

Žaidimų pramonė

Aras Pranckevičius
Unity Technologies

Aš

- KTU IF BSc, MSc
- Demoscene (nesnausk.org)
- LTGameJam
- ShaderX straipsniai
- Microsoft DirectX MVP
- PSI: Sibiro Konfliktas
- Unity Technologies, Graphics Lead



Hm, jo...



Žaidimai



GAMEF5

URF'S ELITE FIGHTING FORCE

With their highly developed eyes, dextrous fingers and amazing reflexes, gamers have become the last word in conflict resolution.

Lavina įgūdžius!

Pramoné



\$21 mlrd. 2008



AAA



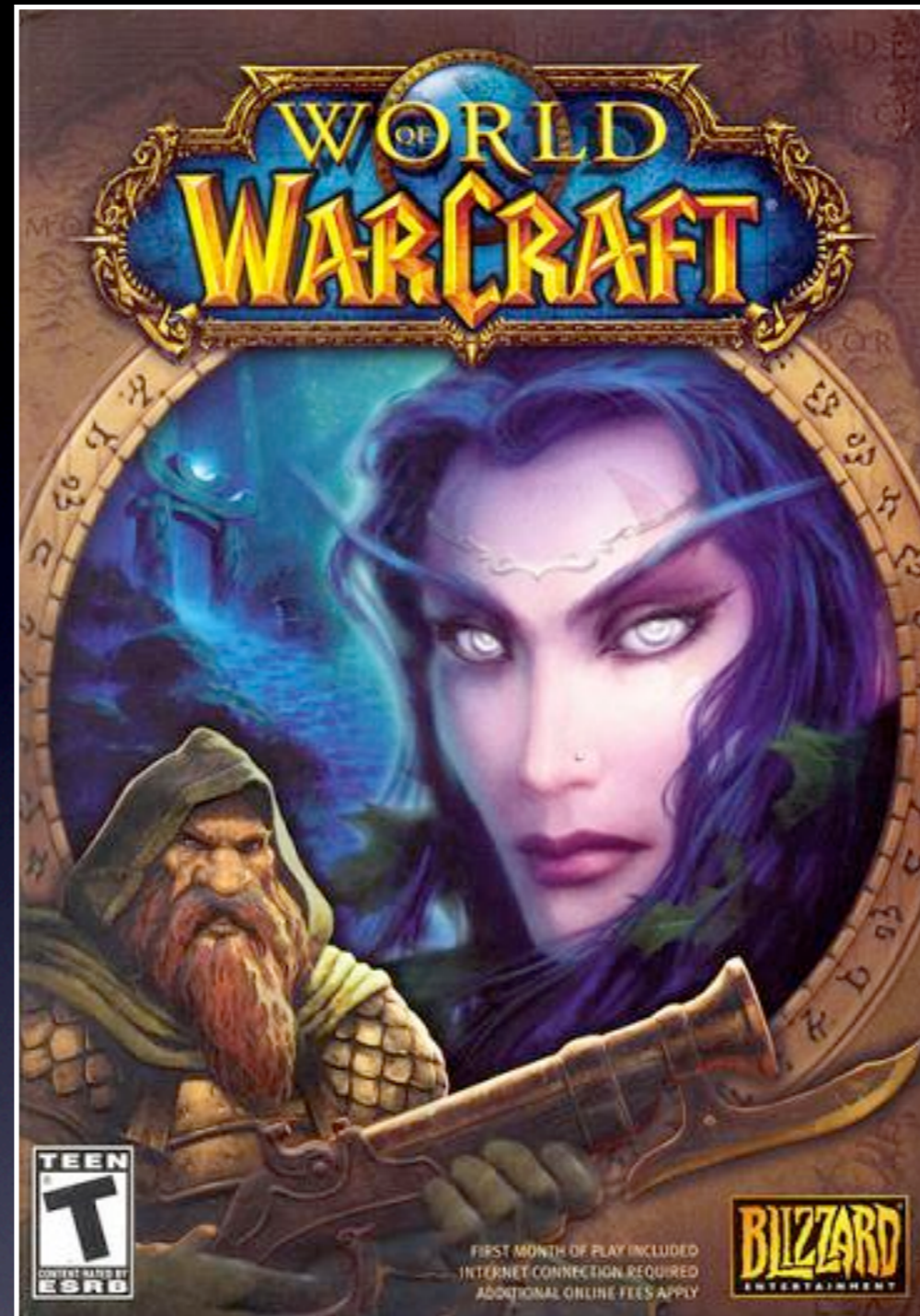
Casual



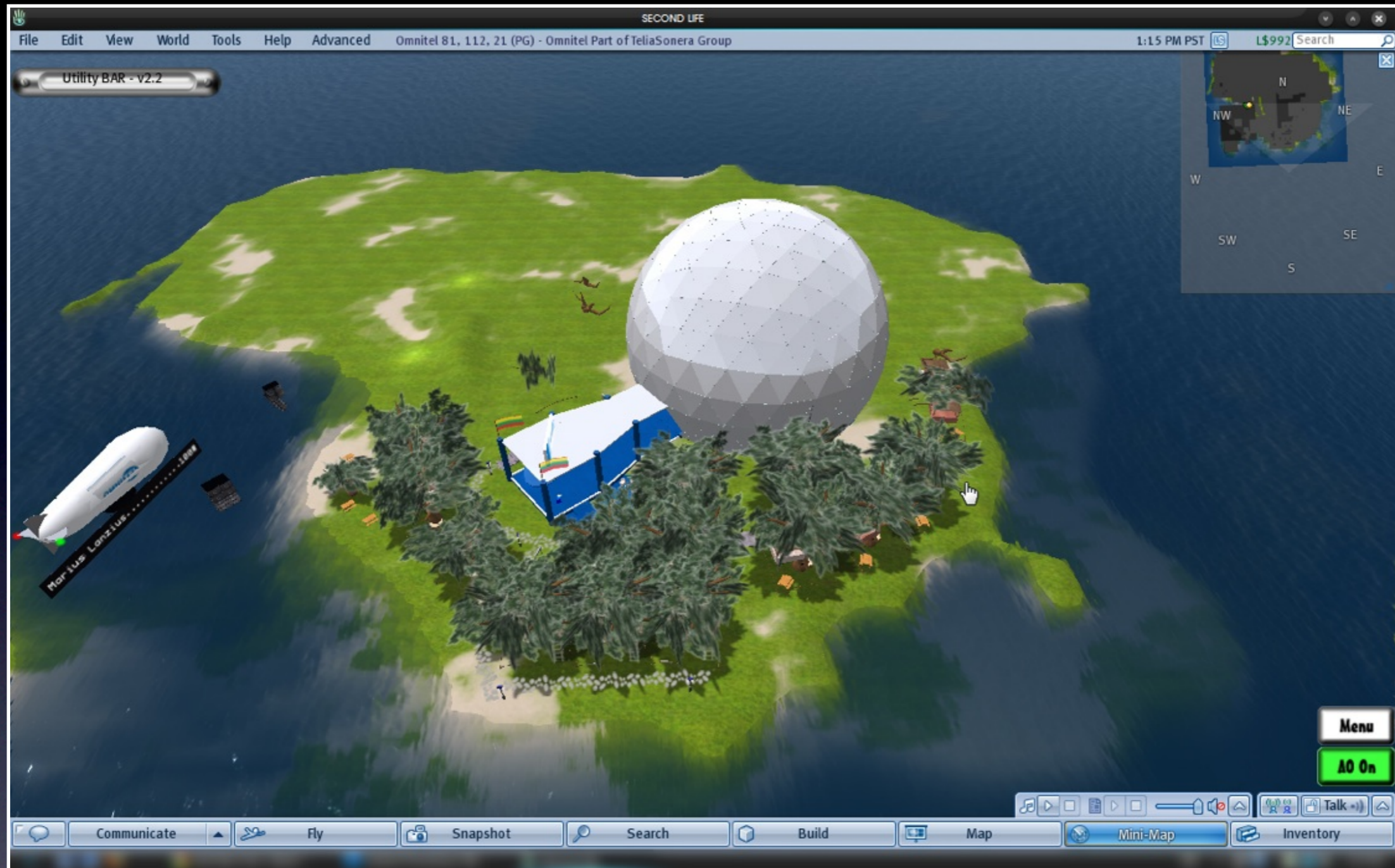
Mobile



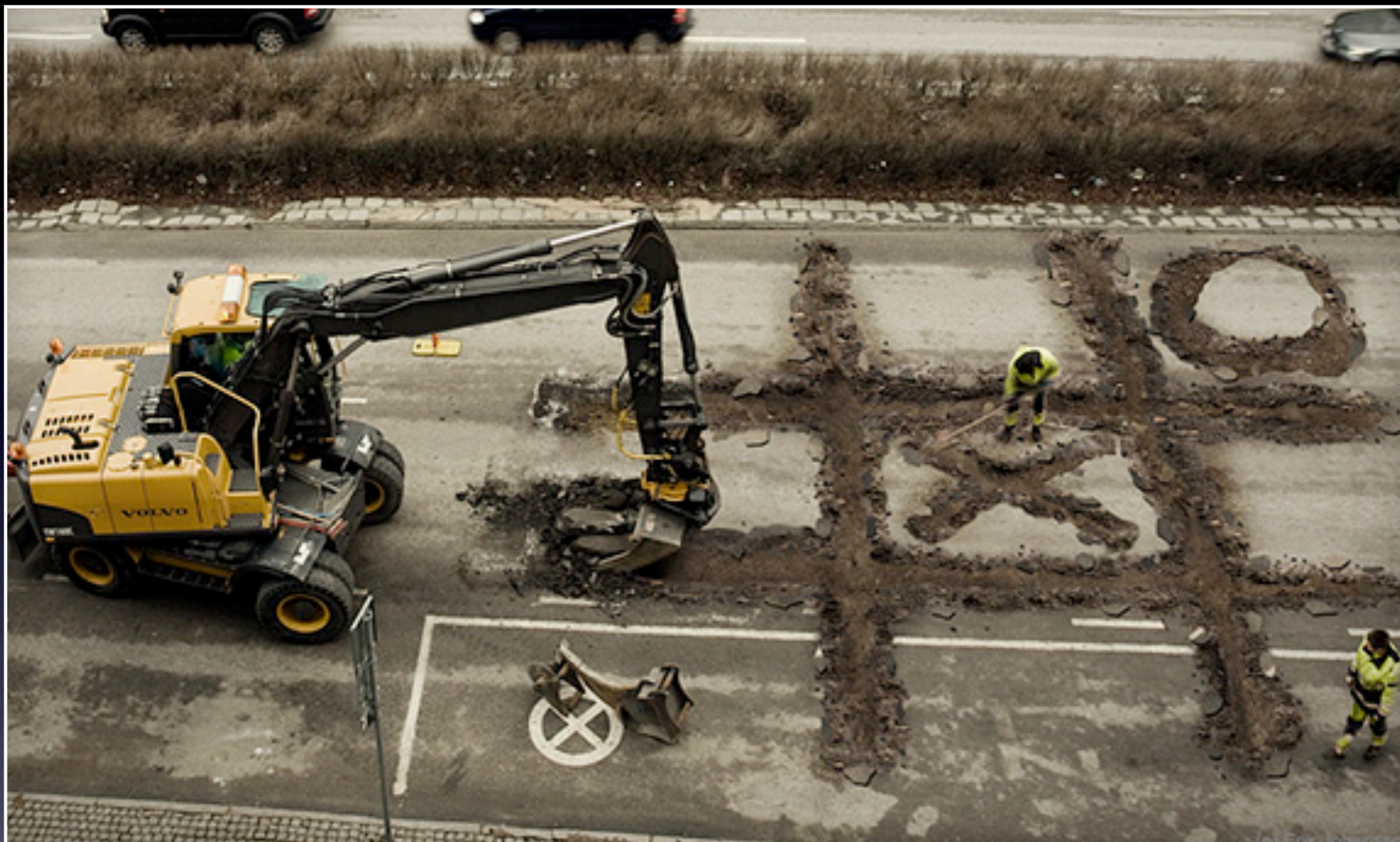
iTV / Pay TV



MMO



Virtual Worlds



Kiti

Dramatic Chipmunk



★★★★★ 43,043 ratings

14,091,274 views

★★★★★ 43,043 ratings

14,091,274 views



Kiti

Quiz Time!

5 labiausiai perkami žaidimai 2008?

(dėžutėse parduotuvėse)



