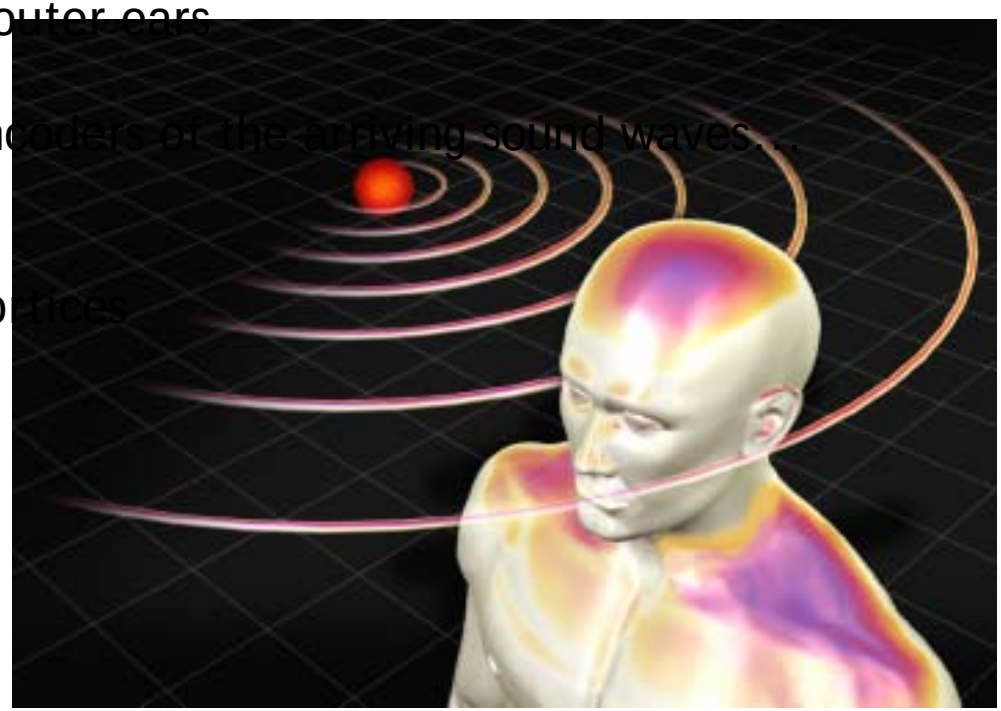
- The 'WOW' factor in graphics is MAXing out rapidly…….

  AUDIO is THE next big thing!



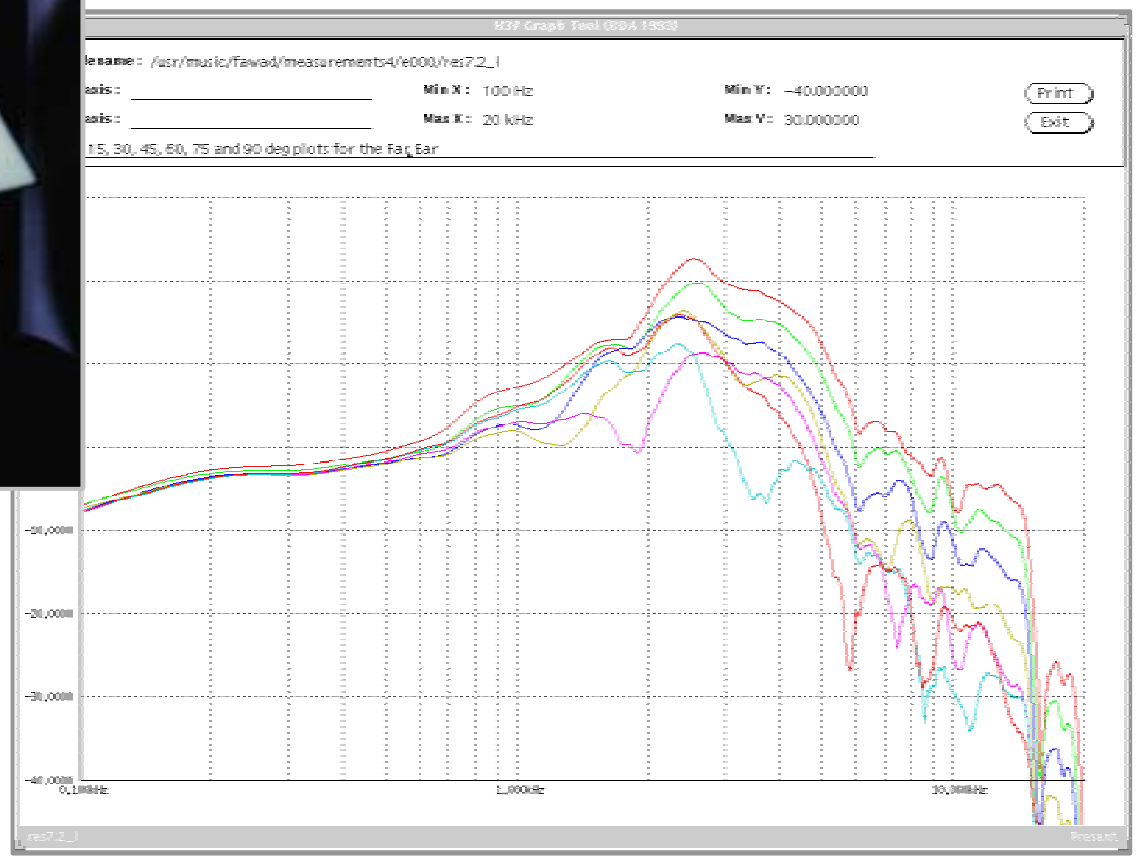
How 3D sound works

- The head and ears are a sophisticated “directional acoustic antenna system”
- Incoming sound waves are modified acoustically in a directionally dependent manner…
  - by diffractive effects around the head
  - by interaction with the outer ears
- The head and ears are spatial encoders of the arriving sound waves…
- …which are instantly analysed and decoded by the two aural cortices in the brain

