

# learn network inspire

Game Developers'  
Conference

08



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San Francisco

[www.gdconf.com](http://www.gdconf.com)



# Automatic Audio in Frostbite

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EA – DICE

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# Agenda

- Frostbite vision
- Automation in Bad Company
- HDR audio principle



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# Vision

- How long is your game?



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# Vision

- To make it ever more challenging:
  - Sandbox experience
  - Open ended gameplay
  - Tactical destruction



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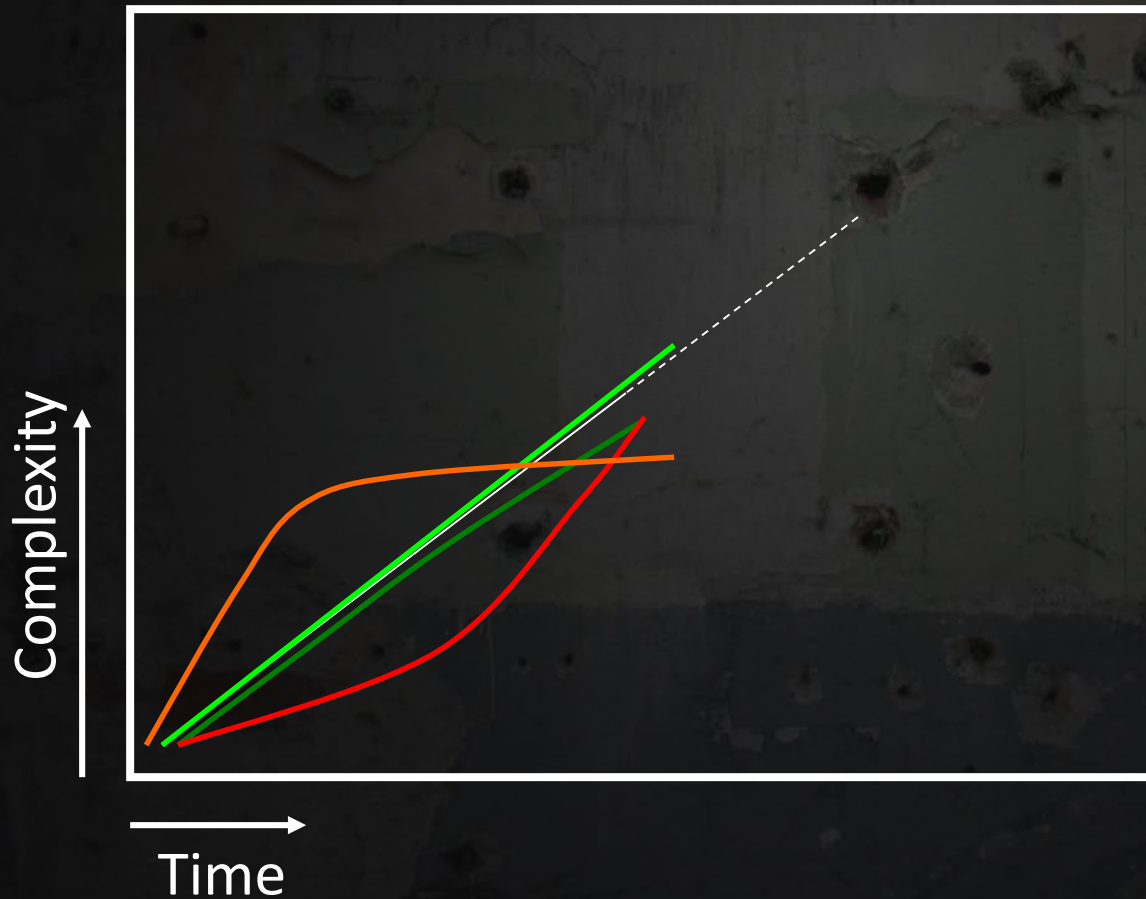
# Vision