#1 Mario Kart Wii
8.9M



#2 Wii Fit
8.3M

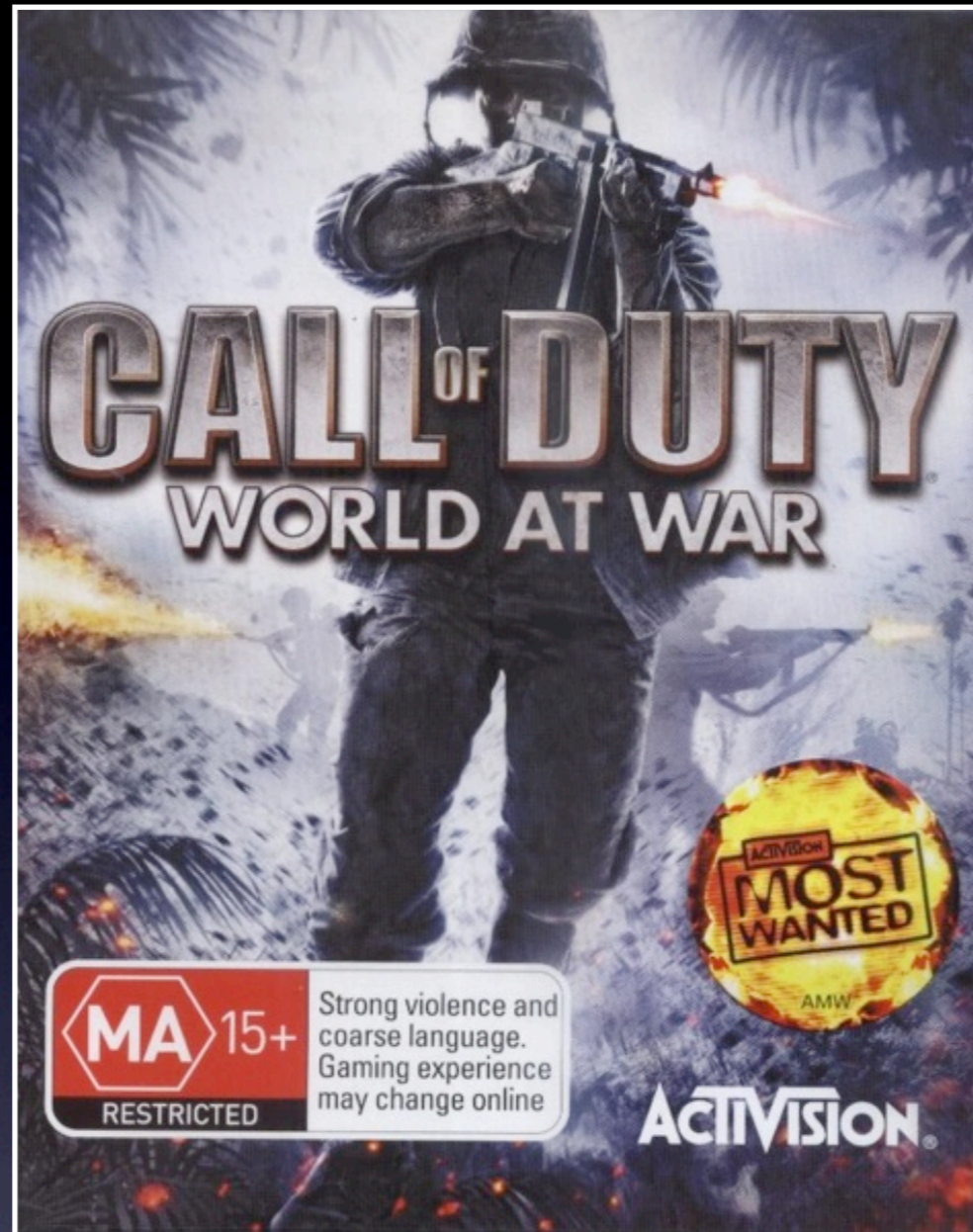


#3 GTA IV
7.3M



#4 Super Smash Bros: Brawl

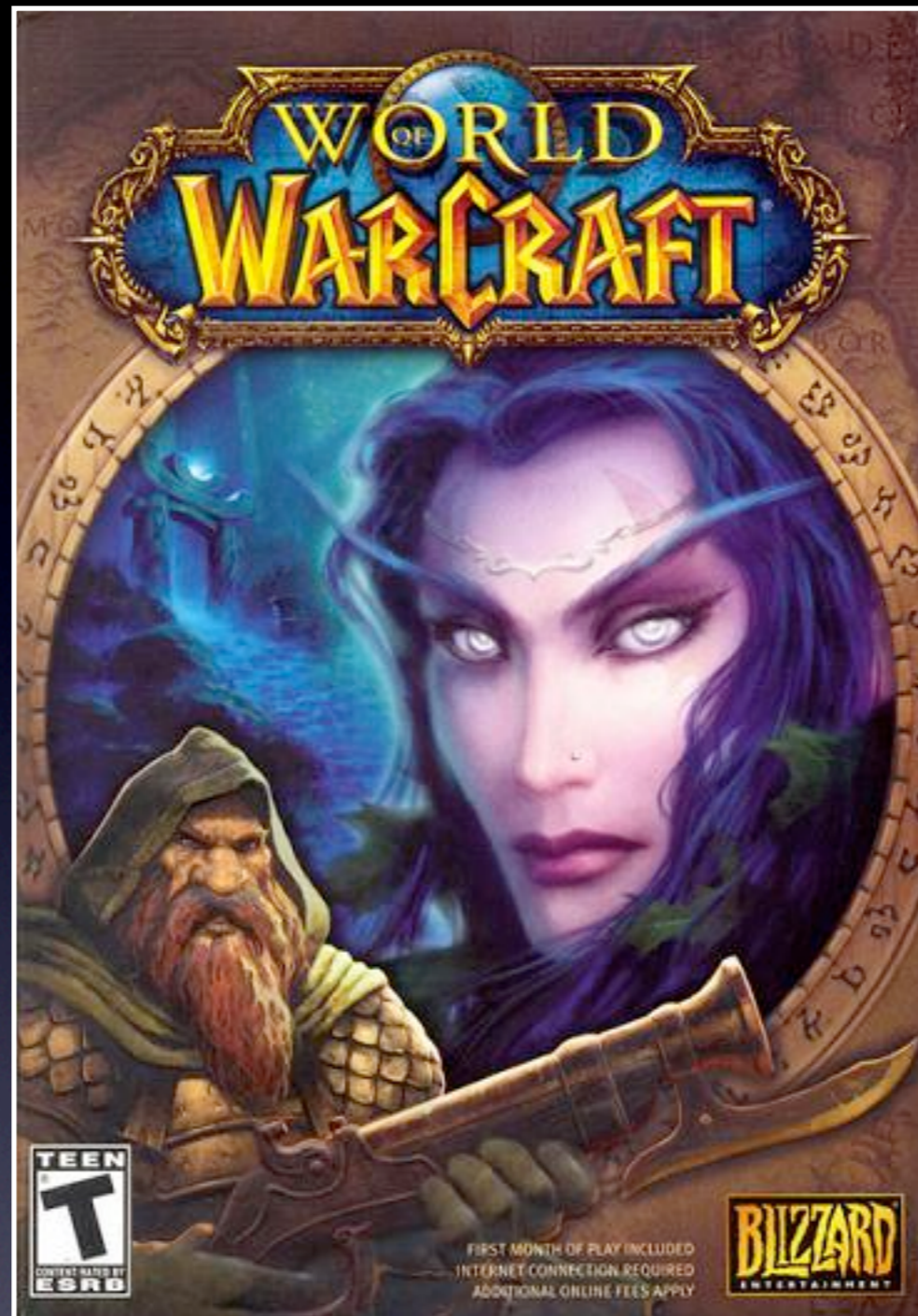
6.3M



#5 COD: World at War
5.9M

Didžiausi MMO 2008?