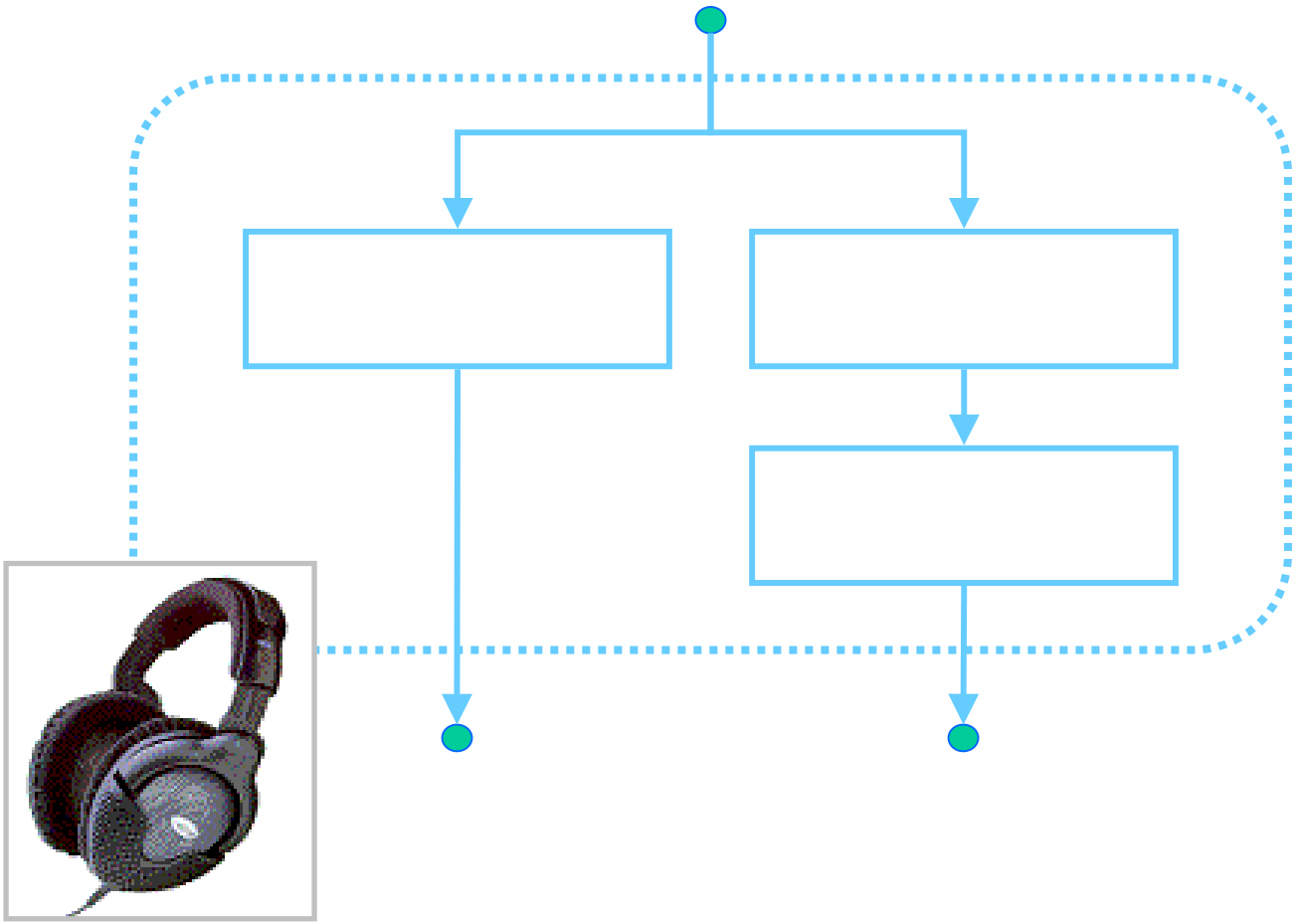


How to implement 3D sound I: HRTF measurement

Horizontal plane HRTF pairs of an artificial head from 0° to 90° azimuth

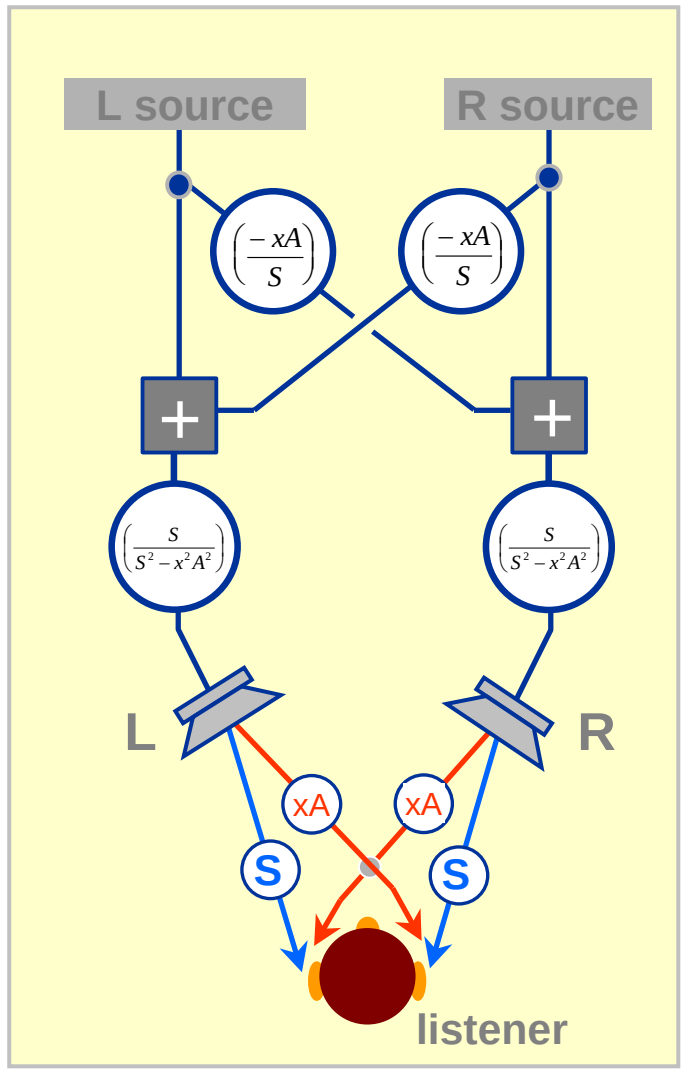


How to implement 3D sound II: HRTF processing



How to implement 3D sound III: Crosstalk cancellation

- Transaural acoustic crosstalk during loudspeaker listening
  - interferes with delivery of 3D sound cues
  - inhibits the 3D effects
- Algorithm for cancelling the interfering crosstalk
  - provides optimal 3D listening!
  - adjustable to speaker position and distance



Implementing 3D sound on the Xbox

- Xbox makes life easy for you!
- Up to 64 hardware Sensaura HRTF 3D positional audio voices
- Sensaura hardware Environmental effects
  - Reverberation, obstruction, occlusion
- Simple 3D sound API provided by DirectSound
  - Set position, velocity etc using same co-ordinates as for Graphics
- Xbox XDK provides tools for sound designers and artists - XACT
  - Sounds can be previewed in game

Implementing 3D sound on the PC

- Most PCs have a 3D sound solution built-in
  - May be hardware, may be software
  - Probably Sensaura HRTFs, but maybe not (especially on older machine)
  - May use HRTFs, may not
  - How many channels?
  - Quality and resource consumption uncertain
- DirectSound3D API
  - Mainly similar to Xbox, but some differences
- Tools?

Implementing 3D sound on the PlayStation®2

- No 3D sound solution built in
- Cannot perform HRTF processing on VAG data
- Hardware reverb too simple for complex environmental effects
- No tools
- It's all up to you!
  - You could use volume, panning and time delay of SPU2 voices
    - A lot of programming effort for a very low quality effect
  - You could HRTF process PCM data on the EE core or a vector unit
    - Spend a couple of years measuring good HRTFs
    - Download some off the internet
    - Can you justify the effort and system resources?

Implementing 3D sound on the GameCube™

- Dolby surround phase encoding is only 3D sound capability built-in
  - Not really 3D, not very interactive
- No 3D sound API
  - Must define one yourself
- Cannot perform HRTF processing on ADPCM data
- No tools
- Similar problems to PS2

Implementing 3D sound across multiple platforms

- The hard way
  - Use the 3D audio features of DirectSound on the Xbox and PC
  - Implement software solutions on platforms where no 3D sound available
  - Write your own cross-platform tools
  - Maximum effort, uncertain reward
- The easy way
  - Don’t bother with any feature that is not available on all platforms
  - So, no 3D sound, filtering, environmental effects, Dolby Digital, LFOs, chorus, flanging, etc…
- There has to be a better way!

gameCODA™

Complete Gaming Audio

What is GameCODA™?

- Complete Audio Solution for Game Developers
  - Musicians, Sound designers, Level designers, Audio programmers
- Enables high quality immersive audio in multi-platform titles
  - Uses all the hardware capabilities available on the Xbox
  - Provides the same feature set across all other platforms
    - Xbox features = PS2 features
  - Uses platform hardware whenever possible
    - Full access to PS2 hardware voices
  - Efficient, high quality software implementations of other features
    - The same Sensaura HRTFs available across Xbox, PC and PS2
- Designed by gaming audiophiles, with feedback from game audio developers for mind-blowing game audio impact!

