Compressorhead: The Robot Band and Its Transmedia Storyworld

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Abstract. Robot-human relationships are being developed and redefined due to the emerging cultural phenomenon of popular robot bands such as Compressorhead and Z-Machine. Our primary research interest in this paper is the ways in which robots relate to, interact with, and are perceived by humans - or in short, human-robot relationships. To this aim we have conducted a small-scale (multi-'species') ethnography in which we were participant observers in the ongoing production of both the 'onstage' and 'offstage' transmedia storyworld of the all-robot band, Compressorhead. We use Henry Jenkins's (2004, 2006, 2008) concept of 'transmedia storytelling' as a way of understanding how a storyworld that includes extensive human-robot interaction is simultaneously created by both humans and robots across multiple communication media platforms. In so doing, we argue that robots can indeed be seen as musicians, performers, and even celebrities, and therefore can be taken seriously as producers of culture.

Keywords: Robot music · Transmedia storytelling · Robot bands · Compressorhead

1 Introduction

On January 3rd 2013 a robot band called Compressorhead uploaded a video to YouTube: a rehearsal of their cover of the song 'Ace of Spades' (1980) by British heavy metal band Motörhead, performed in the workshop of a group of machine artists in Germany. The video went 'viral' launching a story of an all-robot band dubbed 'more metal' than any before it. At the time of writing, that video had accumulated nearly 7 million views, over 70,000 'likes', 16,000 YouTube channel subscribers, and had generated over 7,000 comments [1]. As other robot stories have done in a range of media forms over time, such as Karel Čapek's play *R.U.R.* (1920), the manga *Astro Boy* (1952) by Osamu Tezuka, the novel *The Iron Man* (1968) by Ted Hughes, or Fritz Lang's '*Maschinenmensch'* (or, "machine-human") in the film *Metropolis* (1927) to name a few, Compressorhead is challenging how humans think about machines.

This paper aims to understand the role of robots as cultural participants - and also producers - in the world of heavy metal music. Specifically, we consider Compressorhead as a cultural robotic entity, developing and participating in both material culture,

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or the music and merchandising - and also in nonmaterial culture, or social values and norms. We use Jenkins's (2004) concept of 'transmedia storytelling' [2] as a way of understanding how a storyworld, such as one that explains human-robot interaction, is simultaneously created across multiple communication media platforms. In doing so, we argue that robots can indeed be musicians, performers, and even celebrities, and therefore need to be taken seriously as producers of culture. This mode of human-robot interaction is dispersed, heterogeneous, and is also generative in the sense that robots can also be understood to be 'evolving' cultures [3] in ongoing stories about their own futures.

Building on arguments made by a range of scholars interested in redefining culture in ways that better include non-humans (Latour 1999; Haraway 2008; Tsing 2012) [4–6], the broader implications of our position lie in the way stories about robots, told by humans - or even by robots themselves - can shift the relationships humans have to technology. By both simulating and countering quintessentially 'human' modes of performance, the robot band Compressorhead challenges two key conventions of thinking about robots that exist in public discourse: firstly the idea that robots are here to serve humans, and secondly the idea that cultural production is limited to humans. A broader, more nuanced telling of the way technological assemblages produce storyworlds in a transmedia way, as is demonstrated by Compressorhead's rise to fame, can help show that these ways of thinking belong to a human-centered past.

By exploring the storyworld of Compressorhead as it is generated across media platforms by a network of managers, venues, roadies, journalists, photographers, and groupies, as well as software, hardware, venues, and even seasons and musical fashions, we argue for an approach to cultural robotics that includes human and non-human actors in a transmedia sense. We explain how the (very human) formula (and tropes) of 'a rock band' enables a convincing image of autonomous robotic musicians, as their human developers fade (or even deliberately disappear) into the background. This explanation takes into consideration how the familiar narrative of the metal band is purposively exploited in order to suspend the disbelief of the audience and fans, until such suspension is no longer necessary, and the robots have also ostensibly become a 'band' in the human sense.

Throughout this paper we refer to Compressorhead as an 'all-robot band', as distinct from hybrid human-robot bands[1]. By this, we do not mean to imply that Compressorhead is fully autonomous; in its current iteration, the band relies heavily on its so-called 'meatbag' (i.e., human) creators. However, in its performance, and also therefore in its storytelling, it appears that the band is no more reliant on humans than is a regular human band reliant on other supportive humans to make gigs or recordings 'happen'. Compressorhead's autonomy is an important fiction, a narrative carefully and purposively created and maintained around the band. In our study of Compressorhead, we note that while the band itself is not fictional, various fictions related to the autonomy of the band-member robots are supported by a broader transmedia narrative. This narrative is generated, or is 'written', by an assemblage, composed of both humans and also non-humans.