(pagal pajamas)

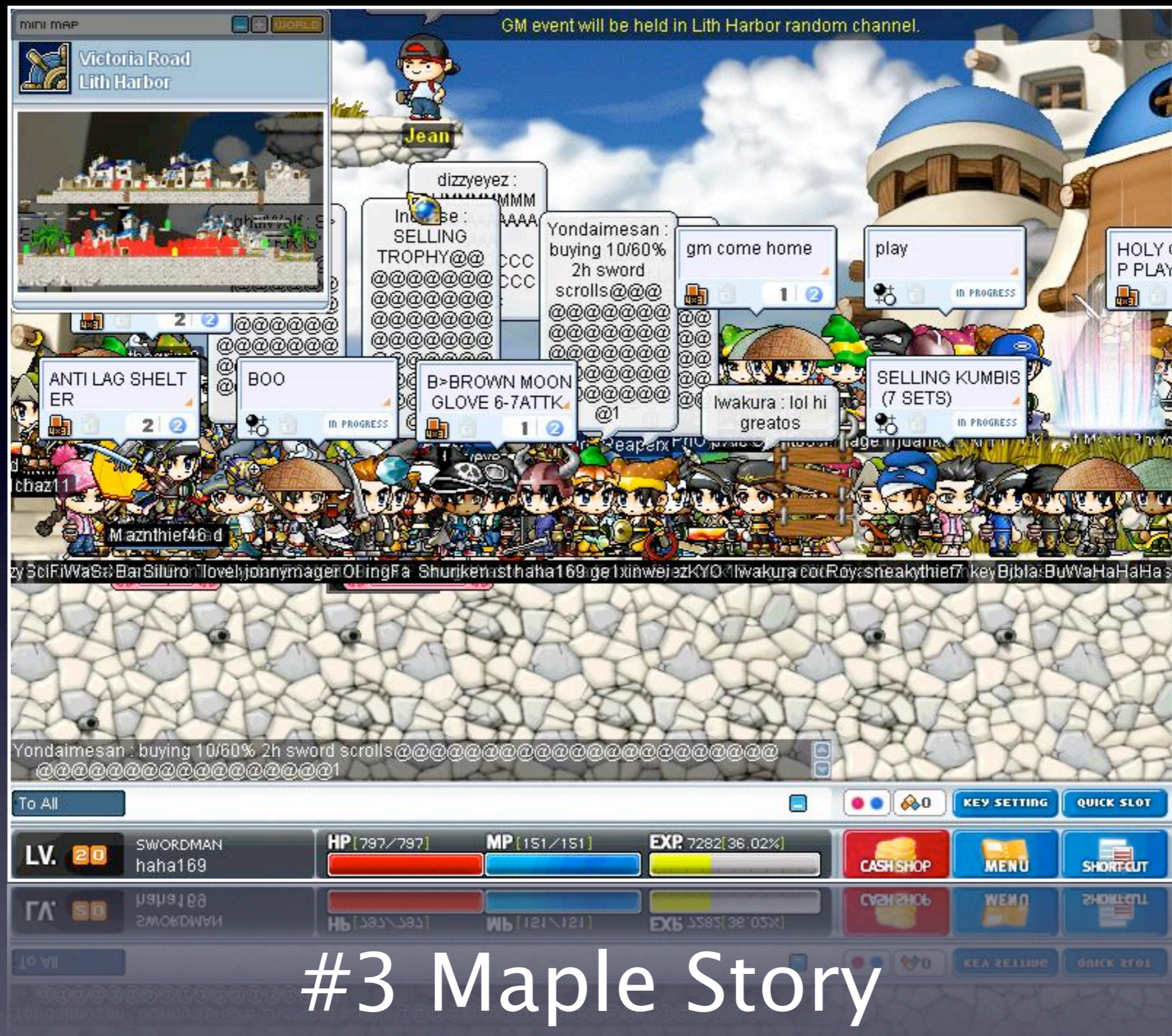


#1 WoW \$500M+



#2 Fantasy Westward Journey \$150–500M

...Azija



#3 Maple Story
\$150–500M

- #4 Shanda
- #5 Lineage
- #6 Runescape
- #7 Club Penguin
- ...

Iliuzijos



Aš kuriu MMO!



Aš kuriau MMO!

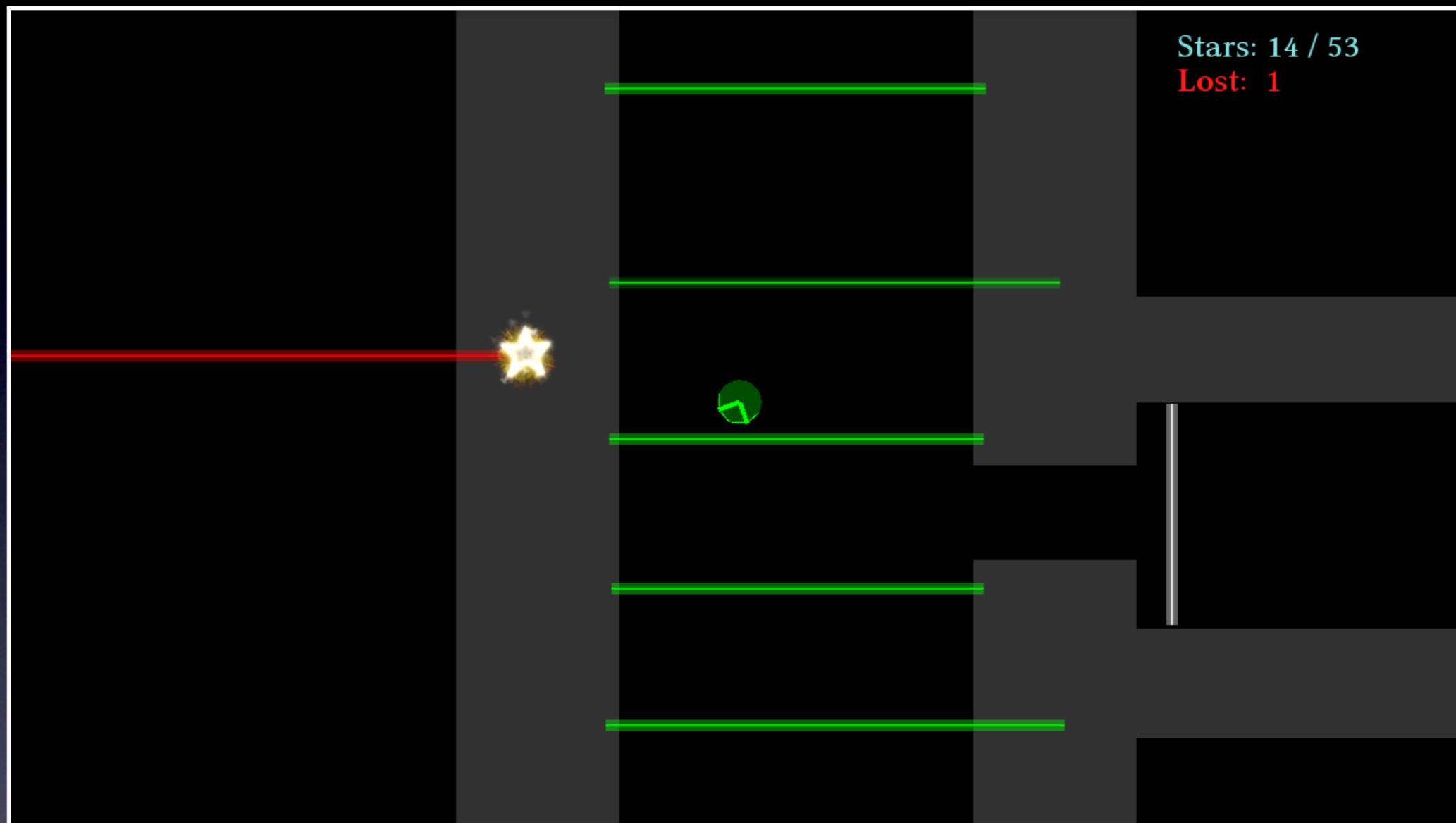
- MMO yra sudėtingi
- Backend
 - Scalability
 - Reliability
- Ir pats žaidimas!