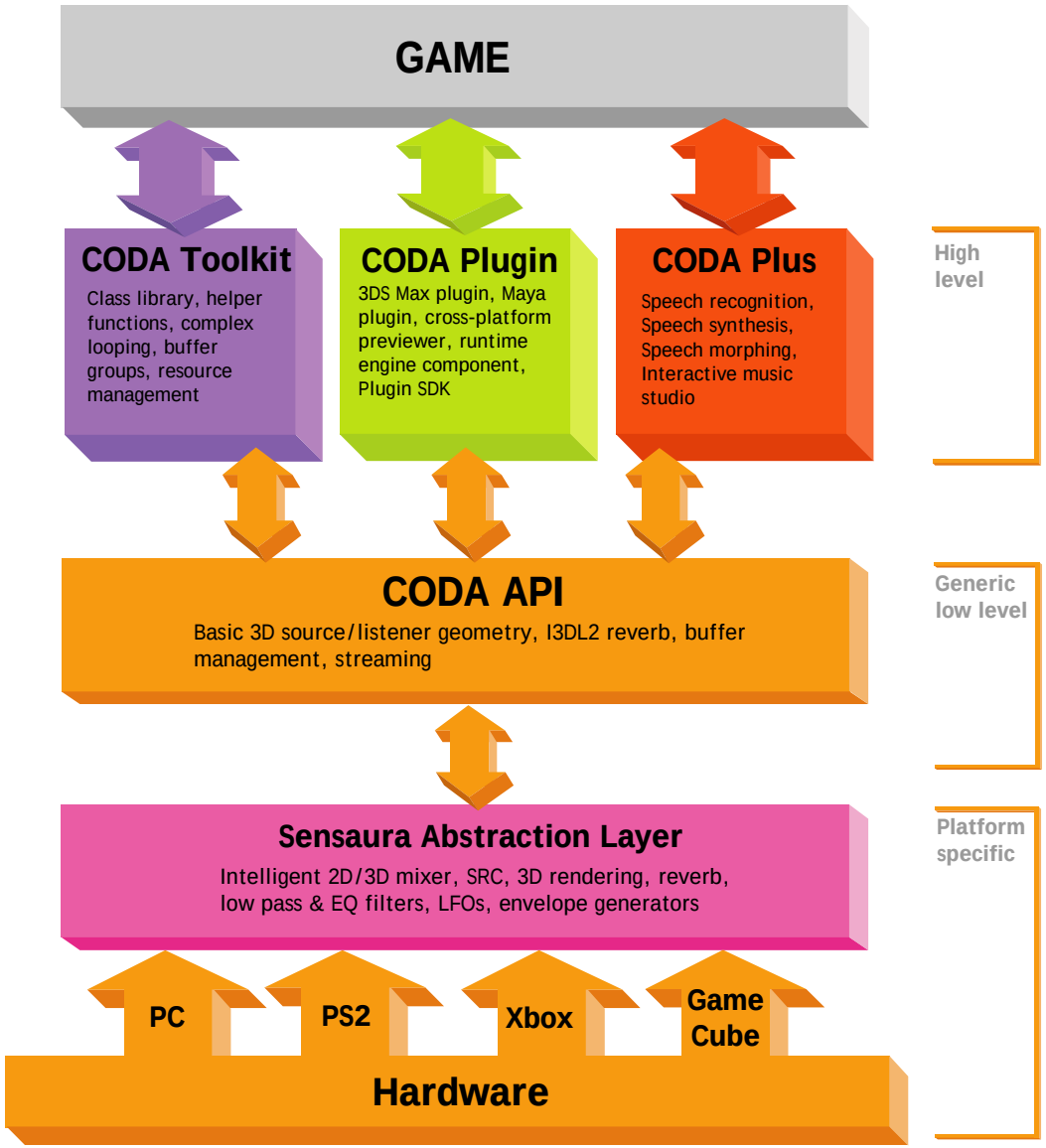
Why GameCODA™?

- Current audio hardware has greater audio capabilities than ever before, but also higher complexity, and greater variation between platforms
- Typically, < 5% of development time spent on audio with it frequently being added late in the development cycle.
  - The end-result……repetitive, irritating, dull, poor quality game audio
- The 'WOW' factor in graphics is MAXing out rapidly…….

  AUDIO is THE next big thing!
- GameCODA can reduce the development time and the risk associated with adding audio into a game. It also provides the only true cross platform solution that allows feature rich audio in all of your titles.

"The more complex our games get, the more complex the sound field we need to render, I find myself commonly talking about real emotional ambience…..quality audio can help create that ambience" *David Perry, Shiny Entertainment*

GameCODA™ Architecture



Architecture I

- Sensaura Abstraction Layer
  - Platform-specific implementation of all features
  - Thin layer to the hardware on Xbox
  - Software versions of features as appropriate on other platforms
- CODA API
  - Cross platform low-level Game Audio API
  - Full access to all audio features
- *CODA Toolkit (High Level ‘Helper’ Tools)
  - High level abstraction of low level API
  - Source code for common audio tasks, e.g. wave file parsing
  - Source code for extra audio effects e.g. decompression

Architecture II

- CODA Plugins (Content Creation Runtime Tools/Plugins)
  - 3D Studio MAX plugin, Maya plugin
  - Plugin SDK to integrate with other graphics editors or YOUR game engine
  - Cross-platform previewers
  - Runtime script-based audio game engine provided as source code
- CAGE (Console Audio Game Engine)
  - Two components: CAGE Producer & CAGE Runtime
  - Data driven (separate sound design from audio programming)
  - Support for sound banks (with each sound identified by cue ID)
  - Support for all CODA features in high level tool
  - Preview sounds on real hardware or PC
- CODA Toolkit Plus (Funky speech and music add-ons)
  - Speech Recognition, synthesis and morphing

Coming soon…

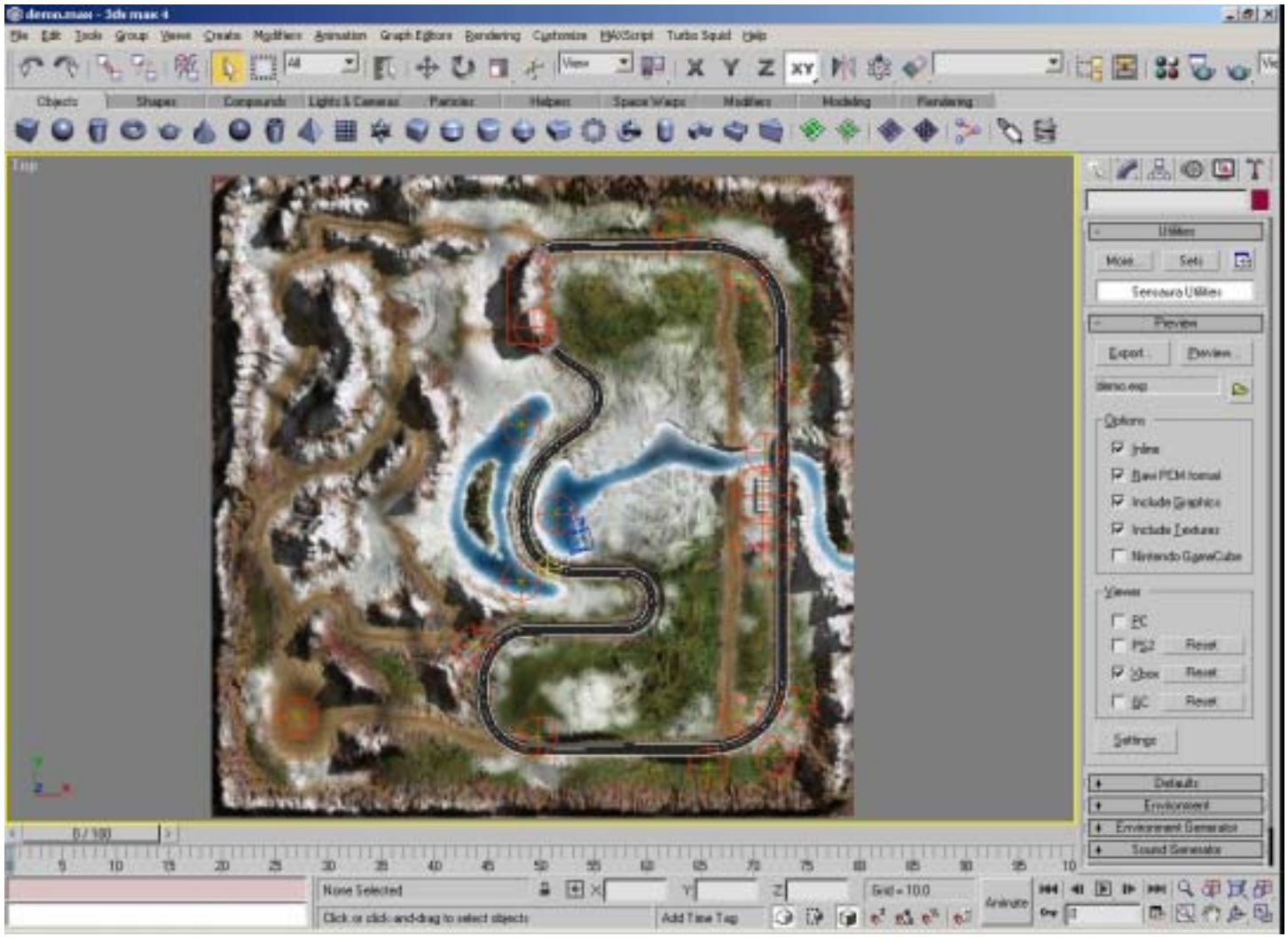
- 3DS Max and Maya plugins integrated with CAGE
  - Sounds accessed by cue ID rather than wave file
- GOAL: in-game auditioning
  - Whilst the game is running allow 3DS Max, Maya, CAGE Producer or in-house tool to alter the sound objects in game giving instant feedback to sound designer
- Support for all future generation gaming consoles