- Games are fundamentally different
- Automatic Models are needed



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# Complexity



Manual result

Automatic result

Manual effort

Automatic effort





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Frostbite



**FROSTBITE™**  
A DICE TECHNOLOGY





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# Frostbite

frostED

File View Edit Tools Window Help

Database Explorer

Database

Simple View No Filter

- Impulse\_Responses
- MAOTSM
- MP\_VO
- Music
- Radio
- Reverb
- UI
- Weapons
  - Deploy
  - Distant\_OneShots
  - Far\_Off\_Bursts
  - Far\_Off\_OneShots
  - Handheld
    - AT\_Mine
    - AutoInjector
    - BU\_Img\_M60
      - BU\_Img\_M60\_Fire
      - BU\_Img\_M60\_Fire\_Close\_Wave
      - BU\_Img\_M60\_Fire\_Distant\_Wave
      - BU\_Img\_M60\_Fire\_LFE\_Wave
      - BU\_Img\_M60\_reload\_1p\_Wave
      - BU\_Img\_M60\_reload\_3p\_Wave
    - BU\_Img\_MG3

Properties

Misc

MaxInstanceCount	16
Loudness	110
AltLoudness	-1
ObstructionRadius	1
DopplerFactor	1
LFEloudness	-6
DialogLoudness	-6
ReverbLoudness	-16
MasterPitch	1
Name	Sound/Weapons/Handheld/BU_Img_M
ObjectId	BU_Img_M60_Fire

Type: SoundTemplate

BU\_Img\_M60\_Fire

Name	Default Value	Type
IsFirstPerson	0	Parameter
IsUrban	0	Parameter
Start	0	Event
Stop	0	Event

