

Confronting the Audio Nemesis in Middle-earth: Shadow of Mordor

Maximizing Emotional Resonance in an Open World Environment



Brian Pamintuan
Michael Berg
Nathan Grigg

Who Are We?

- Brian Pamintuan – Director of Audio
 - *Overall Approach & Legacy Techniques*
- Michael Berg – Senior Audio Engineer
 - *Technical Strategy*
- Nathan Grigg – In-House Staff Composer
 - *Music Content & Structure*

Maximizing Emotional Resonance

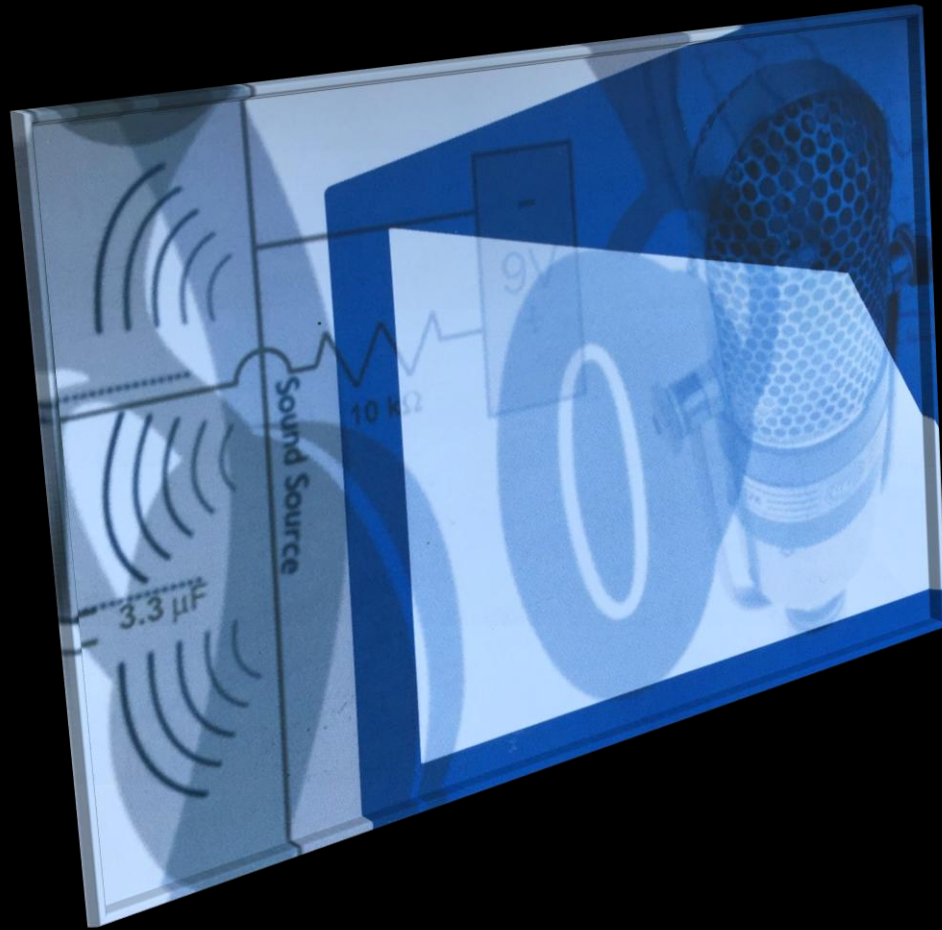
What does this mean?

- Drive EMOTION as a pillar
- Maximize previous development techniques
- Experiment to make the player FEEL



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Audio Team Size

- 1 Director of Audio
- 2 Sound Designers
- 1 Composer
- 1 Audio Engineer
- 1 Audio Producer
- 2 Contractors
- 5 Dedicated Audio QA