[1] One example of such a human-robot (hybrid) band is: *Captured! By Robots* (1997-present). See: http://www.capturedbyrobots.com/.

Our primary research interest is focused on the ways in which robots themselves relate to, interact with, and are perceived by humans in, the world – or, human-robot relationships [7]. To this aim we have conducted a small-scale ethnography in which we were participant observers in the ongoing production of both the 'online' and 'offline' storyworld of Compressorhead. Whether this kind of ethnography is even possible is one of the questions raised by this paper, and has intersections with the emerging fields of cultural robotics, and multi-species ethnography [8]. One of the authors attended the 2013 *Big Day Out* music event in Sydney, Australia, as a backstage guest of the band Compressorhead. There, moving between the front-of-stage crowd and backstage, he observed the performance of the band and the behavior of the audience and crew. He also photographed and interviewed robot band members and their human 'minders'. Following this event, we also analyzed the official website of the band [9], their FaceBook site [10], and a range of YouTube and other online media channels, including user comments and editorial reviews of the band. In this paper we discuss in detail two published interviews with the band members, purposively selected for the way in which the journalists in each case maintained the fiction of the all-robot band.

This paper is structured in three parts. Firstly we provide a brief background to the production of popular music by robots, and an introduction to our use of the concept of transmedia storytelling. We then outline the 'origin story' of the band Compressorhead. We then move to a discussion of the 'narrative additives' we have identified which contribute to the storyworld of the 'all-robot band' fiction; these are divided into 'onstage' and 'offstage' elements. Finally we explore some of the possible future implications of Compressorhead and bands like it, for human-robot relationships.

2 Background

2.1 Context of Robot Music

Robot bands, for the purpose of this paper, can be defined as assemblages of anthropomorphic robots that perform to live audiences, and whose principal members play the instruments that typically form the foundation of contemporary bands such a guitars, bass, and drums. Since this definition is based on performance, it is important to acknowledge the rich history of robot music, of which robot bands are a subset.

Prior to the advent of recording technology such as Edison's 1877 phonograph, musical automatons were the only means to accurately and conveniently reproduce a musical performance [11]. Since these early mechanical sound machines, artists, scientists and engineers have continued development resulting in an expansive range of implementations.

Ajay Kapor defines a contemporary robotic musical instrument as "a sound-making device that automatically creates music with the use of mechanical parts, such as motors, solenoids and gears" [12]. These come in a multitude of physical manifestations ranging from abstracted machines such as Matt Heckert's 'Rotolyn' from the Mechanical Sound Orchestra (1988) [13] to Chico MacMurtrie's anthropomorphized 'Robot String Body' from *The Robotic Opera* (1992) [14]. The configuration of these musical robots ranges

from individual performers such as the piano-playing WABOT-2 (1980) [15] to robot orchestras or ensembles such as *The Man and Machine Robot Orchestra* at Logos [16].

Whilst a significant number of music machines have been developed in the preceding decades, either as solo instruments or ensembles, few artists and engineers have built anthropomorphic robot bands that emulate characteristics of their human counterparts. Notable examples include the The Trons, built from discarded electronics and suburban scrap in New Zealand (2000-present) [17], the slick Japanese robot band Z-Machines (2013- present) [18], and Compressorhead (2013-Present).

2.2 A Transmedia Storyworld

It is clear that music has been an important site of experimentation for exploring whether, as (Samani *et al*, 2013) note, culture can be "not only attributed to humans, but also encompasses the cultural exchanges between robots, robots and humans, as well as other intellectual and emotional identities" [19]. As media technologies such as the internet have been broadening definitions of culture over the last two decades, the possibilities of understanding robots as operating beyond single sites of production are also becoming apparent. The concept of 'transmedia storytelling' is useful in the emerging field of cultural robotics as it provides a way of understanding how a storyworld, such as one that includes human-robot interaction, is more often than not created across multiple platforms simultaneously. According to media scholar Henry Jenkins (2008), transmedia storytelling is a process where integral elements of a fiction are dispersed systematically across multiple delivery channels for the purpose of creating a unified and coordinated entertainment experience [20]. We apply this idea to the case of Compressorhead by considering the fiction that the band is 'all robot', operating, performing and touring in a world where robots enlist the help of humans, rather than the other way around. This fiction is arguably a part of the band's appeal and popularity, and is generated and circulated through both onstage performance, and offstage mediation.

The fiction is most clear in the representation of the relationship between the robots and their human counterparts, as the band's guitar player 'Fingers' states, talking about the band's collaboration with well known musician John Wright "… We enlisted the help of John, to write new material and to facilitate our quest for rock" [21]. Additional enlisted help takes both human and non-human forms: roadies, software, technologies of distribution, designers, technicians, brands, other robots such as moving head lighting fixtures, mobile devices, and other machines.