Loudness: 110

AudioEditor



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# Bad Company

1. Perceived loudness (HDR)
2. Interaction Points (Weapons, Vehicles)
3. Counteract repetition

These were our 3 primary focus areas



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# Bad Company

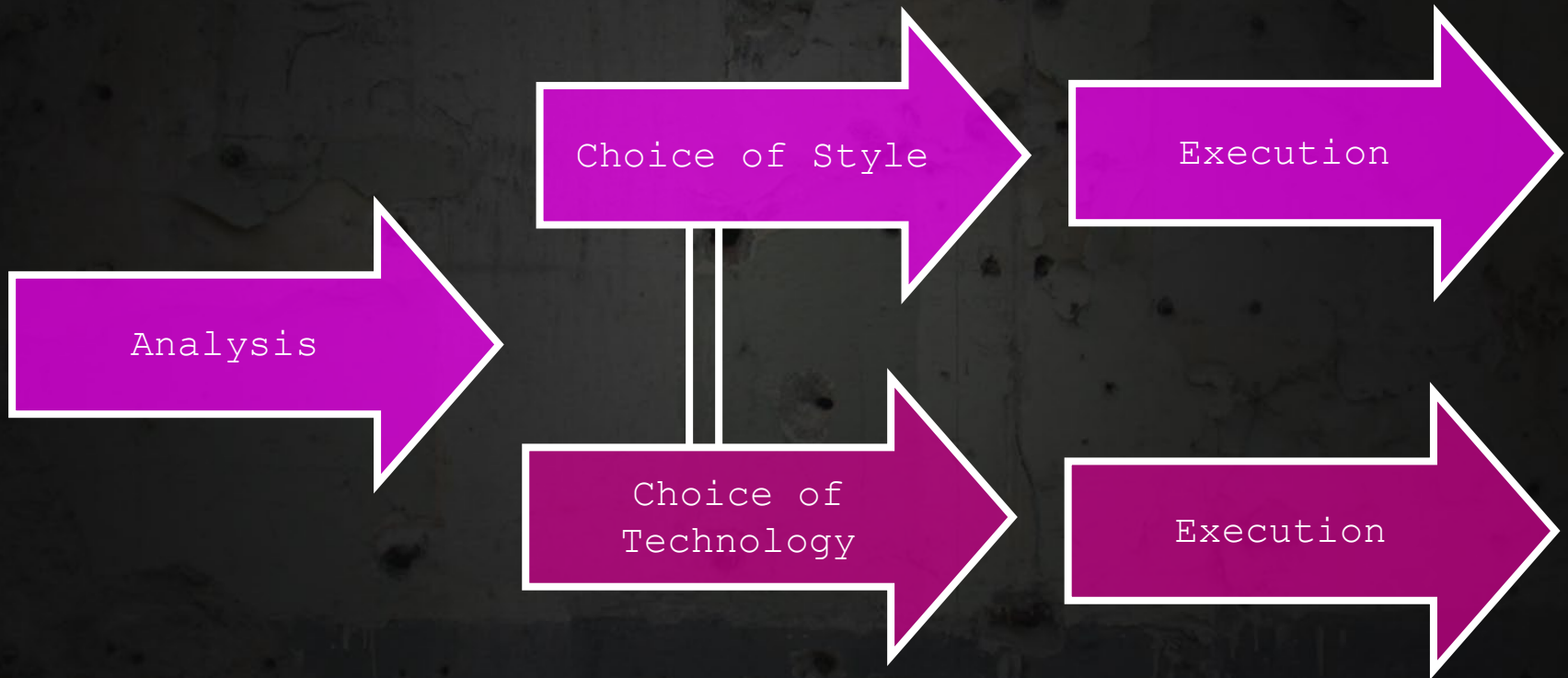
The complete  
experience





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# Process





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# Primary Interaction

How many times does a player fire in a 10 hour shooter?