Mes darom žaidimą...

- ...ir pradedam pasakoti istoriją

Mes darom žaidimą...

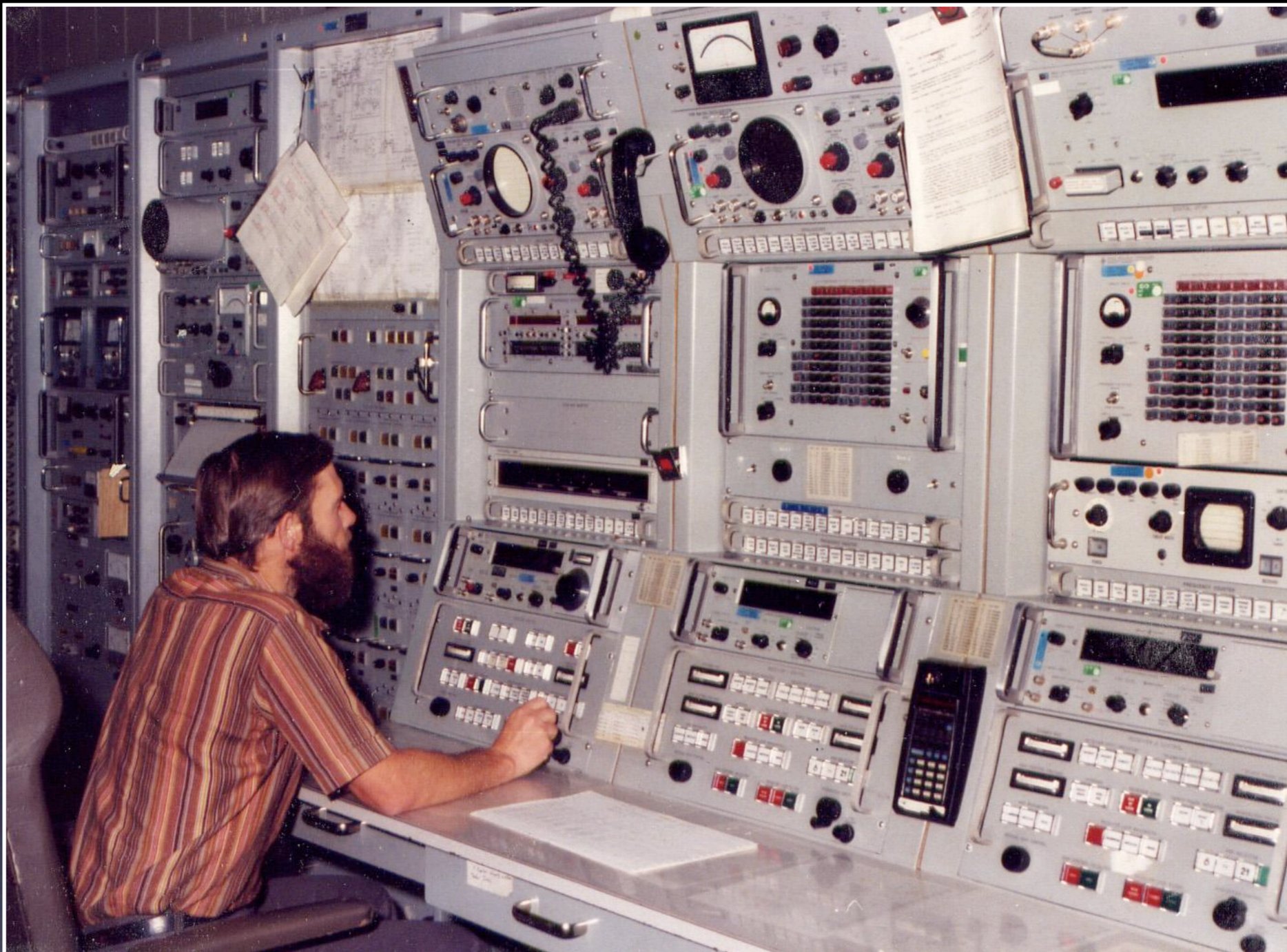
- ...ir pradedam pasakoti istoriją
- Žaidimas nėra istorija!



Žaidimas!



Balansavimas



Daug balansavimo

Kas kuria žaidimus?





