

Setting your Wii free

*Looking into extending the capabilities
of your aging Nintendo Wii console*

Dag Wieërs - dag@wieers.com

Who is Dag Wieërs ?

- **Community**

- Started using Linux at university (1994)
- RPM packaging: RPMforge (2002), ELRepo (2009)
- Author of dstat, mrepo, wiipresent, unoconv, ...
- Involved in: CentOS, proxytunnel, ReaR,...

- **Professionally**

- 5 years Linux consultant at IBM Belgium
- Now: Dagit Linux Solutions, Ghent, BE
- Work for various international companies: advice, design, automation, maintenance

History of Wii hacking

- Nintendo first released November 2006
 - Since release sold 76 million consoles
- 24C3 in December 2007 first hacks for the Wii
- Team Twiizers uses glitch in Legend of Zelda
 - Twilight Hack smashed stack by using pony name
- Homebrew becomes haven of free development
 - Making things easier for users and developers
- Bootmii takes over the Wii before booting
 - But modifies the Wii permanently
- Custom IOSes add functionality

Known exploits

- ~~Legend of Zelda: Twilight Princess~~ (*twilight hack*)
 - Works up to System Menu 3.4, not on 4.0+
- Bannerbomb (game-less)
 - Works up to System Menu 4.2, not on 4.3+
- LEGO Indiana Jones (*indiana pwns*)
- Super Smash Bros. Brawl NTSC-U (*smash stack*)
- Yu-Gi-Oh 5D's Wheelie Breakers (*yu-gi-owned!*)

Wii developers stated they have more exploits ready but will only make them public when needed...

Short guide: requirements

- Exploitable game disc, eg. LEGO Indiana Jones
- Crafted savegame, eg. Indiana Pwned (EU)
- SD card \lesssim 2GB
 - SDHC might not work
- Hackmii installer
- Internet connection
 - Not mandatory, but easier when installing IOSes !
- Optionally custom IOSes
 - Adds USB 2.0, DVD support and much more...

Short guide: workflow

- Prepare the SD card
 - Copy the hackmii installer as /boot.elf
 - Copy the savegame in place in /private
- Perform some game workflow
 - Copy savegame from SD to Wii
 - Start game in Wii and load the savegame
 - Do something specific to activate the exploit
- Follow instructions to install Bootmii and Homebrew
- Install IOSes and apps from Homebrew browser

Nintendo does not like it

- Scare people from making modifications
 - Every update and game contains warnings
 - Threaten with voiding warranty
- Try to undo known modifications with updates
 - Removing (known) custom IOSes
 - Removing Homebrew
- Fix known holes and prevent new copies
 - Disabling certain exploits in the system
 - Block certain read/copy payloads

Be careful !

- Don't update System Menu blindly (stay with 4.2)
 - Disable automatic updates
 - When updates appear, first consult the Internet
 - If there's no functionality loss, don't update
 - New games *may* update System Menu automatically
- Make it harder to undo
 - Install custom IOSes into different # slots
 - Use bootmii to make it (more) permanent
- Take insurance
 - Buy one of the exploitable games !