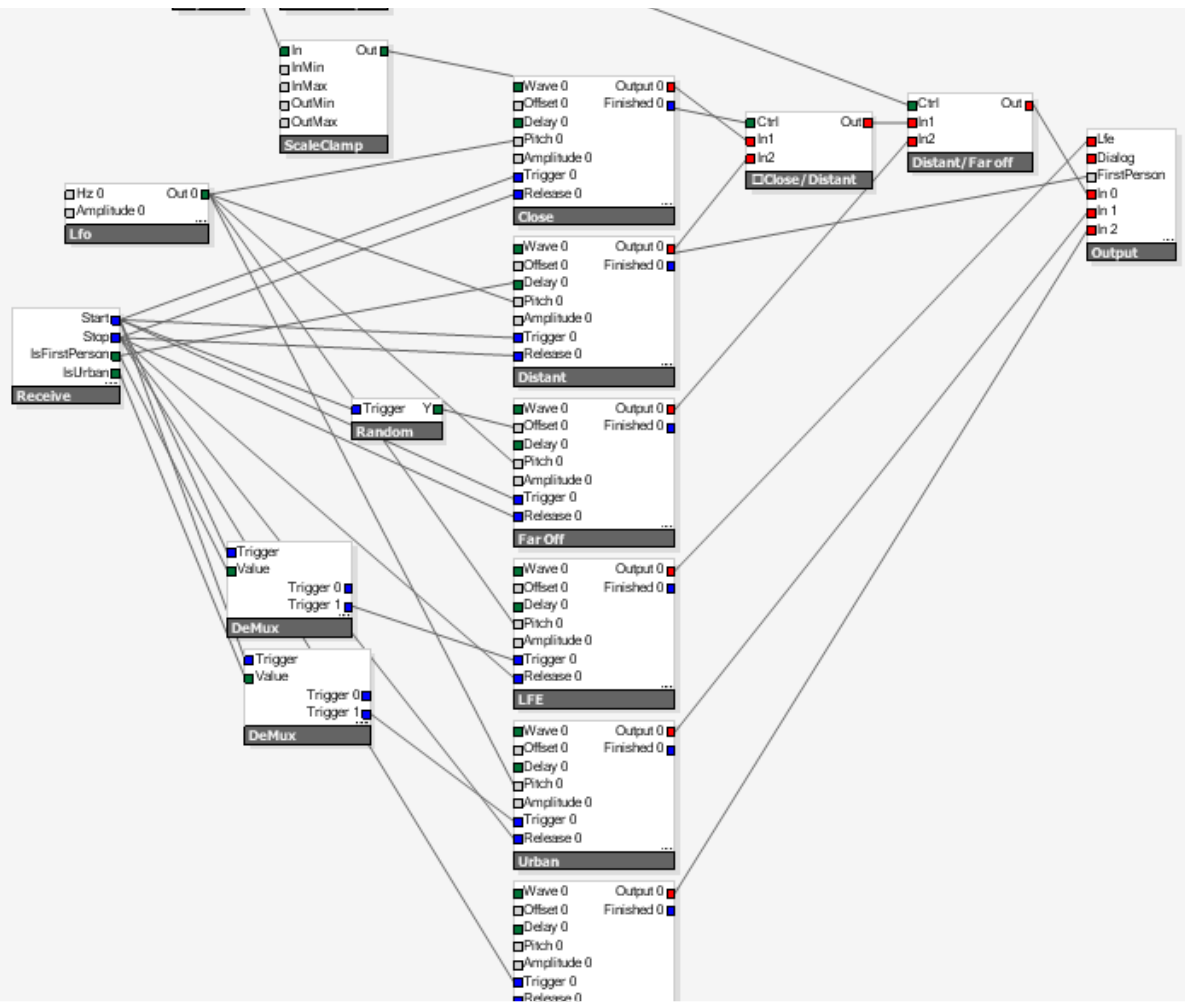




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# Weapon Design

Name	Default Value	Type
IsFirstPerson	0	Par.
IsUrban	0	Par.
Start	0	Event
Stop	0	Event







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# Sound Design





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# Sound Design

