

### ③ **Occlusion**

Generally, when the player enters into the building, the reverb is automated by calculating the occlusions within the sound area. However, this is only possible when the event happens inside the architecture, because here the depth is already known. In most situations, the audio team needs to adjust the reverb manually on a case by case basis. Furthermore, in order to make the immersive experience consistent with the narrative, some adjustments must be taken into account—even if it doesn't represent the sound performance in the reality.<sup>116</sup> For instance, when the player goes somewhere that is supposed not to be found by the enemy, the audio team would lower the whole volume to match the obscure atmosphere.

Additionally, Shindo and Kohata have emphasised that their priority is producing “satisfying sounds” rather than “accurate simulation”. ‘The sound team focused on creating an immersive environment that would let players stop in their tracks to enjoy their surroundings’, was addressed by Shindo and Kohata.<sup>117</sup> Therefore, all the sound effects need to be easily recognisable and pleasing instead of mere precise simulations.

### **II-3. Doppler effect : Flight unit, Emil**

The study by Huiberts revealed that the Doppler effect is often added to moving objects in games in order to increase player engagement. For example, ‘the fantastic audio : rockets demonstrate the Doppler effect when they fly past your head’ in the shooter video game *Quake Live* (2009), or the ‘approaching vehicles with added Doppler effect, attract the focus of the user and make concentrating on the boosters more challenging’ in the audio game *Drive* (2002).<sup>118</sup> So, what is Doppler effect ? According to scientist Poessel, the Doppler effect is often referred to as the Doppler shift.<sup>119</sup> A common

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<sup>116</sup> Kamiyama, 【CEDEC2017】 『NieR:Automata』の世界を彩る効果音はどのように実装されたのか？デザインコンセプトとその仕組みについて, *op. cit.*, p.8-9

<sup>117</sup> Shindo and Kohata (2018), *op. cit.*, p.2

<sup>118</sup> Huiberts, *op. cit.*, p.60 and p.80

<sup>119</sup> Poessel, M. (2011). Waves, motion and frequency: the Doppler effect. *Einstein Online*. Band 05–1001. Retrieved from <https://www.einstein-online.info/en/spotlight/doppler/>

example of Doppler shift is the **change of pitch** heard when a moving object (e.g., car, airplane, spaceship) is approaching the observer. In comparison to the frequency emitted from far, the received frequency would be higher when the moving object is approaching ; 'identical at the instant of passing by, and lower during the recession'.<sup>120</sup> This technique is also utilised in 《NieR: Automata》 , especially on the Flight unit and every time the character Emil makes an appearance.

There are two scenes in gameplay 9 which can be cited as clear examples that demonstrate this effect : One is in 16:37–16:40, when 9S comes out of the tunnel by the flight unit, flying toward the screen then leaving off the left side (see Appendix #2). The other is in 26:56–27:02, when 2B and the flight unit take off from the middle of the screen and fly to the left side. Both pitches of their recession sound are apparently lower than when the flight unit first appears and passes by the viewers (players).

Emil is a companion and major character in 《NieR》 , both in the human form and weapon form, whereas in 《NieR: Automata》 he appears as a machine head with no body. His main role in 《NieR: Automata》 is 'attached to a moving sales cart where he offers his wares for the roaming androids of YoRHa'<sup>121</sup>, as seen in Figure 11.<sup>122</sup> In Kohata's public lecture at GDC2018, they confirmed that they added the Doppler effect on Emil's cart, where the player can buy new weapons or tools without returning to Resistance Camp. Whenever he shows up, the theme song of his sale cart, <**12. Emil's shop**>, plays **from his position** in the game world. If the player is fighting against the enemy in City Ruins, the pitch raising and dropping phenomena simulated by the Doppler effect will be heard by the player. Since Emil's cart moves freely by the game setting, the Doppler effect on the song is more obvious when Emil is within the player's sight. Nonetheless, Emil's cart often shows up unpredictably and out of the scene. Even so the player is still able to hear <12. Emil's shop> at a soft volume, which is what we're

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<sup>120</sup> Doppler effect. *Wikipedia*. Retrieved from [https://en.wikipedia.org/wiki/Doppler\\_effect](https://en.wikipedia.org/wiki/Doppler_effect)

<sup>121</sup> Emil (Character). [n.d.]. *NIER Wiki*. Retrieved from Nier Fandom website [https://nier.fandom.com/wiki/Emil\\_\(Character\)#Human%20Form](https://nier.fandom.com/wiki/Emil_(Character)#Human%20Form)

<sup>122</sup> KOS-MOS. (2017). "Emil's Shop :3". *STREAM-NieR:Automata™*. Retrieved from <https://steamcommunity.com/sharedfiles/filedetails/?id=928235607>

going to discuss, as the last factor which establishes the "Feeling of PRESENCE"—the Audio-only asset.



Figure 11. Emil's shop in City Ruins with 2B (left) and 9S (right)

### III. Audio-only asset

Huiberts identified that the 'audio is very suitable for presenting time-based information with the advantage that the information is perceived even though the player is not immediately next to the source'.<sup>123</sup> This is consistent with the findings of Jørgensen, which show that the orienting functions of game audio can 'provide information about the presence of objects as well as the direction of sound sources. [...] before the player has actually seen it'.<sup>124</sup> In *NieR: Automata*, most battles begin after the enemy has appeared on the screen. The only exception is when Emil's shop shows up in City Ruins.<sup>125</sup> According to the lead composer Okabe, the concept of composing *<12. Emil's shop>* is based on the director's request which intended to create Emil's cart as a "propaganda truck". Therefore, when the music was implemented in the game, composer Ueda added an effect on it which makes the music sound like it's playing from

<sup>123</sup> Huibert, *op. cit.*, p.61

<sup>124</sup> Jørgensen (2006), *op. cit.*, p.3

<sup>125</sup> Besides the main 5 endings (ABCDE), it is possible to fight with Emil Boss when the player reaches level 99. In that case, Emil and his cart appears on the screen for the player to attack.