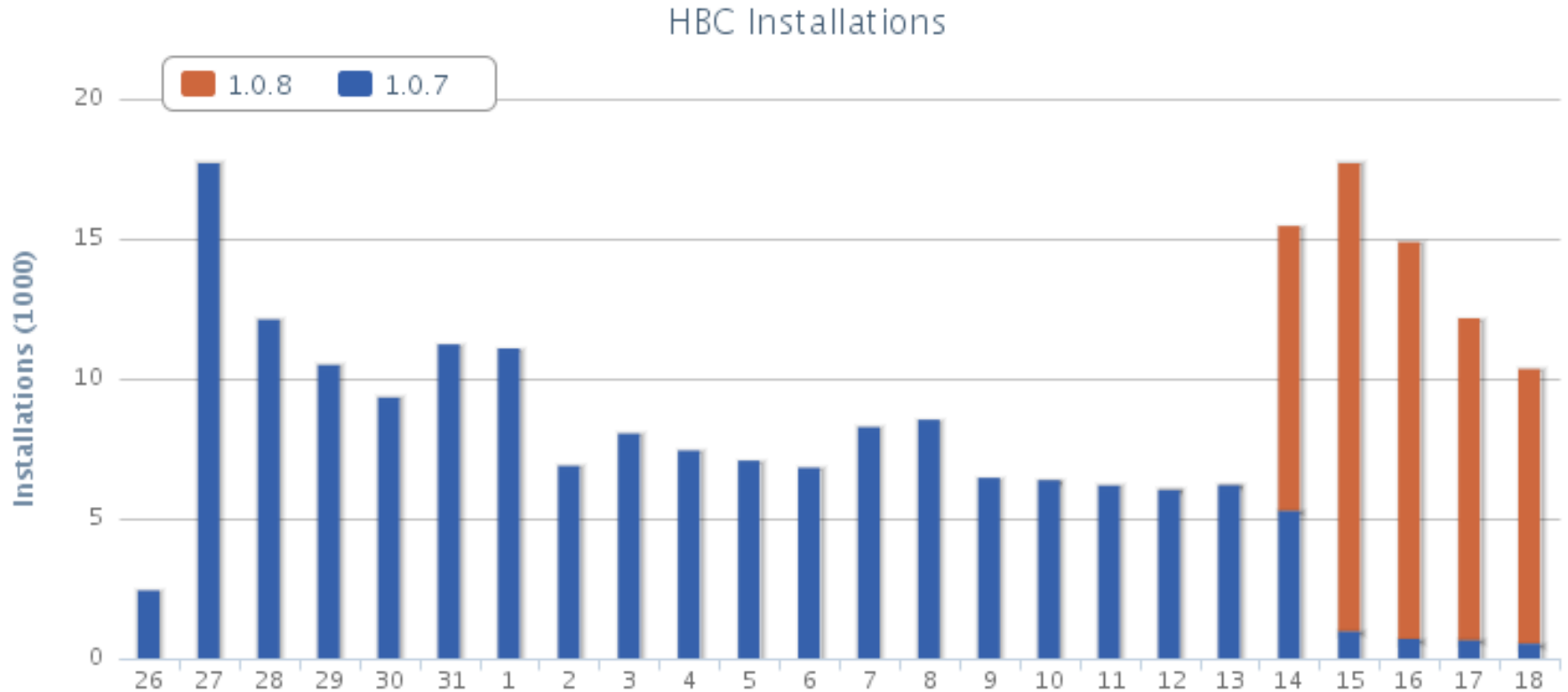
Improved functionality

- Mediacenter with network access through WiiMC
- Play DVDs and DiVX movies through WiiMC
 - Not CDs, as hardware is incapable
- Backing up games and playing from hard drive
- About 500+ Open Source games and tools
- About 25+ console emulators
 - Plenty of old games are available from the Internet
- Whiteboard application