FEAR

FIRST ENCOUNTER ASSAULT RECON

F.E.A.R. 2

PROJECT ORIGIN™

20

MONOLITH
YEARS

1994-2014

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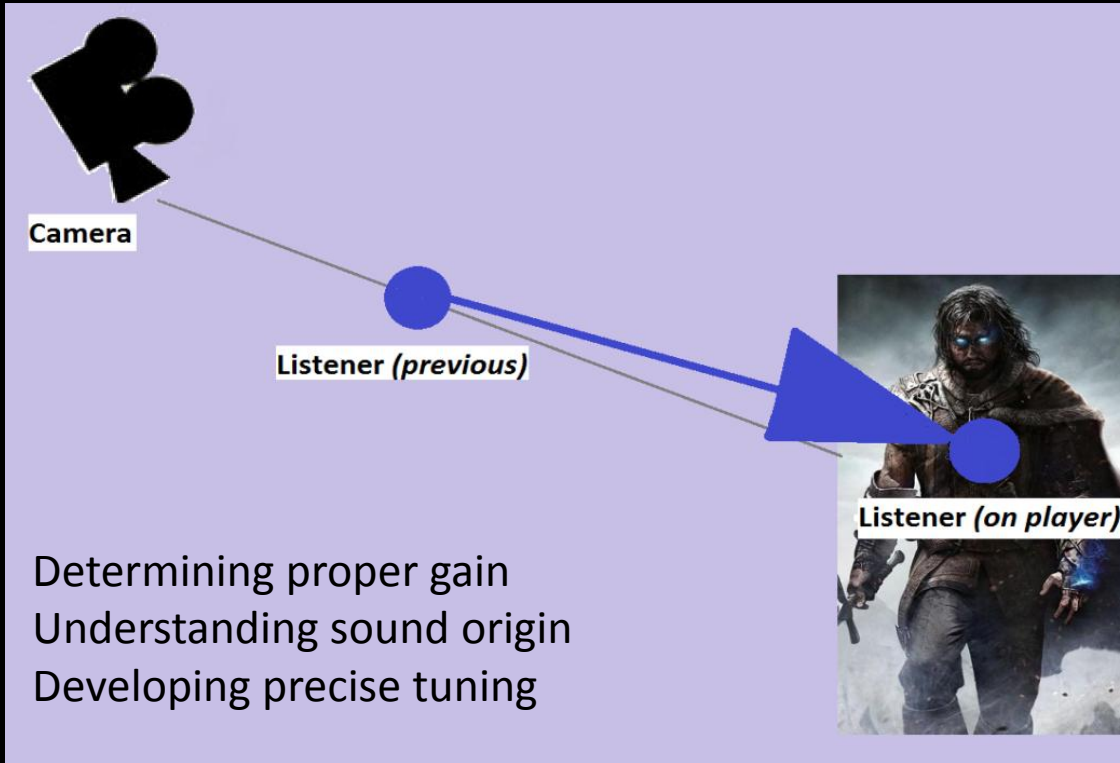
How do we get the player to feel
connected to Talion?



How do we get the player to feel connected?

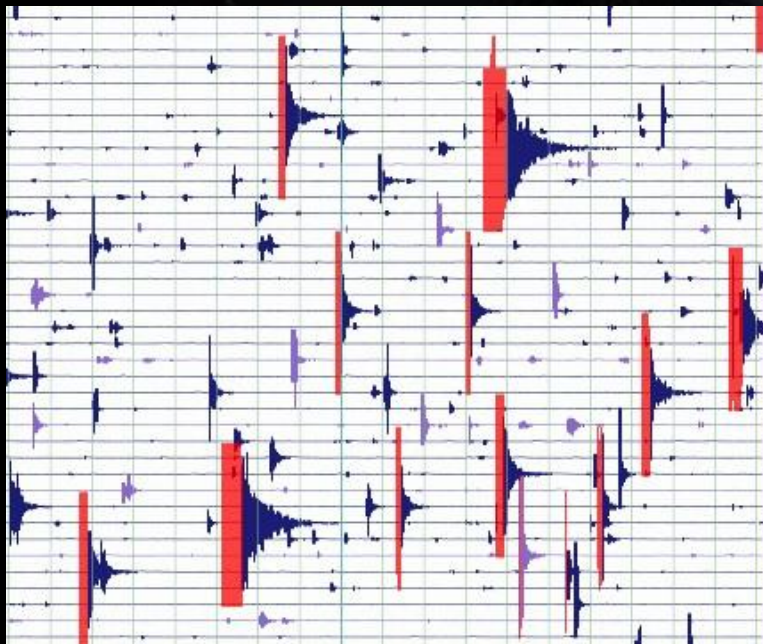
- Listener Position
- Dynamic Spikes
- PS4 Controller Speaker
- Music Combat
- Nemesis Showdowns