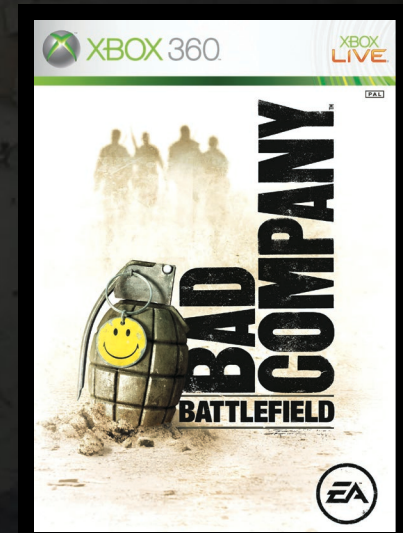
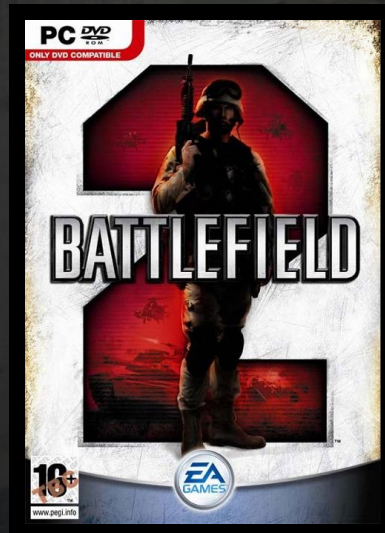
STYLE OF SOUND

-what color is your game?



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# Comparison Examples





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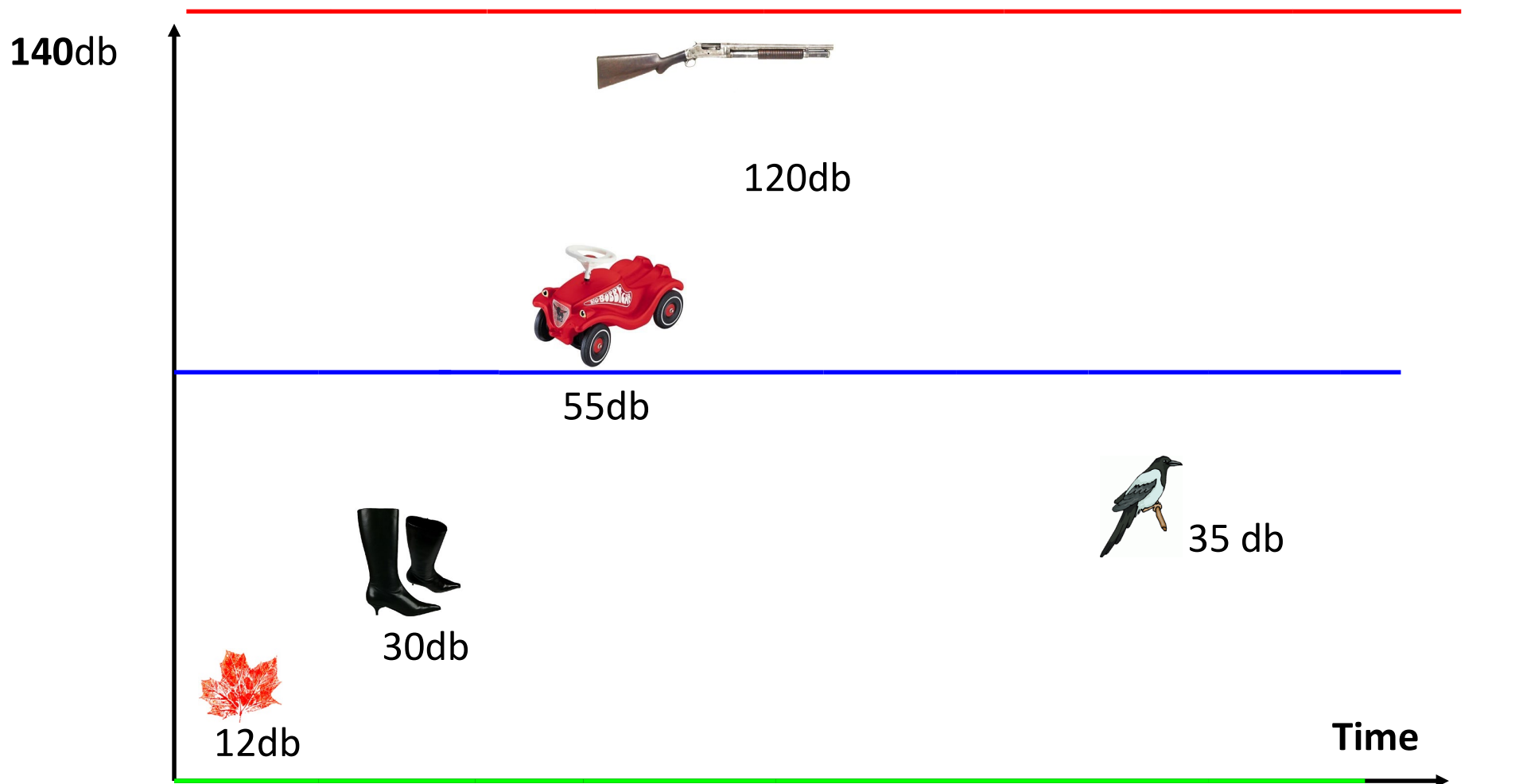
# HDR Audio