Homebrew channel and browser

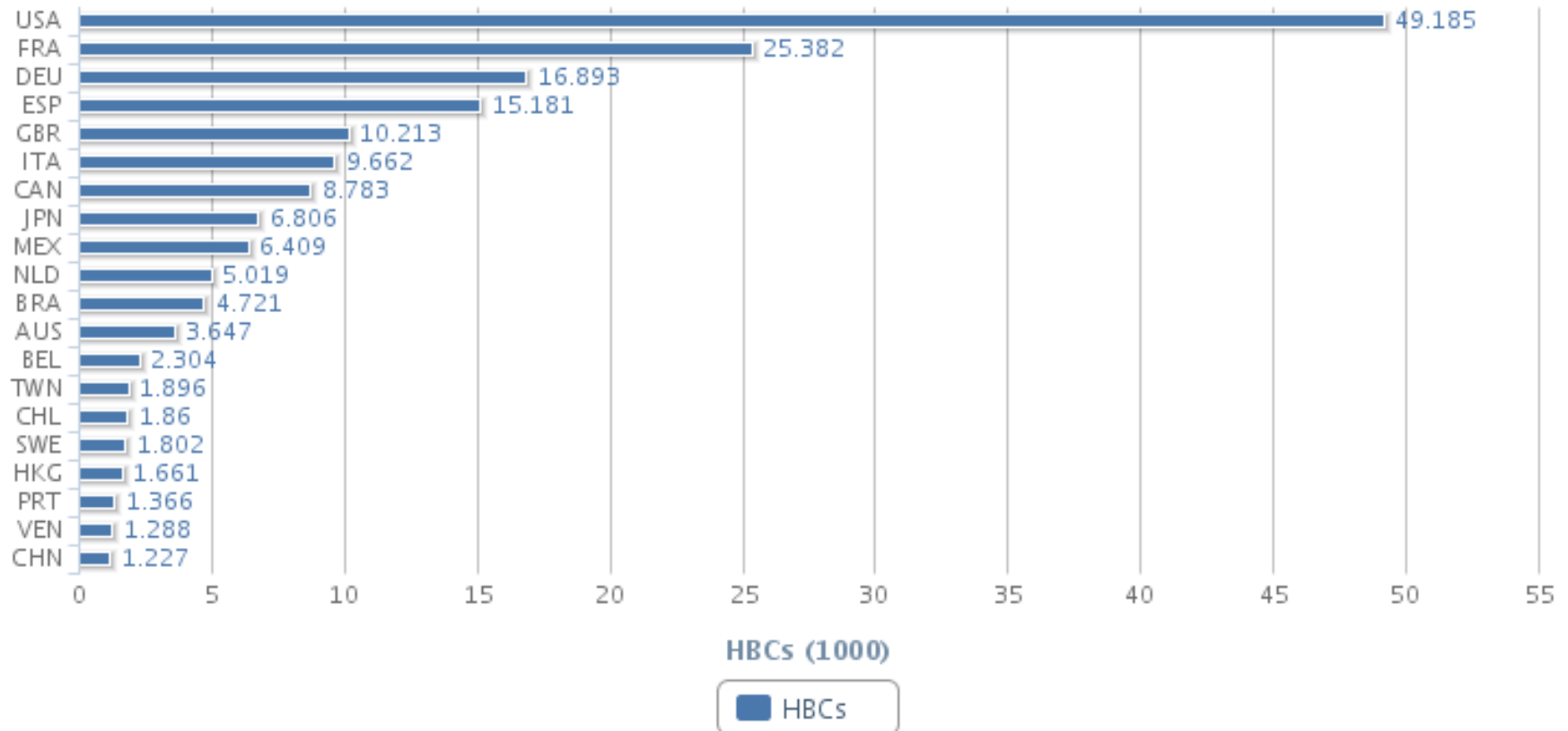
- Homebrew channel
 - Tool to launch other games and tools
- Homebrew browser
 - Helps with browsing, downloading and updating
 - Ability to sort and rate games
- SD content
 - */apps/application/* - application directories
 - */private/* - Nintendo savegame directory
 - */wads/* - Wii archived channels