Listener Position



Dynamic Spikes

- Audio ducking
- Slow-motion camera
- Pre & Post sfx



Dynamic Spikes

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PS4 Controller Speaker



Music Combat

- Legacy technique from Condemned
- Music stingers on impacts/whooshes
- Immediacy, urgency in melee
- Connection to Uruk captains

Music Combat

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Nemesis Showdowns

- 1st person camera
- Conditional dialog
- Microphone technique & processing

Monolith's Approach

- Focus on emotion
- Leverage experience
- Iterate to quality



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Conditional Audio – Overview

- Focus on emotion
- Process a ton of dialog
- Tackle a Sandbox world
- Support the Nemesis possibilities

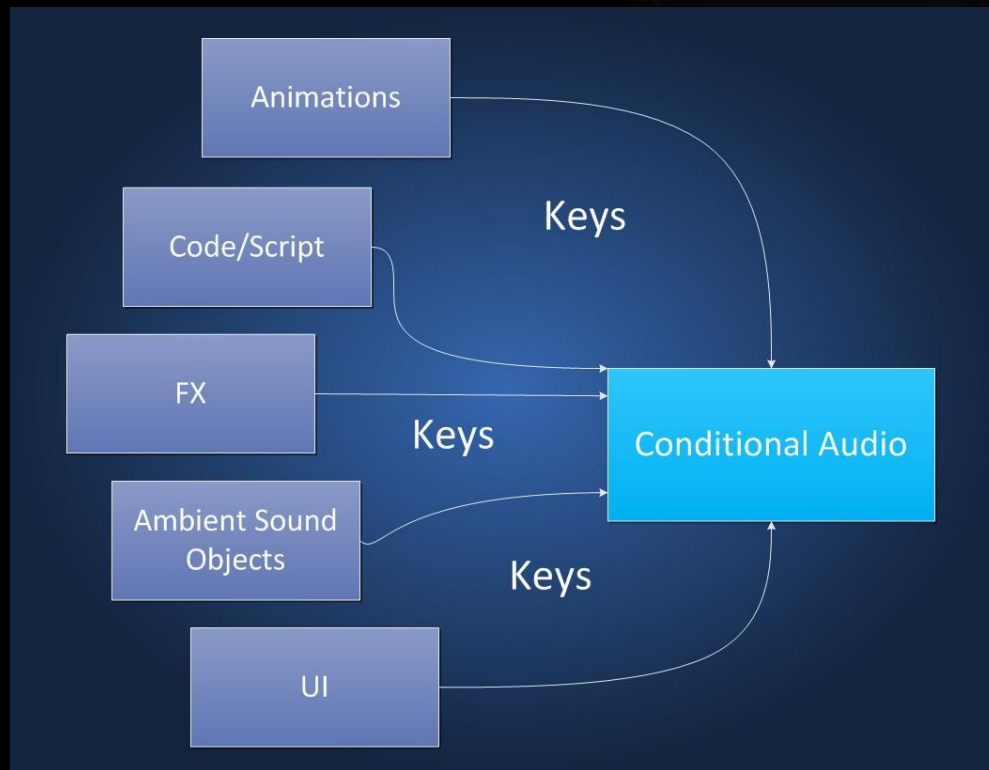
Conditional Audio – Inspiration

- Build on event-based sound engines
- Follow the game team's approach
- Learn from previous GDC dialog talks:
 - GDC 2012, “AI-driven Dynamic Dialog through Fuzzy Pattern Matching. Empower Your Writers!” by Elan Ruskin (Valve)
 - GDC 2014, “Context-Aware Character Dialog in *The Last of Us*” by Jason Gregory (Naughty Dog)