Kompanijos

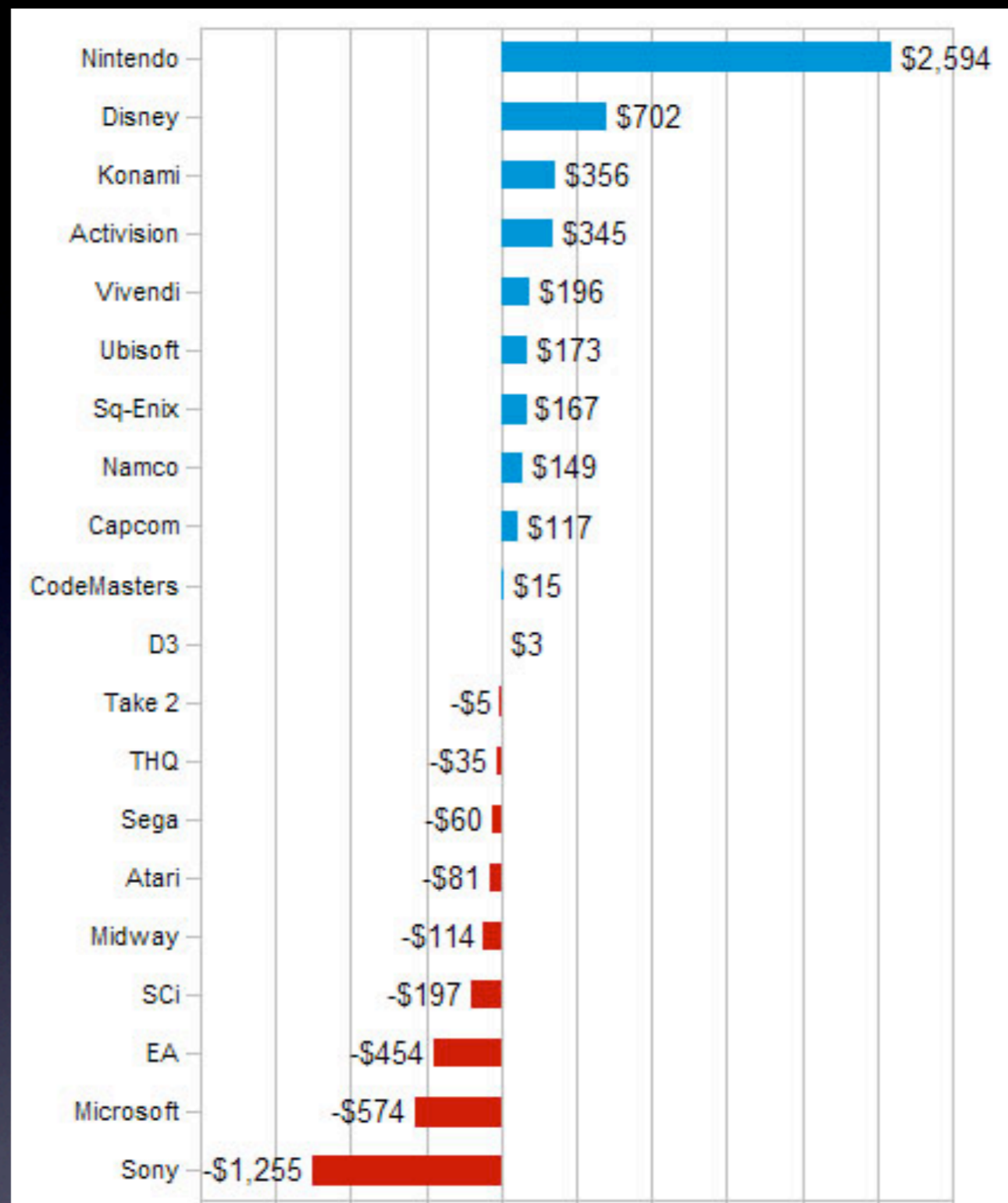


Nepriklausomi



Pavieniai

Platinimas



Platintojai



THE INTERNET

A series of tubes.

Platink pats

Platinimas

- Parduotuvės
- Digital (Steam, XBLA, PSN, ...)
- Internetas
 - Pajamos iš reklamos?

Kaštai

Dideli žaidimai

- \$10–30 mln.
- 30–80 žmonių
- 1–2 metai darbo



Auč!

Nedideli žaidimai

- Kainuoja mažiau :)



Minotaur China Shop

Minotaur China Shop

- 6 žmonės
- 2 mėnesiai
- Naudojo Unity :)

SERVER	TABLE	GUESTS	DATE	CHECK NUMBER
				323001
1		Hardware		\$4,000
2		Software		\$1,000
3		QA		\$5,000
4		Localization		\$5,000
5		Legal fees		\$5,000
6				
7		Living Expenses		
8		2000 / month		
9		8 months x3		
10		\$48,000		
11		2 people		\$96,000
12				
13				
14				
15				
16		COFFEE	TEA	MILK
Thank You!				FOOD
				BEVERAGE (OTHER SIDE)
				SUB-TOTAL
				TAX
REORDER NO. TL-620				TOTAL \$116,000

REORDER NO. TL-620	TOTAL	\$116,000
	TAX	

Specializacijos



Prodiuseriai



Dizaineriai



Dailininkai



Kompozitoriai



Testuotojai



Programuotojai



Programuotojai

Programuotojai

- Smart
- Get ~~Shit~~ Things Done
- See The Big Picture

- Greitai!
- Kaip veikia kompiuteris
- Išmok pats
 - Universitetas niekam nerūpi

Dideliem žaidimam

- C/C++
- Middleware
- Lua, .NET, Lisp, ...
- Įrankiams: .NET, C/C++

Mažiem žaidimam

- Flash
- Unity
- Game Maker
- XNA
- C/C++
- ...

Taip pat!

- Matematika
- Fizika
- Duomenų bazės
- Tinklai
- Patikimumas
- ...


Kaip pakliūt?



Daryk Mod'a



Laisvalaikio projektai



ESNAUSK!
Projects

★ 116736
TOP 100 5


News
Projects
Zenit
in.out.side
Project Hoshimi
IC Invitation
The Fly
SynDent
Demo 612
R-Type
demo.scene.it
ffKorez
LTGameJam'03
PSX games
Exolon
Boulder Dash
LTGameJam'02
Bzhykt
Evil

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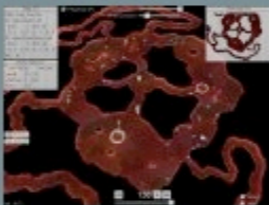
Zenit 2005-2007


PC Demo, for *The Gathering'07* contest.
[more info...](#)


in.out.side: the shell 2005 Jan-May


PC Demo, for *ImagineCup'05* contest.
[more info...](#)


Project Hoshimi 2004 Aug-Oct


"3D previewer" for Visual Gaming category of MicroGameJam.
[more info...](#)

Imagine Cup invitation 2004 Jul


PC Demo: invitation (also know as "Secret government").
[more info...](#)