Homebrew installations



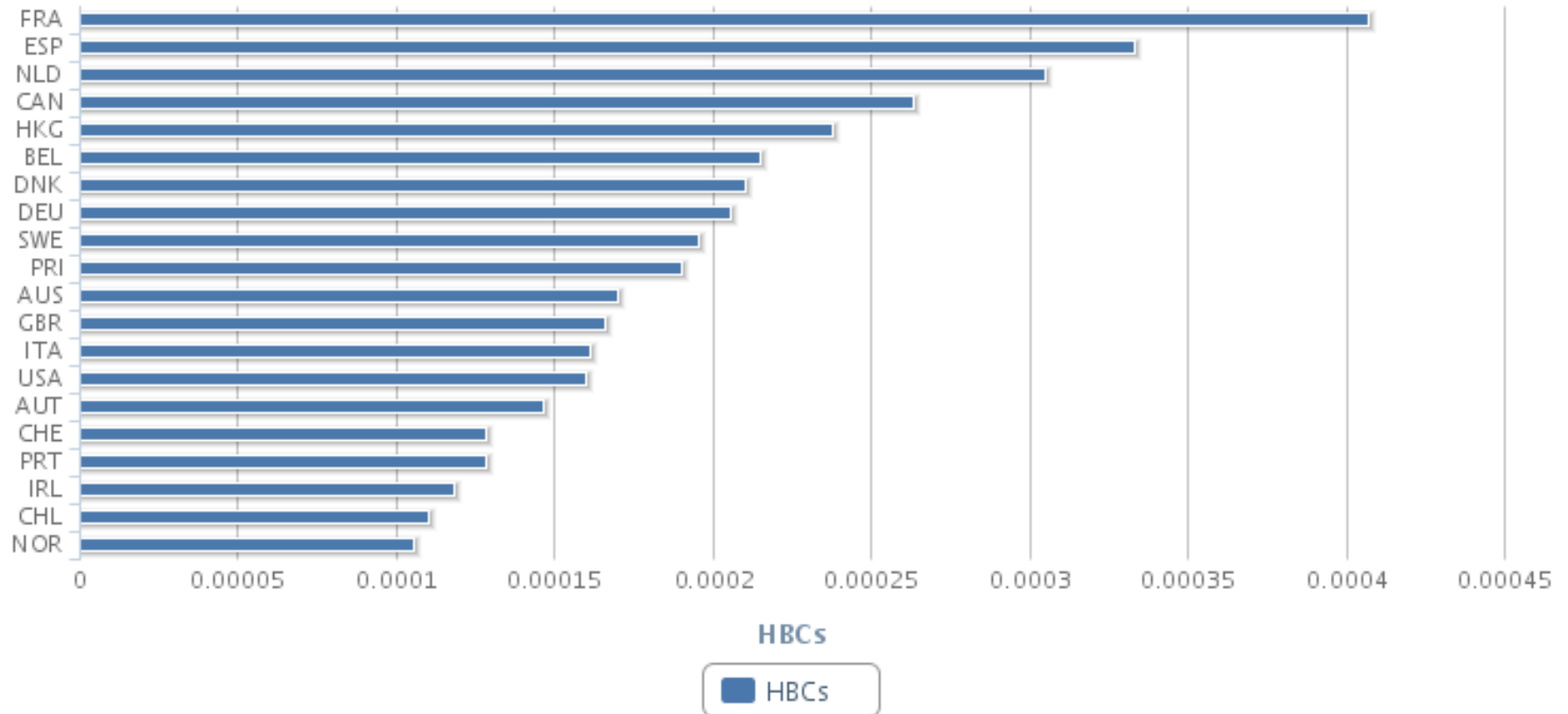
Homebrew usage per country

Top 20 countries



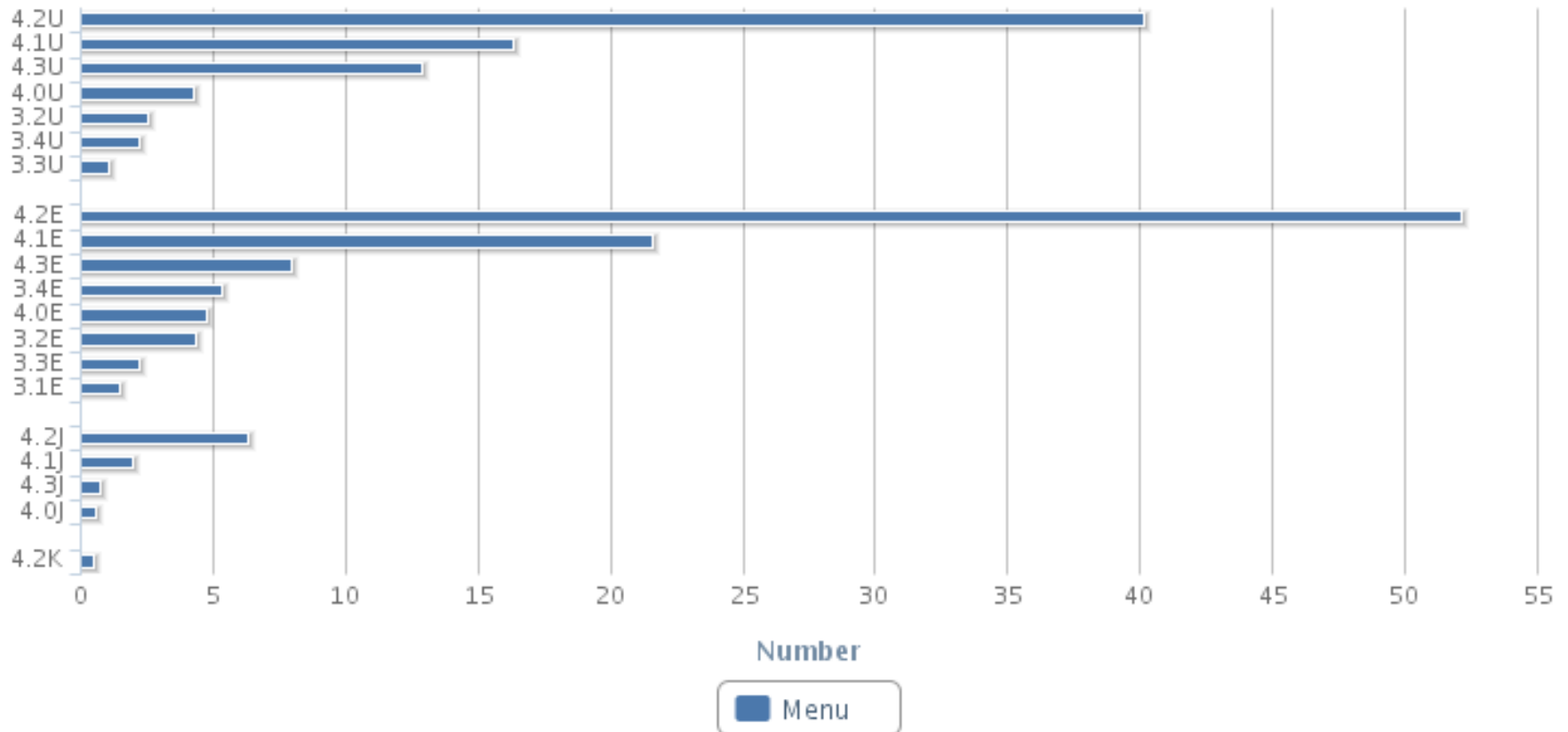
Homebrew usage per capita

HBCs per capita



System Menu deployments

Top 20 system menus



WiiMC – media center

- Ability to play virtually any video or audio format
- DVD playback, with DVD menu support
- Slideshow picture viewer
- Music player
- Online media support
 - Including SHOUTcast, YouTube, and Navi-X
- Supports various storage backends
 - DVD, SD, USB 2.0, SMB, HTTP, and FTP support

USB hard drive backups

- Allow to archive game discs to USB hard drive
- Allow to play archived games from USB hard drive
- Automatically download artwork and information
- Updates through interface
- Supports WBFS, FAT and NTFS
- **Don't use this for *illegal* purposes !**

- Configurable USB Loader (preferred)
- USB Loader GX (backup)

Other tools

- **WiiMC** –*media center*
- Mplayer CE –*video player*
- Configurable USB Loader or USBLoader GX
- AnyTitleDeleterMOD –*modify internal structures*
- WAD manager –*install custom channels*