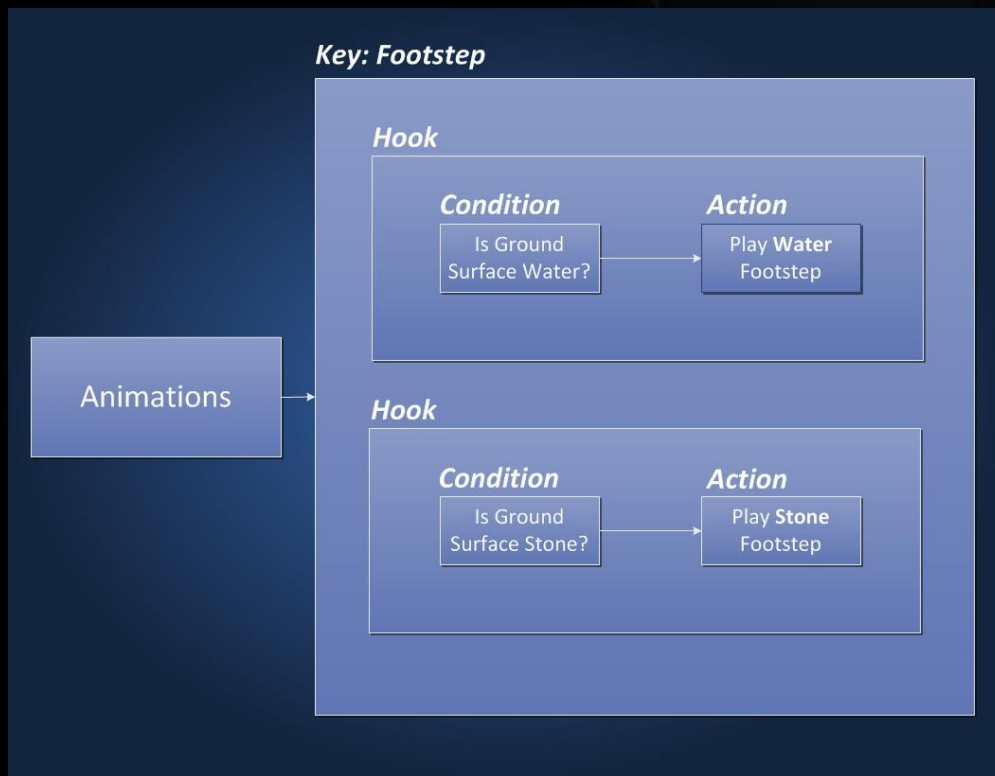
Conditional Audio - Overview

- Data defined system
- Audio logic moved into content
- Centralized game database

Conditional Audio - Keys



Conditional Audio – Other Data



Conditional Audio – Other Data

- Hooks
 - Contain a list of conditions and actions
 - Execute the actions, if all conditions true
- Conditions
 - Support game and variable conditions
- Actions
 - Post a sound event
 - Play facial/body animations
 - Set a variable

Conditional Audio – Showdown

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Conditional Audio – Showdown

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Conditional Audio – Efforts

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Conditional Audio – Efforts

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Conditional Audio – Rain

Conditional Audio – Rain

Conditional Audio – Benefits

- Faster iteration
- Increased experimentation
- Easier to make changes
- Simpler code
- Cleaner content



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Talking About Music in Two Parts

- Aesthetic Direction
- Structural Feature Support

Aesthetic DNA

- Timbre: Non-traditional source and processing
- Harmony: Sustaining tension through dissonance
- Rhythm & asymmetry

DNA Samples



The Gravewalker



Bright Master



The Gorthaur

The musical score for 'The Gorthaur' is presented for five instruments: Violin I, Violin II, Viola, Cello, and Bass. The score spans measures 22 to 27. The tempo is marked 'agitato' and the dynamics are 'mp' for Violins, Viola, and Cello, and 'p' for the Bass. The Violin parts feature a complex rhythmic pattern with fingerings and counts indicated above the staves. The Viola, Cello, and Bass parts provide a steady accompaniment.

Violin I and II Fingerings and Counts:

| Measure | Violin I Count | Violin I Fingering | Violin II Count | Violin II Fingering |
|---------|----------------|--------------------|-----------------|---------------------|
| 22 | 6 | 3 | 8 | 4 |
| 23 | 5 | 5 | 4 | 4 |
| 24 | 4 | 4 | 4 | 4 |
| 25 | 3 | 4 | 4 | 4 |
| 26 | 2 | 3 | 8 | 4 |
| 27 | 1 | 5 | 4 | 4 |

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| 25 | 3 | 4 | 4 | 4 |
| 26 | 2 | 3 | 8 | 4 |
| 27 | 1 | 5 | 4 | 4 |

The Gorthaur

6 5 4 3 2 1 6 5 4 3 2 1

Vin. I
4 3 5 4 3 5 4 3 2 1
OVERDURI NV mp f

Vin. II
4 8 4 4 8 4 4 8 4 4
OVERDURI NV mp f

Vla.
mf

Cello
div.

Bass

28 29 30 31 32 33 34 35

The Gorthaur

Violin I: *piu agitato*, *mf*. Fingerings: 6, 5, 4, 3, 2, 1, 6, 5, 4, 3, 2, 1.