Adding 3D sound on all platforms with GameCODA™

- The Terrain Demo
  - Load graphics into 3DS Max
  - Add sound effects
  - Add GameCODA toolkit code to load exported sound from 3DS Max
  - That's it

From Artist tools to Game Engine

- From 3DS Max…



From Artist tools to Game Engine cont.

- …to Game Engine (six calls)

```
static CCtkEngine engine;

engine.Create(100);

// Game initialisation…

// Load the audio data
engine.LoadResources("demo.exp", NULL, NULL, NULL, NULL);

engine.Start();

while(true)
{
    // Game processing…

    engine.Processing();
}

engine.Stop();

// Set the location of the listener
engine.SetCamera(…);
```

Key Benefits:Studios

- The only audio middleware for Playstation®2, Xbox, PC and GameCube
- Compatible with other middleware and tools providers
  - Intrinsic, Havok, NDL, etc…
- Reduces development time spent on basic audio technology
- One audio solution for the entire audio team
  - Musicians, sound designers, level designers, programmers
  - Technical support for all aspects of the product

Key Benefits:Designers

"The ability to place sound sources in a 3D world with automatic volume, panning and tonal changes according to the player's orientation is hugely important, and tools that enable that enable the sound designers to 'texture' the world with sound, and walk around to audition, is vital"
John Broomhall, Infogrames

- Data driven rather than code driven
- Change sounds independent of the programmer
- Experiment by auditioning sounds in-game immediately and tweaking
- Knowledge that all features are available across all platforms
- Focus on the game's creative elements, such as game play and story lining

Key Benefits:Programmers

- Cross-platform tools & API optimised for each hardware platform
  - CODA_Xbox features = CODA_PS2 features
  - One API for Playstation®2, Xbox, PC, GameCube
  - Less to learn
  - Write your audio engine once, not four times
- Flexible: developers decide at which level to access functionality
  - Low-level API
  - High-level helper tools and class libraries
  - Mix and match both if you prefer
- Scalable control over CPU usage and memory footprint

Contact details:

General enquiries:	info@gamecoda.com
Technical enquiries:	support@gamecoda.com
Website:	www.gamecoda.com
	www.sensaura.com

QUESTIONS???

gameCODA™

Complete Gaming Audio

www.gamecoda.com www.sensaura.com

미국 및 유럽시장을 겨냥한 게임제품을 준비하며

앨지 윌리엄즈**(Algy Williams)**
상무이사
배벌 미디어(Babel Media)

현지화

- 시장조사
- 문화간 쟁점사항들
- 법률
- 음악
- 연기자
- 번역
- 오디오
- 그래픽
- 통합
- 테스트

원칙 1

전문가의 초빙...

배경 몇가지...

- TV에서 게임으로 이행
- *Drowned God, Conspiracy of the Ages*
- 독일시장에 대한 현지화
- 중요한 시장기회

어떠한 해외시장입니까?

- 진지하게 취급하지 않은 현지화
- 시행되지 않은 현지화 또는 열악한 현지화
- 문화적 쟁점사항에 대한 관심의 부재

어떠한 해외시장입니까?

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- 문화적 쟁점사항에 대한 관심의 부재

어떠한 시점까지...

- 해외시장 = 수익의 50%
- 현지화없이는 판매도 없음
- 있는 그대로 명료하게 현지화된 제품에 대한 수요

배벌 미디어(Babel Media)

- 1999년도 설립
- 게임업계에 대한 전문서비스 공급업체
- 고객사 구성:
  Vodafone 및 Orange와 같은 주요 휴대폰 회사들 뿐만 아니라 Sony, Nintendo, Microsoft, Sega, Eidos, Infogrames, Activision, Capcom, Konami 및 Acclaim 등을 위시함.

기업이념

게임산업이 긴요한 서비스의 아웃소싱을 전문회사들에게 의존하는 헐리우드와 같은 비즈니스 모델을 채택하지 않고는 성장을 지속할 수 없습니다.

헐리우드 모델

- 아이디어 산실
- 인재양성
- 재원조달
- 시장제품
- 기타 중요사항들의 아웃소싱

원칙 2

특기분야에 중점을 둘 것...

배벌사의 제공 서비스

- 현지화(로컬라이제이션)
- 테스팅
- 오디오
- 사설
- 이식서비스
- 웹 디자인
- 광고방송
- 인쇄

미국 및 유럽시장을 겨냥한 게임제품의 준비

- 현지화과정의 복잡성
- 디자인 단계 이전에 착수할 것
- 원판제작 이후에 완결할 것

기본적인 질문 몇가지

- 이 게임을 즐기는 수요고객층은?
- 내수용 또는 해외수출용인가?
- 영업지역은 어디로?
- 어떠한 게임을 즐기는가?
- 콘솔용 또는 PC용?
- 법적인 문제점은 없는가?
- 온라인 게임을 즐기는가?
- 판매예측 본수는?

당사의 목표고객층

Ismael Fernandez - 스페인인

- 콘솔용 25%, 포켓용 16%, PC용 34%
- 스포츠게임이 인기, 예로써 특히 풋볼게임
- 스페인어 팀들을 사용하여야 함
- 유럽시장의 5%
- 트리플 A 타이틀의 100,000본 판매
- 온라인 게임의 최대인구
- 소프트웨어 해적판의 범람
- 비디오 게임 개발의 오랜 전통

Blandine Prost - 프랑스인

- 콘솔용 38%, 포켓용 24%, PC용 58%
- 액션 / 모험물 게임의 선호
- 위법에 대하여 단호한 법률. 게임의 금지
- 모든 포장에 프랑스어 규제기준을 실어야 함
- 프랑스인의 모국어 보호
- 프랑스 발표업체들의 랭킹 탑15위 이내 진입
- 해외수익의 80%
- 프랑스의 전세계 비디오 게임시장의 8% 석권

Fabio Gurini - 이태리인

- 콘솔용 22%, 포켓용 12%, PC용 46%
- 모험물 및 전투용 게임의 선호
- 구세대 게이머들은 PC용보다 콘솔용을 선호
- 1백50십만명의 어린이들은 PC로 게임을 즐김
- 온라인 게임을 제한하는 광대역의 고비용
- 소프트웨어 해적판의 범람

Anna Andre - 독일인

- 콘솔용 19%, 포켓용 23%, PC용 61%
- 두번째로 큰 유럽시장
- 전략 게임의 인기
- 지루한 텍스트와 현지화에 부담되는 고비용
- PC가 더욱 인기를 누림
- 독일인 게이머들의 전쟁물 게임 회피
- 컨텐츠에 대한 엄격한 법규. 게임의 금지
- 광대역은 고비용이나 널리 사용됨.
  온라인 게임의 인기
- 청소년 게이머들에게 인기끄는 포켓용