Dirbk grupėje

★ Jon .. Jon .. Nicholas (18)	gd-algos	Inbox	[Algorithms] Complexity of new hardware - Nicholas "Indy" Ray wrote:	00:17
★ asynclib .. Conor, ~BG~ (17)	gd-algos	Inbox	Re: [Algorithms] General purpose task parallel threading approach - 5	20:27
★ Jon .. Jon .. Gregory (97)	gd-algos	Inbox	Re: [Algorithms] General purpose task parallel threading approach - 5	Apr 15
★ Michał .. Tony, Jon (19)	gd-algos	Inbox	[Algorithms] MegaTexture/Sparse Virtual Texture - finding pages need 	Apr 14
★ asynclib .. Sebastian (58)	gd-algos		[Algorithms] General purpose task parallel threading approach - On Fri, Apr 10, 20	Apr 10
★ Matt, Jon (4)	gd-algos	Inbox	[Algorithms] Cutting algorithm for creating a geometric image - I'm ha	Apr 8
★ Manolache .. Bert, Jon (8)	gd-algos	Inbox	[Algorithms] Fixed time step loop with varying framerate - I've stumble	Mar 18
★ Manolache Adrian	gd-algos	Inbox	[Algorithms] (no subject) - That's very interesting Jason, glad to know it's	Mar 18
★ Oscar .. Nicholas (55)	gd-algos	Inbox	[Algorithms] Message Passing - Hi all, I've working on a multi-threaded,	Mar 12
★ Matt .. Jon, David (8)	gd-algos	Inbox	[Algorithms] Multivariant curve fitting - How can I approximate a functio	Mar 12
★ Jon .. Stefan, Ola, Jon (15)	gd-algos	Inbox	[Algorithms] Aproximating a sphere with boxes - Hi there, I'm working '	Mar 12
★ Sylvain .. Matt .. Matt (76)	gd-algos	Inbox	[Algorithms] How to get 3dvector largest coordinate index? - Ah, yeah	Mar 7
★ Justin, christer_er. (2)	gd-algos	Inbox	[Algorithms] Strict Aliasing (was Re: How to get 3dvector largest coo	Mar 5
★ Eric, Stefan, Ignacio (3)	gd-algos	Inbox	[Algorithms] Fast mesh silhouette detection? - I'm poring through the si	Mar 5
★ Ruslan, Jon (2)	gd-algos	Inbox	[Algorithms] Coordinate system conversion for 3D assets - general ca	Feb 26
★ Damian .. Gregory, Jon (10)	gd-algos	Inbox	[Algorithms] Dynamic Plane Shifting BSP Traversal Problem - Hi all, I	Feb 26
★ metanet .. David, Jon (7)	gd-algos	Inbox	[Algorithms] Extending 2-link analytical IK to deal with chains - hi, I'm	Feb 20
★ pontus .. christer_er. (7)	gd-algos	Inbox	[Algorithms] Line-Cylinder intersection problem - Hi, I'm currently in th	Feb 18
★ Andrew .. Andy (21)	gd-algos	Inbox	[Algorithms] Adding depth peeling (and other shader extensions) eas	Feb 17
★ Paul .. Conor, Matt, Tom (18)	gd-algos	Inbox	[Algorithms] Software Quad Rotate - Hi all, time for the oldies to show o	Feb 14
★ Johan, metanet, Jon (4)	gd-algos	Inbox	[Algorithms] Generating Interior Border Geometry - I'. trying to generat	Feb 13
★ lists .. Jon, Marc (17)	gd-algos	Inbox	[Algorithms] Non Flipping Orient Constraint - List, I'm having a bit of tr	Feb 12
★ Andrew .. Jon .. Andrew (6)	gd-algos	Inbox	[Algorithms] Wrapping primitive rendering - In DX10, you can detect tr	Feb 10
★ Andrew .. Jeff, Nicholas (4)	gd-algos	Inbox	[Algorithms] DOF and shadows of transparent objects - Hi, I have a sc	Feb 9

Forumai, diskusijos, ...

tech.blog

 Search

Tweets

Maža vietinė 3D konferencija rytoj:
<http://tinyurl.com/csyvar> about 2 hours ago

I want a No-Ped:
<http://theurf.com/2008/08/the-no-ped/> about 6 hours ago

@barog Latency kills... I'm not complaining though, assembly is sort of cool. about 10 hours ago

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Archives

« Quote of the day

Twitter! Twitter! »

Fixed function lighting in vertex shader - how?

Sometime soon I'll have to implement fixed function lighting pipeline in vertex shaders. Why? Because mixing fixed function and vertex shaders in multiple passes does not guarantee identical transformation results, thus requiring depth bias or projection matrix tweaks, which leads to various artifacts that annoy people to hell.

I don't really know *why* that happens, because it seems that most modern cards don't have fixed function units, so internally they are running shaders anyway. DX9 runtime on Vista's WDDM also seems to be only handling shaders to the driver internally. Still, for some reason somewhere the precision does not match...

How such a task should be approached?

My requirements are:

- Should handle any possible state combination in D3D fixed function T&L.
- D3D 9.0c, using vertex shader 2.0 is ok. For now I don't care about OpenGL.
- No HLSL at runtime. I don't want to add a megabyte or more to Unity web player just for HLSL. DX9 shader assembly is ok, because we already have the assembler code.
- Should work as fast (or close to) as the regular fixed function pipeline.

I looked at ATI's [FixedFuncShader sample](#). It's an **ubershader approach**; one large (230 instructions or so) shader with static VS2.0 branching. It had some obvious places to optimize, I could get it down to 190 or so instructions, kill some rcp's and reduce the amount of constant storage by 2x.

Still, it did not handle some things in the D3D T&L or had some issues:

- It assumes one input UV, one output UV and no texture matrices. This place in T&L gets quite convoluted - any input UVs or a texgen mode can be transformed by matrices of various sizes, and routed into any output UVs.
- It was not using full T&L lighting model. No biggie here.
- I haven't checked with NVShaderPerf or AMD ShaderAnalyzer yet, but last time I checked the static branch instruction was taking two clocks on some NV architecture. So ubershader approach does not come for free.

Another thing I'm considering, is to combine final shader(s) from **assembly fragments**, with some simple register allocation.

with some simple register allocation.