- Automatic Mixing
  - Prioritizing sound sources
  - Makes Battlefield moments sound good



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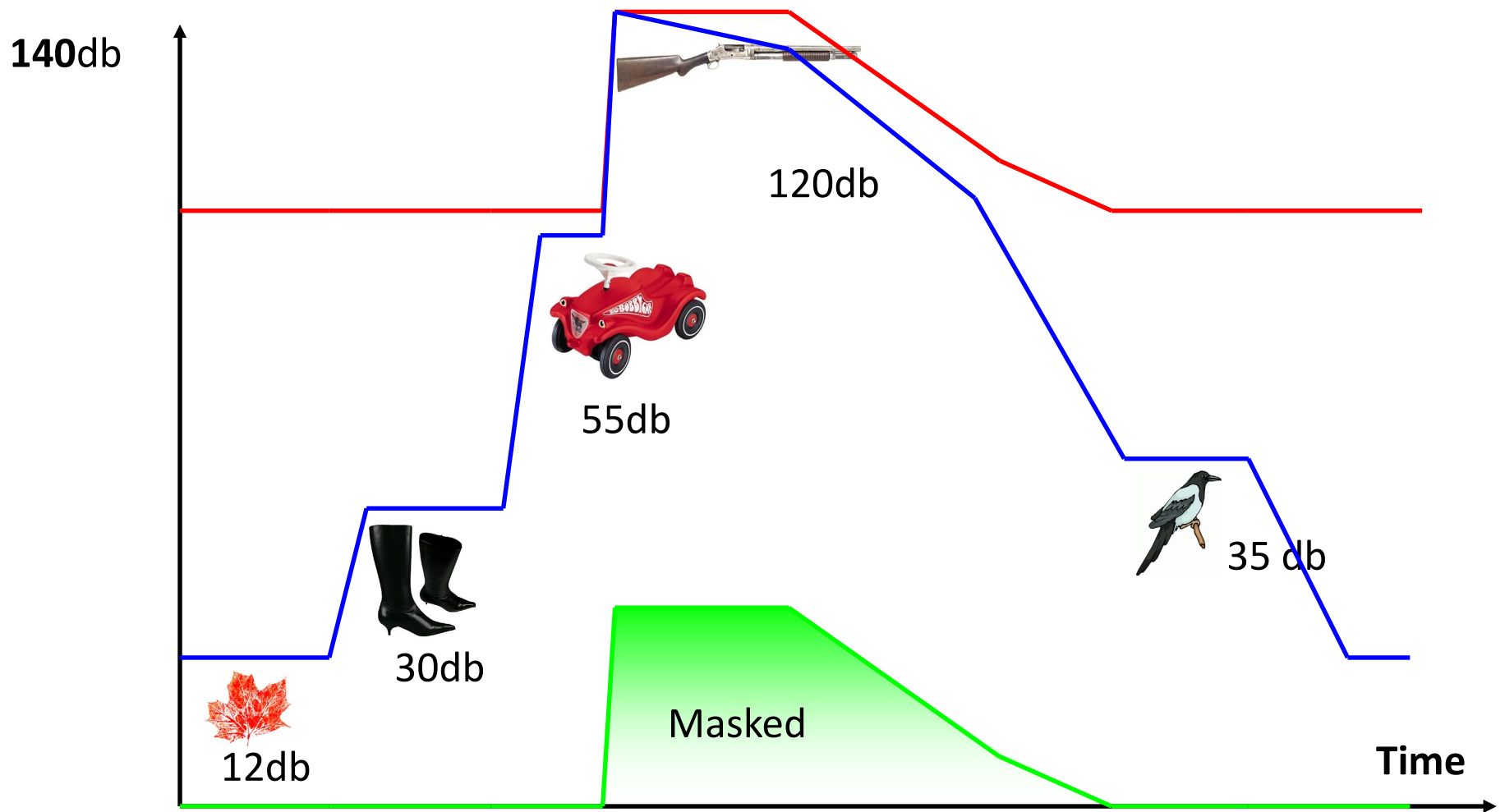
# HDR off example