Simon Lawrence - 영국인

- 콘솔용 38%, 포켓용 24%, PC용 58%.
- 최대 규모의 유럽시장
- 콘솔의 인기
- 1인칭 슈터게임이 최고의 인기 쟝르임
- 광대역이 아직 널리 보급되지 않았음에도 불구하고 온라인 게임은 성장추세임
- 소프트웨어 해적판은 큰 문제가 아님
- 제3자 최강의 개발공동체
- 최소 350,000본의 트리플 A 타이틀 판매
- 영어판은 스칸디나비아시장에서 사용가능함

Anthony McGaw - 미국인

- PC용 55%, 콘솔용 45%, 포켓용 10%
- 세계 최대시장 – 2001년도 $82억어치
- PC 게임의 43% 및 콘솔 게임의 35%가 여성플레이어임.
- 게임 쟝르의 광범위한 보급
- PC 및 콘솔의 균일한 분포
- 지역내 무료전화, 광대역 접속의 광범위한 보급
- 2006년도 무선시장 규모 $30억
- 고성능 대화식 TV 시장

당사의 대상고객

기획

- 이 제품을 현지화하여 수익을 올릴 것인가?
- 이 영업지역을 목표로 해야 할 것인가?
- 라이선스 비용은 얼마를 지불해야 할 것인가?
- 이 시장에서 온라인 게임 플레이를 하고 있는가?
- 컨텐츠는 적절한가?
- 이식을 해야 하는가?

현지화의 파트너 선정

- 게임 전문가이어야 할 것
- 다국어를 처리하여야 할 것
- 일원화된 접촉창구
- 참고자료
- 파트너들을 초기에 관여하게 할 것

디자인 단계

- 문제점은 초기에 제거할 것
- 상이한 언어는 상이한 공간을 사용할 것
- 텍스트 다음 행 넘기기 또는 생략형이 없을 것
- 현지화 치트를 코드에 포함시킬 것
- 현지화가 가능한 요소를 하드코드하거나 임베드하지 말 것

프로그래밍 힌트

- 표시
- 입력
- 조작

표시

- 어떤 언어들은 다른 문자수를 사용함
- 어떤 언어들은 전혀 다른 문자 세트를 사용함
- 날짜 및 시간이 다르게 표시됨

	USA	Europe
Dates	MM/DD/YY	DD/MM/YY
Time	1:00 pm	13:00

입력

- 사용자 입력을 주의할 것!
- 단순한 자판기 기능을 현지화하도록 할 것
- 보다 복잡한 기능들을 위하여 매뉴얼의 적합한 현지화가 되도록 할 것

조작

- 현지화된 텍스트 조작이 복잡함
- 어순이 다름
- 의미가 다를 수도 있음
- 구두법이 일치하지 않음

현지화 과정

- 조직
- 번역
- 오디오
- 그래픽
- 수정 및 통합
- 테스팅

조직

- 현지화의 시기는?
- 현지화 과정을 어떻게 체계화할 것인가?
- 개발자(업체)들에게는 현지화가 우선사항이 아님
- 전과정을 아웃소싱할 것인가?

현지화 키트

- 스크립트
- 그래픽
- 소스 코드

현지화 키트

Table 1. Sample from a localization kit

Filename	File type	Purpose	Text to be translated	Notes
Intro.bmp	BMP, 8-bit, no compression	Splash screen at game start	Click to continue…	Palette as PAL.bmp
PAL.bmp	BMP, 8-bit, no compression	Palette for main screens	–	–
Normal.bmp	BMP, 8-bit, no compression	Main menu buttons, normal state	Audio, Video, Options, Quit	Palette as PAL.bmp Each item max. 8 chars
Highlite.bmp	BMP, 8-bit, no compression	Main menu buttons, highlighted state	Audio, Video, Options, Quit	Palette as PAL.bmp Each item max. 8 chars
Pressed.bmp	BMP, 8-bit, no compression	Main menu buttons, pressed state	Audio, Video, Options, Quit	Palette as PAL.bmp Each item max. 8 chars

번역

- 항상 내국인 원어민을 활용할 것
- 게임 전문가이어야 할 것
- 번역 제공처의 확인을 요청할 것
- 쟝르에 고유한 경험

온라인 게임

- 대량의 단어수
- 여유없는 마감시한
- 일관성 문제
- 에디터의 활용
- 용어사전 및 용어관리자
- 게이머들이 후원하는 번역팀

오디오

- 가능하다면 국내 녹음
- 음성 연출가의 고용
- 배역선정 팁:
  - 승인을 위해 성우선발을 요청할 것
  - 다른 게임의 제작과정에서 활동한 경험의 여부
  - 알려진 성우의 목소리가 판매고를 높일 것인가?
- 전문 스튜디오를 활용할 것
- 제작 이전이 매우 중요함
- 사운드트랙을 주의하여 선별할 것
- 사전에 포맷 요건을 기술할 것

그래픽

- 현지화된 텍스트용 여유공간을 고려하여 그래픽을 생성할 것
- 글자체를 주의하여 선정할 것
- 글자체, 그래픽 스타일, 압축 등의 세부사항을 지시하는 디자인 가이드를 제작할 것
- 모든 자원을 통합 활용할 것
- 팔레트를 표준화할 것
- 조직하는 데에 시간을 할애할 것

통합

- 개발자(업체) 또는 현지화회사?
- ANSI/ASCII 인코딩과 호환되는 많은 이중 바이트 문자세트(DBCS)
- Unicode
- 텍스트의 사용
- 메모리 문제

매뉴얼

- 제출물
- 시장에 따라 표준 사이즈가 다양함
- 언어적인 쟁점사항에 관하여 정통한 공급업체들을 활용할 것
- 통합 솔루션

테스팅

- 타당한 아웃소싱 테스트
- 하드웨어 제작업체 표준안
- 훈련된 원어민의 활용
- 게임에 대한 매뉴얼 테스트

완본 현지화 – *Bob the Builder*

- 어린이들의 선호하는 TV 연속물
- 견고한 브랜드 가치
- 또렷한 음성인식
- 테스트용 번역

현지화된 사설 – Nintendo 유럽

- 범유럽 영업
- 전문가 사설
- 게임 저널리스트 네트워크
- 필수불가결한 속도의 관건
- 5개 언어로 매월 200,000 단어

자가 현지화 - *Championship Manager*

- 풋볼 조종게임
- 국제적인 호소력
- 지역 컨텐츠
- 내국인 풋볼팬들의 채용
- 무료 현지화!

국가 특유의 컨텐츠 – *Who Wants To Be A Millionaire*

- 국제적인 퀴즈쇼
- 전세계적인 기업연합 조직
- 국가별로 다른 일반지식

경청해 주셔서 감사합니다.

앨지 윌리엄즈(Algy Williams)

algy@babelmedia.com
www.babelmedia.com

LIONHEAD
STUDIOS

Lionhead’s Technology Design Process
From Black & White to the future…

Evans

k Healey

The Beginning…

- Lionhead is a technology driven company…
  - But the technology is *aesthetically* motivated: it's no good for a game to be technically impressive if it looks terrible or plays badly.
  - We start with only a vague idea of the game we're going to make…
  - And see what comes up during a long period of "R&D"

4 Ways to do your Tech

- There are many ways to manage the development of a game's technology
- Here we'll describe 4 different approaches
  - They're all equally valid and have different pros and cons. Most of this talk will be about the approach we chose at Lionhead.
- In "real-life", people use a blend of these methods…
- But for the purposes of clarity, here come the extremes…
    - Apologies to anyone who reckons we've got it wrong in the following slides ☺

4 Ways to do your Tech:

- Hire in some middleware
  - Very handy if you don't have the time or people to develop a new engine.
  - Eg G.T.A 3 use renderware.
    - I think! (sorry if not ☺)

Tech Method 2

- Work out an exact game design, and then build the perfect engine for that design
  - Works if you know what you're doing from the outset