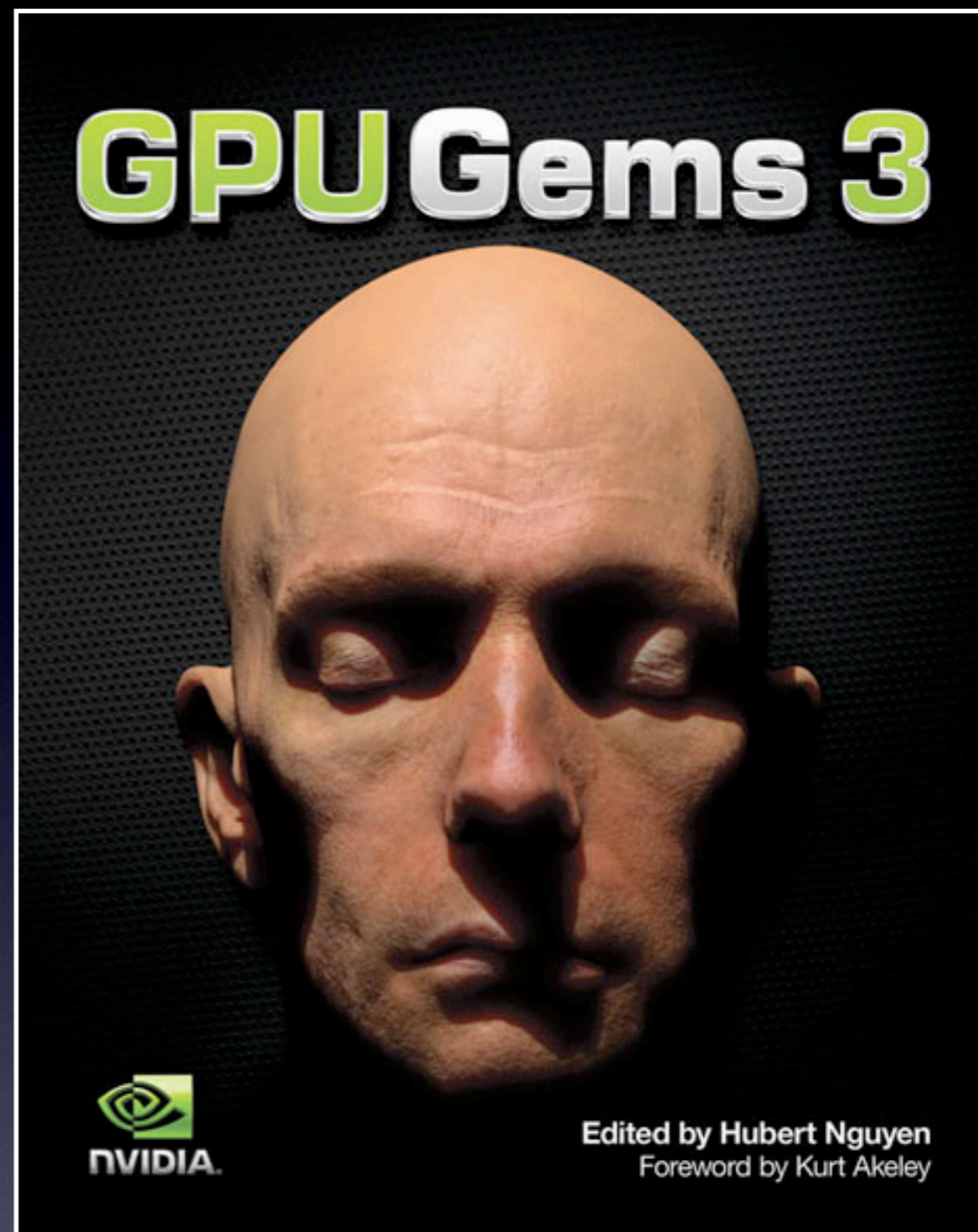
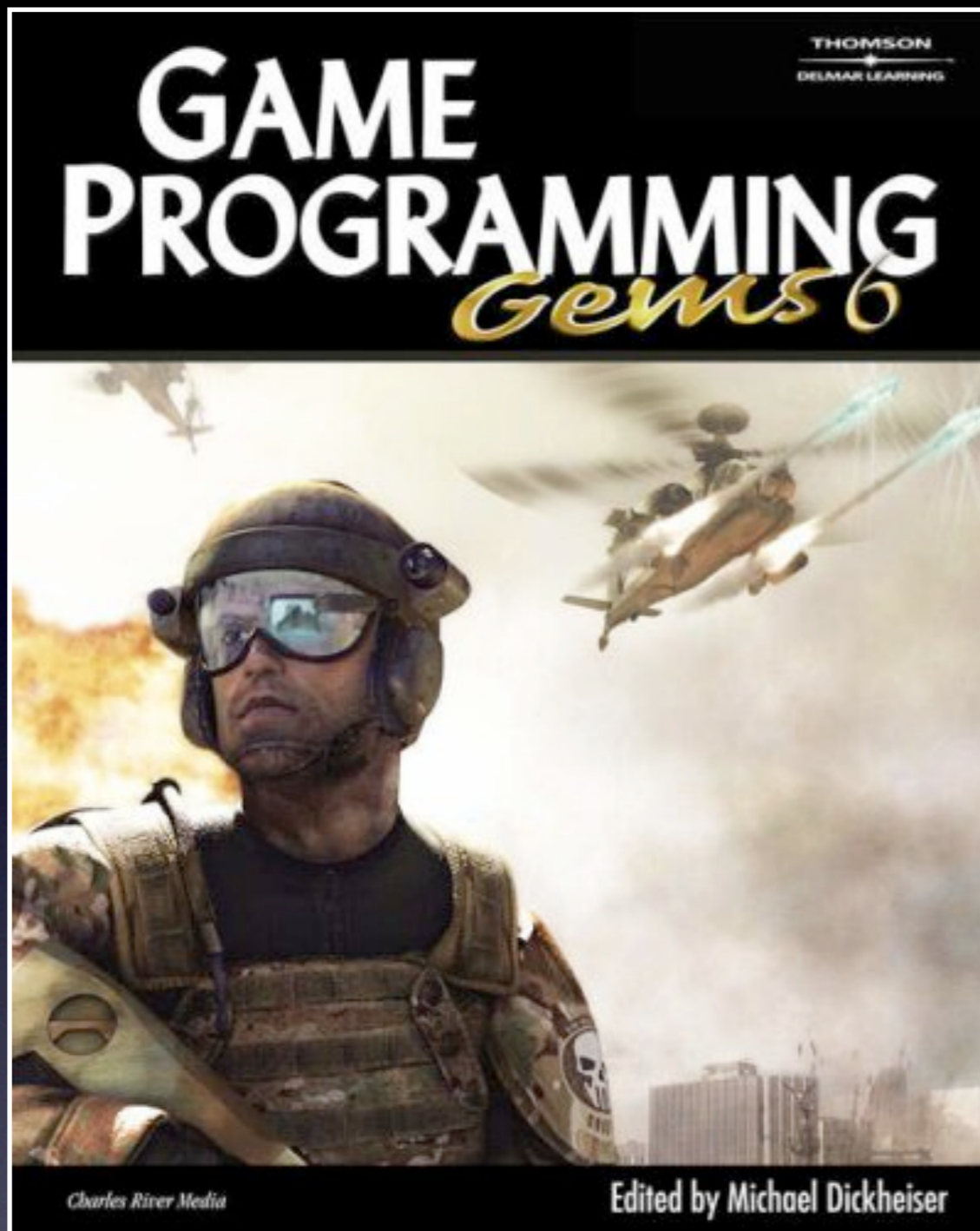
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Turèk blog'ą



Rašyk straipsnius

Daryk žaidimus!

- iPhone
- PSP
- Unity
- Flash
- ...



Tiesiog eik dirbti!

Kaip eiti dirbti?

- Ne Lietuvoje
- Lietuvoje
- Pradėk savo



Unity is hiring

Unity is Hiring

- Kick-Ass
- C/C++
- Kaune
- aras@unity3d.com

Dirbti žaidimų
pramonėje

Kodēl verta?

- Get to work on games!
- Ļdomu, nenuobodu ir daug iššūkių
- Kartais :)



Jèga!

Kodēl neverta?

- Darbas su kompiuteriais



Kodėl neverta?

- Darbas su kompiuteriais
- Nedaug pinigų
 - Dažniausiai
- Daug darbo
 - Dažniausiai

Susiję darbai

- Middleware
- Įrankiai
- Geležis (CPU, GPU, ...)
- Research
- ...

Tai jau kaip jau ir jo



Klausimai?