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# HDR on example



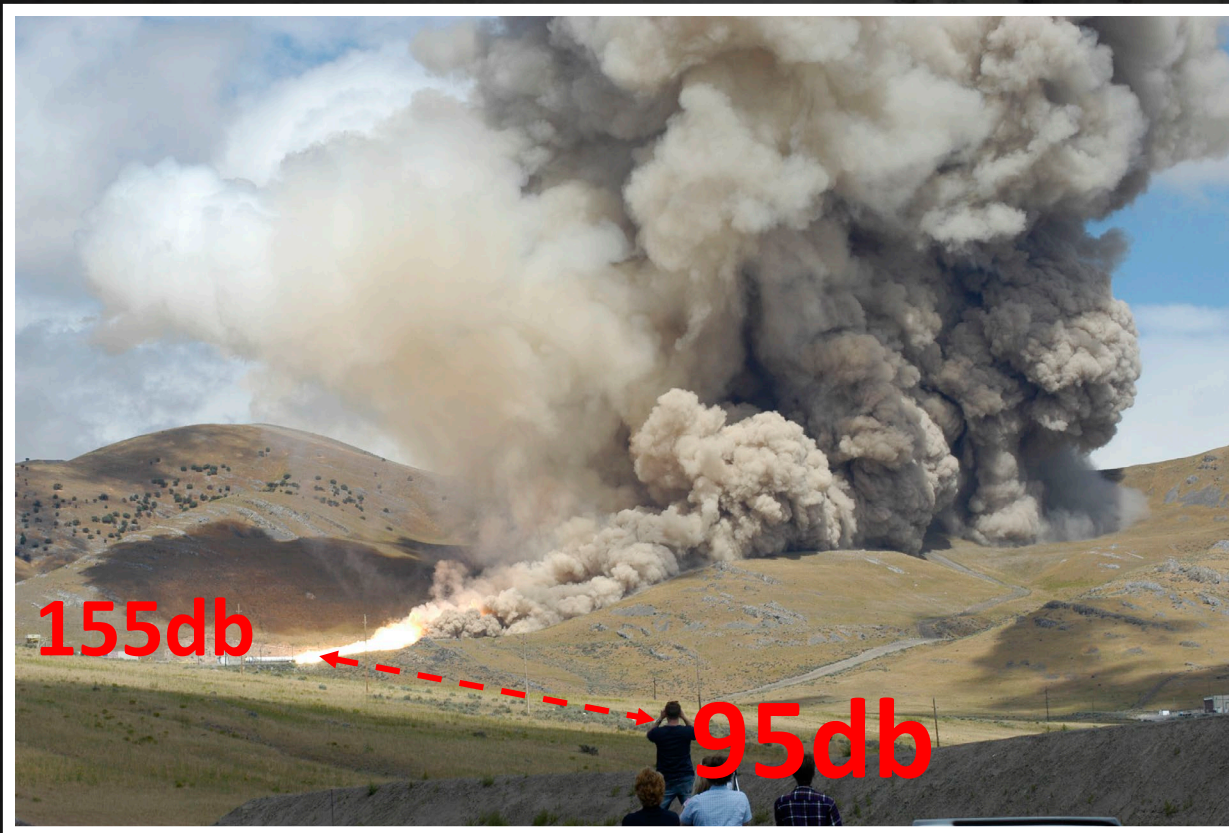




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# HDR Audio – Theory

- Measure loudness at listener position –  
Scale all sound sources accordingly





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# HDR Audio – Theory

- Handle the dynamic range from the quietest sound noticeable to the pain threshold





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# HDR Audio – Theory

- Functions similar to HDR lighting





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# HDR Audio - Reality

- HDR Audio functions as a culling algorithm
- Loudness is a good approximation for 'importance' especially in FPS game







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# HDR Audio FAQ

- HDR Audio is not compression, all sounds are played uncompressed
- The effect is sometimes similar to compression

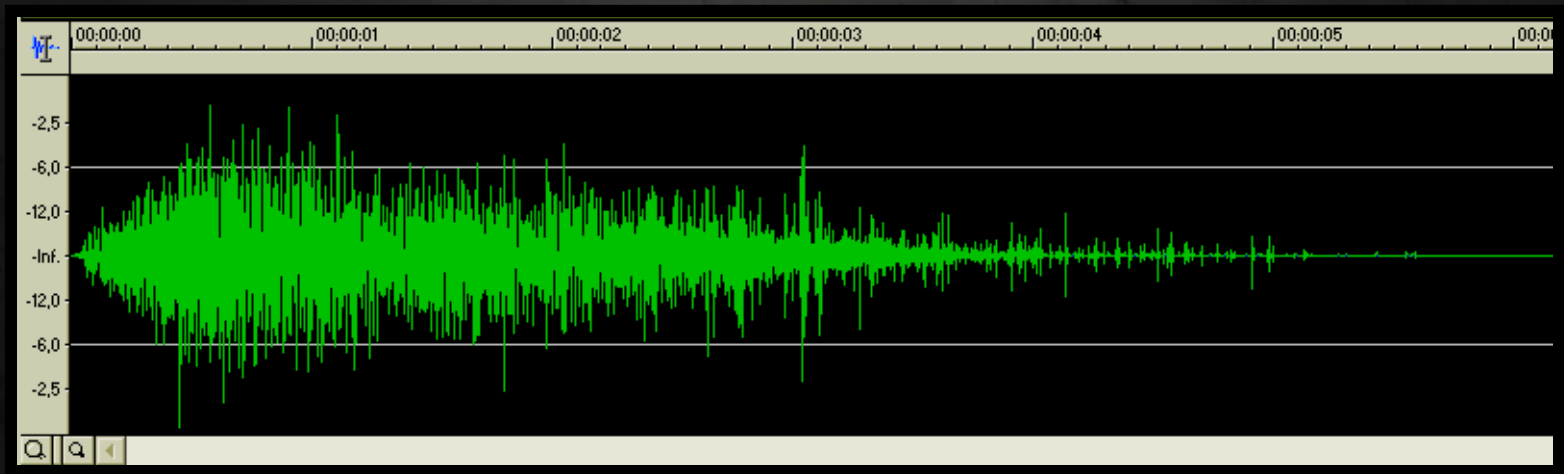




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# HDR Audio FAQ

- HDR Audio works on logical loudness values and does not touch the actual audio waveform







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# Bad Companyy

Battlefield: Bad Company™

Run Time Demo



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# Summary

- Automatic Systems will make the game sound better
- and the work more fun
- We have done a few
- Hope you got inspired!



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# Sounds Interesting?

- We are always looking for talented and devoted persons to join our audio teams
- [jobs.ea.com](http://jobs.ea.com)



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# Questions

Who has the first question?



# Thank You

⌂ Please, fill out the questionnaire