Tech Method 3

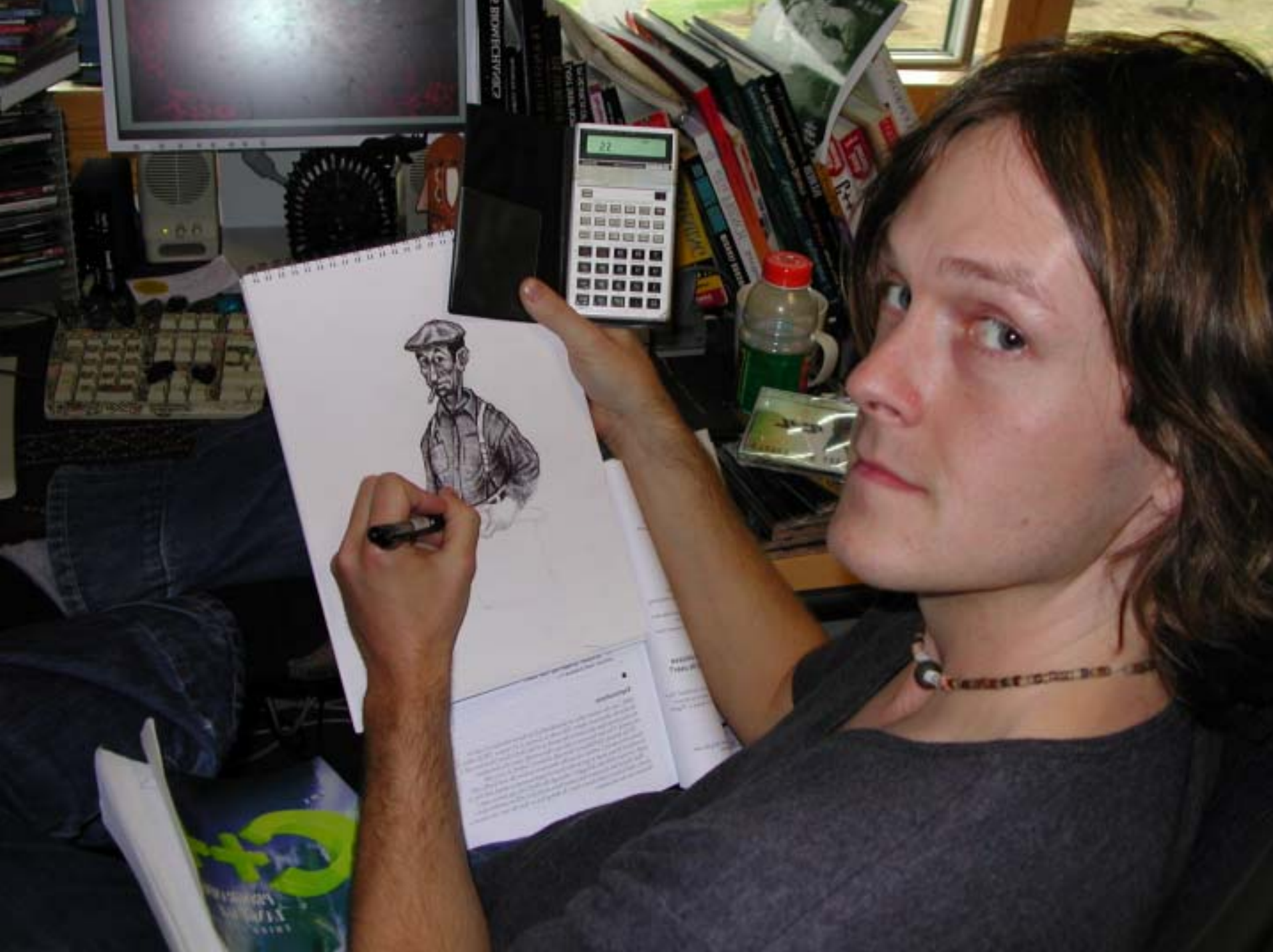
- Try to write an engine with the biggest numbers and the newest features
  - And worry about how it looks later…

    - eg Unreal Tournament

  These guys are the Tech Leaders…

Tech Method 4

- Or… the Lionhead way:
- Build technology in an ad-hoc way
- Have small teams of 2 or 3 doing R&D
  - One or two artists
  - One (or zero) programmers
- It helps to have people skilled in more than one area
  - Programming artists, Artistic Programmers



The Super-fast R&D cycle

- These days, game teams are too big to really do fast creative work…
  - So we split them up for the R&D period.
- When two people are working closely together, the results are often far better than people working in isolation
  - Absolutely no excuse for “programmer art” from the coders, or unusable artwork from the artists.
  - Friendly Competition!

Case Study: The Citadel

- The Citadel is the center of your power in the game “Black & White”

The Citadel

- The interior was designed in rough by an artist (Paul McLaughlin). He wanted an impressive feel, and a temple or church like atmosphere.

The Citadel

- Inspired by his sketches, I developed custom MAX plugins for lighting and texturing
- When he saw the results, he went back and re-did the artwork!
- This process repeated several times, every few days.

The Citadel (more)

- As he worked on the artwork, the code developed in parallel.
  - Problems on each side could be quickly resolved
  - New ideas we could never have planned for, appeared everyday
- Most importantly, this all took place over the space of only 2 weeks
  - Once the concept was proved, the hard work began. But the results were much better than we could ever have hoped for.

Case Study 2: Creature Animation

- One of the biggest features of Black&White!
  - Took a huge amount of art and code resource
  - Pulled together lots of elements and people on the team: Animation, Navigation, Physics, AI, Rendering
- A lot of this case study is based on the amazing work of Scawen Roberts, Eric Bailey and Richard Evans.

moo-cow
don't eat us

So this is how it panned out…

- The three worked so tightly together over the 2 years development period, that the quality level was constantly being raised by a kind of “competitiveness”.
  - “The animation system can now do this, can you put that in the AI?” and vice-versa, etc etc

scawen creates
animation system,
sets limits...

scawen creates
simple path finder...

richard uses it in
crazy ways

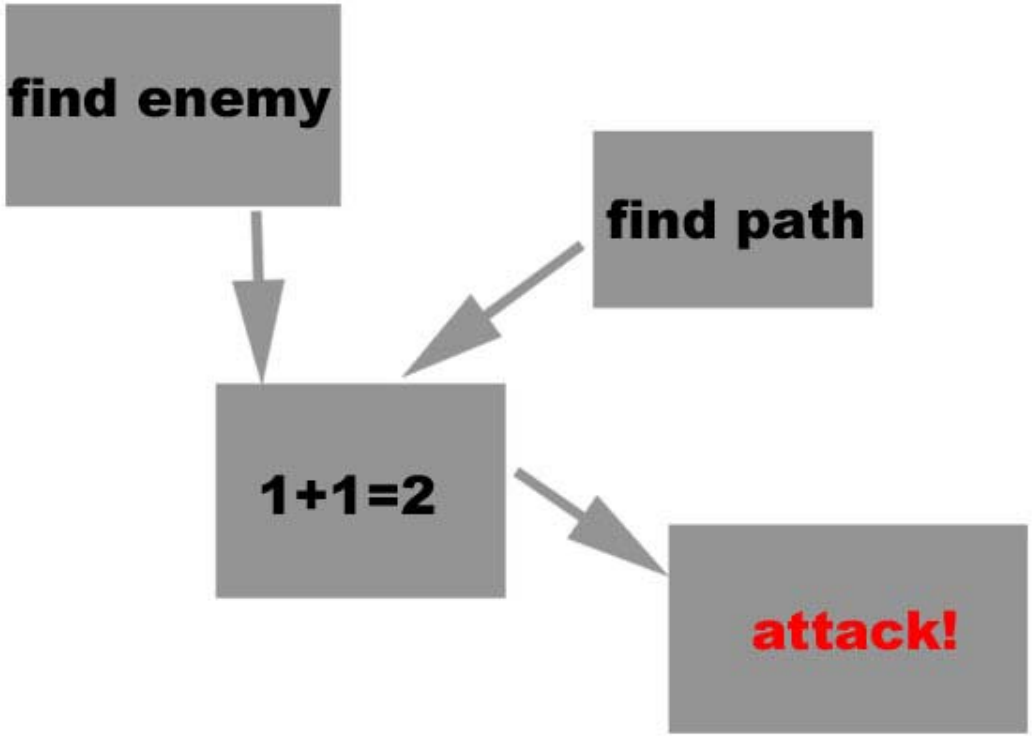
...eric breaks them,
inspires scawen
to improve code

and vice versa

richard writes
AI and control code...
sees new life in eric's
animations, adds more to AI...