- Wii Explorer –*File manager*
- **WiiEarth** – *browse the earth using a wiimote*
- WiiVNC – *VNC viewer*
- GeeXBox –*Linux-based media center*

Fancy games (1)

- Balls of Steel –*platform game*
- CombatWii –*multiplayer tank shooter*
- **Eeeek! Eeeeek! Hooooook!!!** - *platform game*
- Giddy 3 –*platform game*
- JellyCar Wii –*platform game*
- Jump 'n Bump –*multiplayer platform game*
- MyLittleBall –*fast platform game*
- Nanomechas –*multiplayer mecha shooting game*
- OpenTyrian –*rail shooter game*

Fancy games (2)

- **Project GMC** –*2.5D platform game*
- RedSquare –*action puzzle game*
- **ShootMii** –*tank ballistics game*
- **Smashing!** –*multiplayer shooting game*
- StillAliveWii –*2D portal platform game*
- YahtzWii –*classic yahtzee game*

Simple games

- Avoidance –*avoid being hit by blocks*
- Ballion –*destroy blocks with a ball*
- Bash the Castle –*swing rocks to destroy the castle*
- Centipede –*classic shooter*
- Freecell Wii –*classic freecell game*
- **Komopong** –*classic pong game*
- PiX Dash –*simple platform game*
- **Pixel Plot** –*simple platform game*
- Zerace –*retro racing game*