Violin II: *piu agitato*, *mf*. Fingerings: 3, 5, 4, 4, 3, 5, 7. Performance markings: *div.*, *unis.*, *div.*.

Viola: *mf*. Performance marking: *div.*

Cello: *1/2 section sul pont.*, *f*. Performance marking: *sim.*, *f*.

Bass: *div. a2*, *mf*.

Rehearsal marks: 36, 37, 38, 39, 40, 41.

The Gorthaur

Violin I (Vln. I) and Violin II (Vln. II) parts are marked with a large '7' and '4' respectively at the beginning. The Viola (Vla.) part is marked with a large '7' at the beginning. The Cello part is marked 'ord., div. a2' and 'mf'. The Bass part is marked 'div. a2, pizz.' and 'mp', then 'unis., arco' and 'mf'.

Measures 42, 43, 44, and 45 are indicated by boxes at the bottom of the score.



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The Musical Sandbox

- AI awareness
- AI Types (Creatures vs Orcs)
- Riding themes
- Alarm States

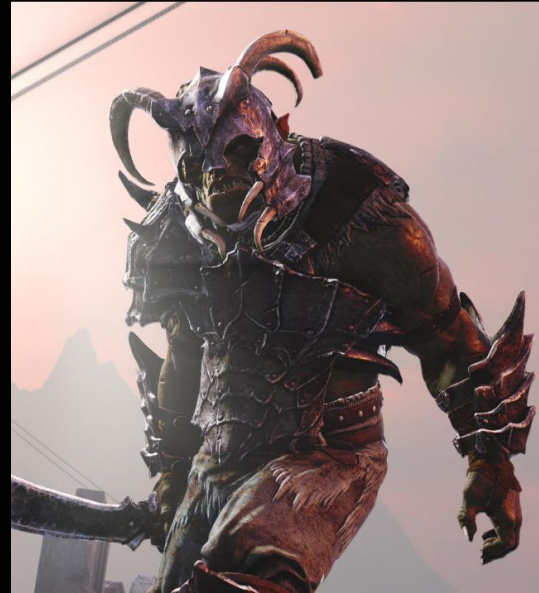
A Day in the Life of Talion

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Warchief Music

- Chanting
- Layered walla
- Tempo synchronization



Warchief Music

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Final Thoughts

- Emotional power from immediacy and depth
- Seizing every moment through flexible structure
- Only then can you truly defeat... the Audio Nemesis

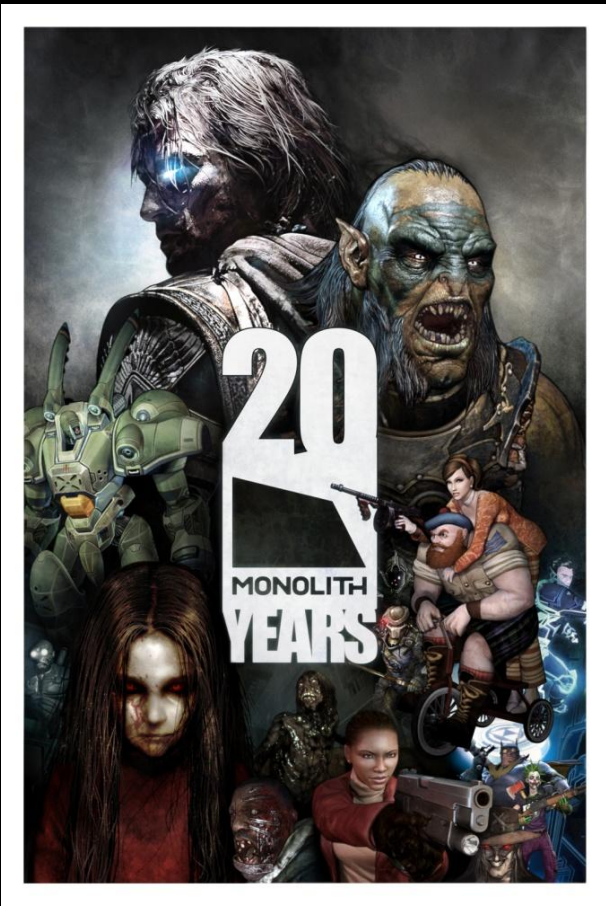


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Questions?



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