Not doing it by the book 1

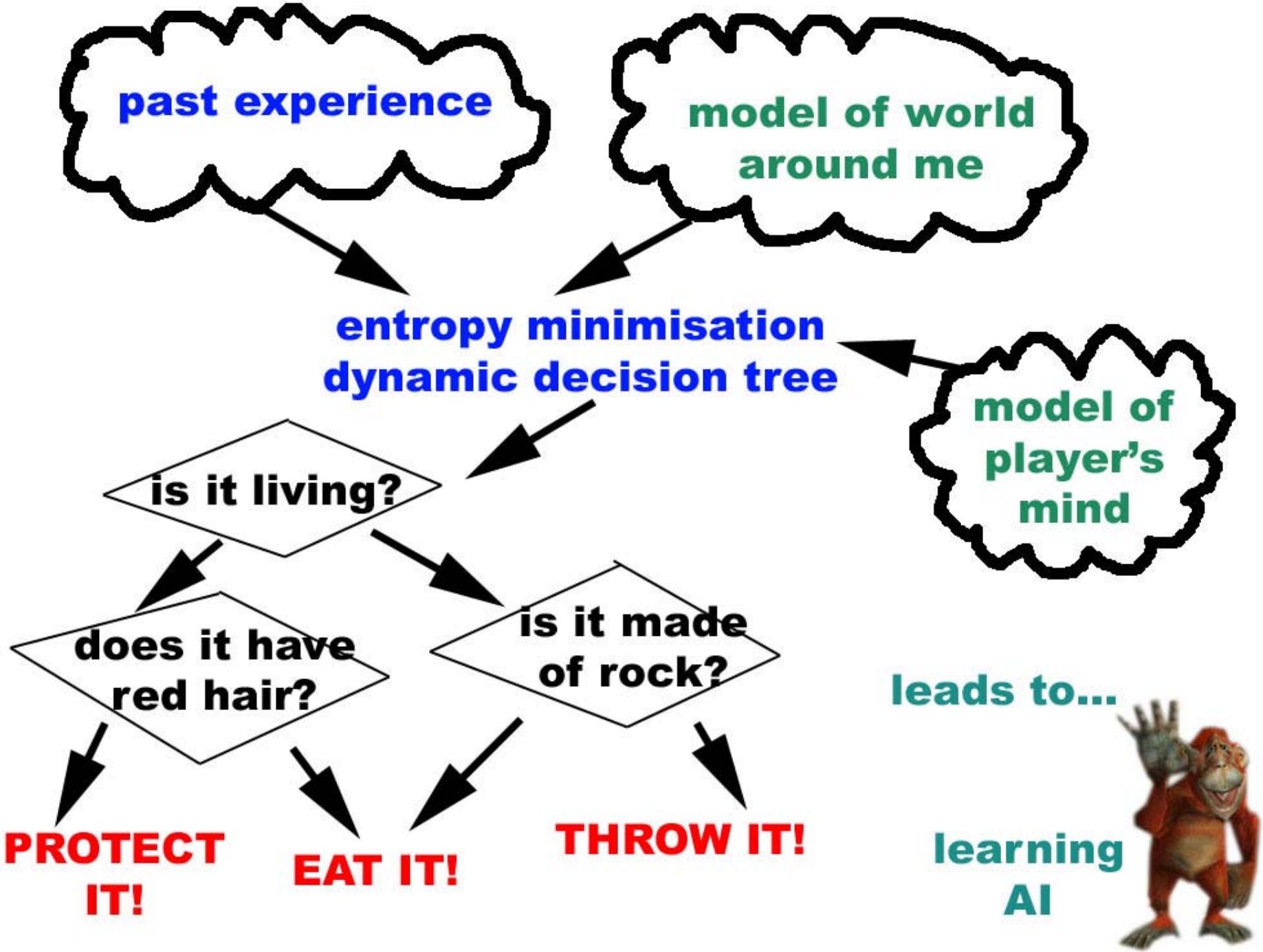
- “There isn’t enough CPU power yet to justify interesting AI”
  - Yes there is!



leads to....

OLD FASHIONED AI BEHAVIOUR

NO LEARNING...

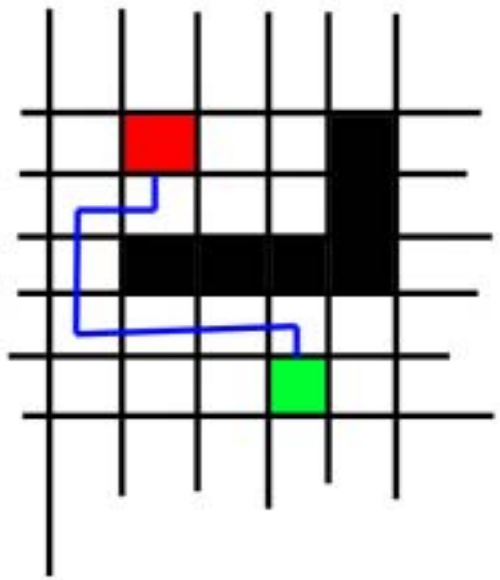

past experience
model of world around me
entropy minimisation dynamic decision tree
model of player's mind
is it living?
does it have red hair?
is it made of rock?
PROTECT IT!
EAT IT!
THROW IT!
leads to...
learning AI