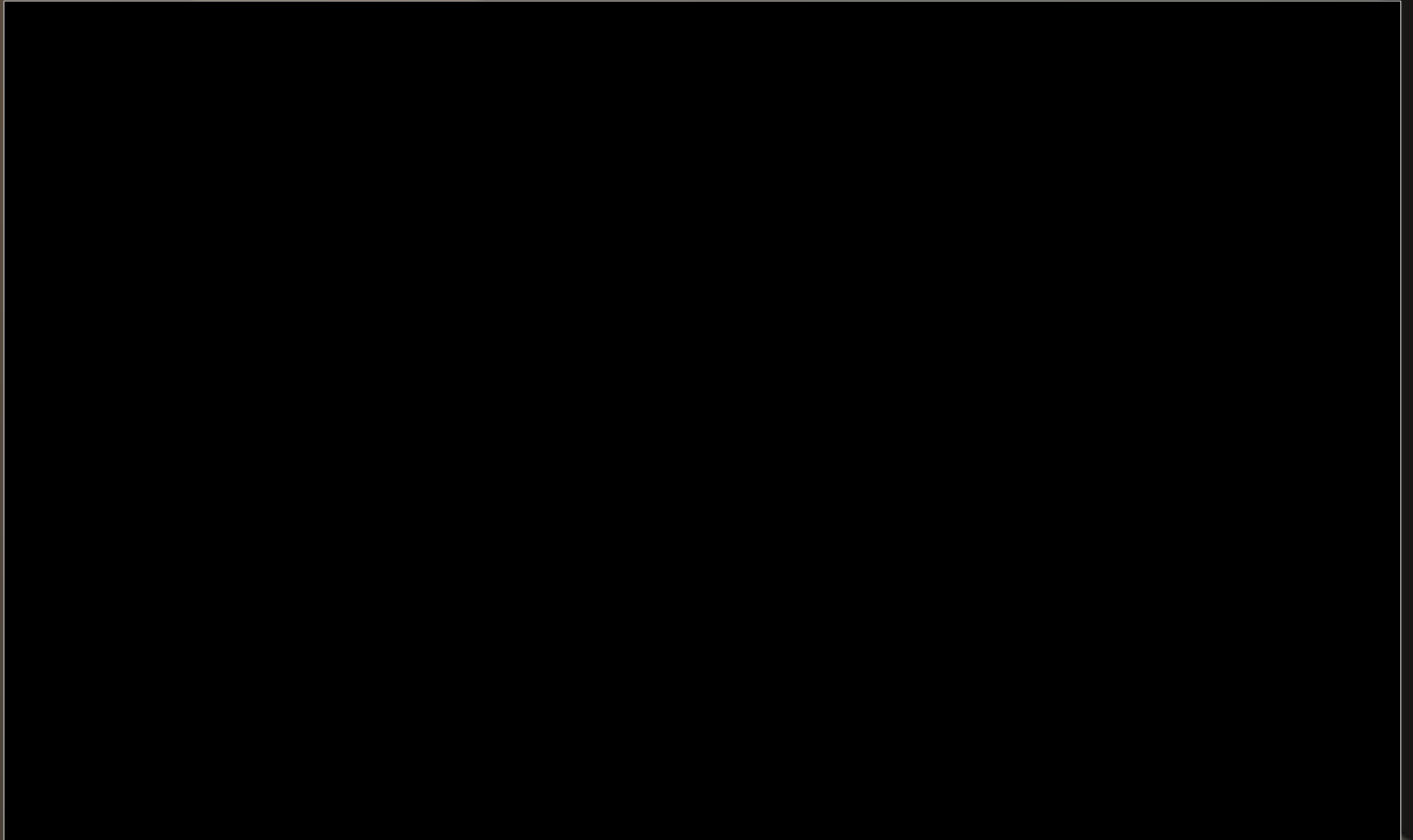
Educational games (1)

- Automati –*game of life*
- DarkCube –*smart game*
- Fridge magnets –*what the name says*
- Gravitii –*try to hit the target despite gravity*
- **Gravity glide** –*experiment with attraction/repulsion*
- **Harmonium** –*experiment with rhythm and sounds*
- Hexxagon –*classic board game*
- Italian parking –*puzzle game*
- Jewels –*puzzle game*

Educational games (2)

- **Kidspaint** *–painting program for kids*
- PixelMerge *–difficult puzzle game*
- Psykotrope *–puzzle block game*
- Rezerwar *–puzzle pipe game*
- Scogger *–puzzle frog game*
- Simon *–classic simon game*
- SpaceBubble *–puzzle bubble game*
- Sudoku 2 *– classic sudoku game*
- **WiiPhysics** *–experiment with physics*

Demo



Thank you for listening

Any locked Wii's in the audience ?

- Wii Homebrew tutorials - <http://gwht.wikidot.com/>
- Bootmii installer - <http://bootmii.org/download/>
- Interesting Wii blog - <http://hackmii.com/>
- Homebrew information - <http://wiibrew.org/>
- Homebrew browser info - <http://codemii.com/>