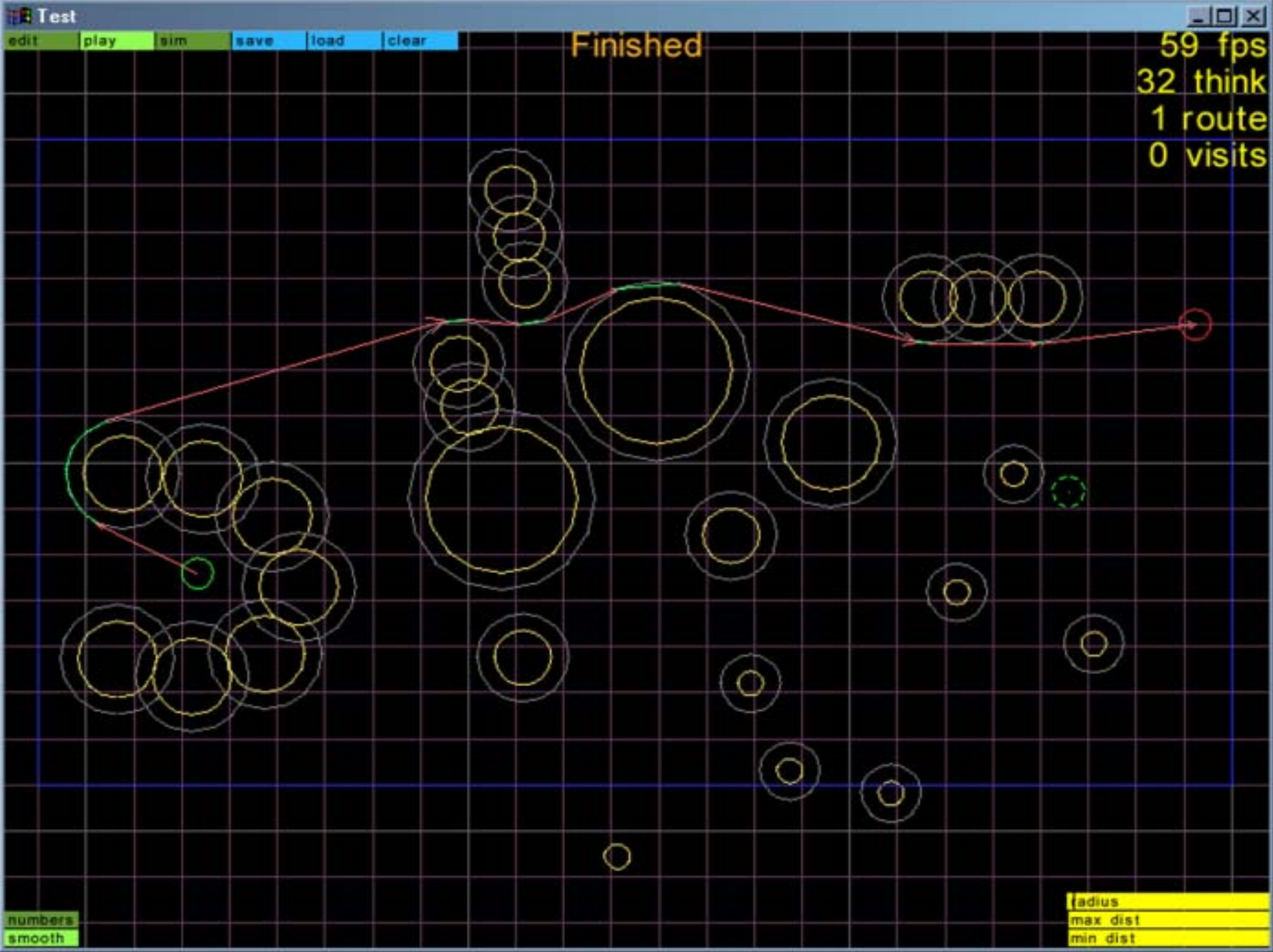
Not doing it by the book 2

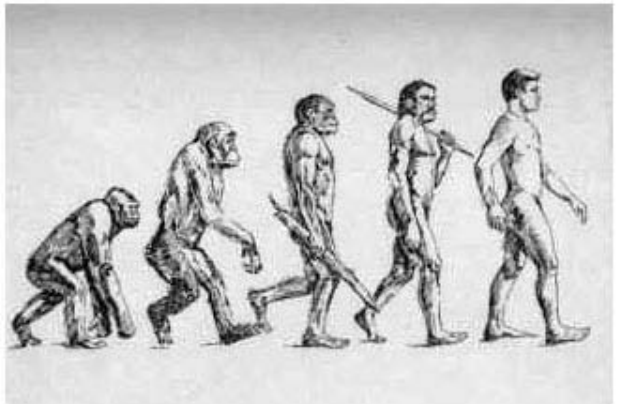
- “Navigation is done by A*”
  - Scawen’s ad-hoc approach and why it worked
  - He’d never read a book on A* in his life…
  - So he rolled his own method, based on his life as a Motorcycle Courier.

Navigation the Normal Way

- Often grid based
- Goal Based
  - Often works by wall-hugging or “smell”.
- Which is fine for many purposes
  - (eg Villagers in B&W)




Test
edit
play
sim
save
load
clear
Finished
59 fps
32 think
1 route
0 visits
numbers
smooth
radius
max dist
min dist



morph young + old

morph good evil
also fat+thin
lazy+fit

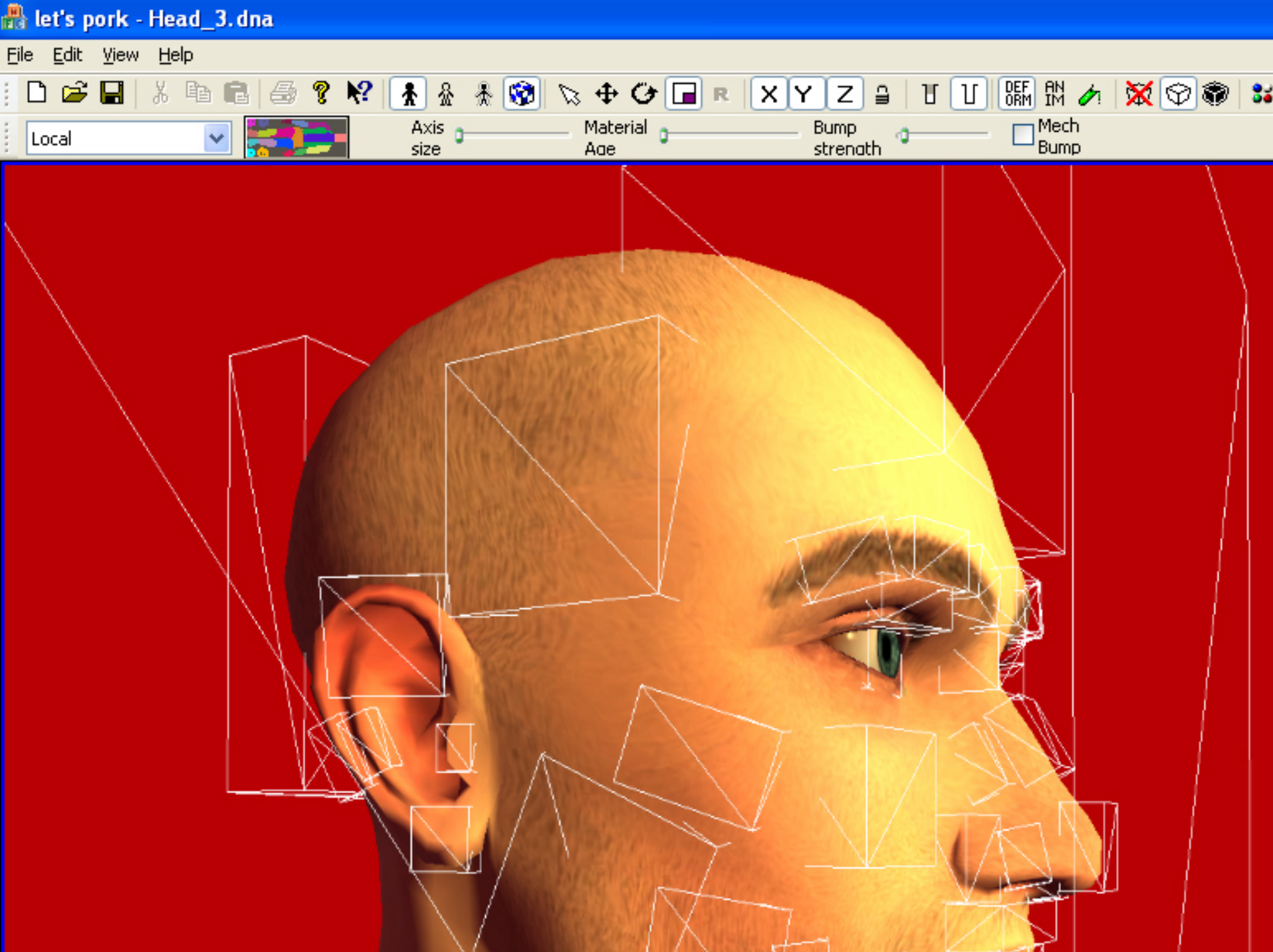
generates
texture,
mesh,
skeleton,
new animations

Case Study 3: Character Generation

- We needed a tool to design a variety of stylised characters.
  - Wanted to support a number of different styles of working for the artists.
  - Mark started by creating some models in MAX…
    - He used his knowledge of what was possible in code, and pushed those limits without going too far.

Character Generation 2

- The code for the character generator was created based on what Mark was doing with the artwork
  - But introduced new features, problems and opportunities he hadn’t planned for
  - So once again, a really tight feedback loop between artist and coder.


let's pork - Head_3.dna
File
Edit
View
Help
Local
Axis size
Material Age
Bump strength
Mech Bump

Summary

- Lionhead relies on close co-operation between small teams of Artists and Programmers
- The design process happens as we go along…
  - Of course that happens in all companies…
    - But we try to make a virtue out of it, rather than being afraid of the unknown…
    - But deadlines do slip a lot as a result.

…so in the end

- The R&D phase ends, even at Lionhead
  - Hopefully by that point we have more than enough to work with
    - So we write a document locking stuff down, and throw away the bad stuff.
    - An important part of the R&D process is being able to throw away the worst bits, and keep the best.
  - It’s only at this point that deadlines get introduced.

Thankyou

- We hope this has been an interesting talk!
- Any questions?