In our review of literature relating to the transmedia framing of storyworlds we have noted that, while many of the 'stories' used as examples of transmedia depict robots - *The Matrix* cycle of movies/games/media being the most frequently cited example - the participants in the production of such storyworlds in culture are generally limited to humans. It is one goal of this essay to test this limitation. In extending transmedia storytelling to robot and human interactions, we consider Compressorhead's (human) fans, and also the many collaborators (both human and non-human) in its storyworld production.

In defining 'transmedia', Jenkins (2006) looks at the ways cultural elements create a story 'world' or 'universe' in which more varieties of narrative, and also audience interaction and engagement, are possible:

> Transmedia storytelling is the art of world making. To fully experience any fictional world, consumers must assume the role of hunters and gatherers, chasing down bits of the story across media channels, comparing notes with each other via online discussion groups, and collaborating to ensure that everyone who invests time and effort will come away with a richer entertainment experience [22].

While acknowledging that transmedia has probably always existed, Jenkins points to the way convergent digital media spaces are providing new kinds of opportunities for storyworlds. Transmedia researcher and creator Christy Dena furthers this idea in her 'transhistorical perspective' arguing that the genealogy of transmedia storytelling is complex, and should include narrative theory and multimodal discourse analysis, amongst other branches [23]. However these various elements are understood to have emerged, it is the convergent digital media spaces, in combination with live performance that are arguably at the core of Compressorhead's appeal. It is within the transmedia storyworld created by these narrative 'additives' that hidden 'clues' can be found, character histories revealed, and possible meanings and futures imagined [24]."

We do not intend to propose that transmedia is the only or definitive way to think about the multiple practices, sites of production and audiences that contribute to the Compressorhead project, or indeed any robot band for that matter. Rather our intention is to use transmedia as a lens to understand the creation of culture that crosses human-machine lines. As Dena argues "the nature and breadth of transmedia practice has been obscured because investigations have been specific to certain industries, artistic sectors and forms [25]. Robot bands have not as yet been part of those investigations, and so by including them, we hope to expand the notion of transmedia.

While there are many (and sometimes, conflicting) takes on transmedia, in this paper the focus is on the creation of storyworlds through narrative additives, in order to ask: How might transmedia explain the relationship between humans and robots in the production of an all-robot band?

3 Compressorhead

In this section we apply the idea of a transmedia storyworld to the fiction of an autonomous robot band, by outlining the ways that Compressorhead is created, across media and performance modes. We look firstly at the story of the band's origins, then at onstage performances, and lastly the band's online presence.

These sections are not intended to make a clear distinction between onstage and offstage performance by referring to the former as 'live' and the latter as not. Rather we draw attention to the ways that technological mediations work at both 'sites' (online and offline) to create the fiction of Compressorhead's autonomy from humans. The proposition that 'live' music is not clearly defined has been explored by Cultural Studies theorists elsewhere; Holt (2010) for instance points to the way that the *idea* of live music has always been a product of broad social and cultural transformation, "born in the nexus

of commerce, media and entertainment" [26]. Live music, Holt argues, has only emerged as a category alongside the technologies of mass media broadcasting and recording. He points out that while 'live' came to generically refer to performance not reproduced in a studio, it also is used for technologically mediated performances: 'live show', 'live recording', 'live interaction' etc. "The live performance is associated with co-presence in the here and now, and the strict meaning involves a face-to-face relation in the same physical space [26]." He goes on to point out how distinctions in everyday language between a live recording and a studio recording or between a performance and a video have become complex as they refer to "different modes of production and perception with different economies and organisational contexts" [26]. The significance of this discussion to the notion of robot bands lies in the way that robots have been able to play 'live', as certain understandings of what the term 'playing live' means for a band have altered.

> When music exists as live music (that is to say, when it is associated with the discursive category of live music), the perspective is broadened from the music itself to questions about how, when and among whom the music is created, performed and heard in relation to practices of technological mediation. Only by examining live music in its communicative context can we understand its capacities in the production of authenticity, festivity and social presence [26].

Prior to Holt (2010), Frith (1996) argued that the value of live music is indeed about the narratives that people build around the music performance. The 'direct experiences' with music 'enable us to place ourselves in imaginative cultural narratives' [27]. In other words, concert narratives are stories about how people participate in culture, not just about music as an art form. Moving closer to the genre of music that includes the subject of this chapter, in his thesis on fan narratives within the punk music scene, Michael Janowski (2013) argues that "concert fan narratives are a vital post-contextual reproduction of music scene meaning, focused not on capital gain, but on social growth" [28]. Drawing on Frith, Janowski also notes that 'live concert is not simply a transitory experience, but also symbolizes what it means to be a music fan' [28].

3.1 Humble Beginnings

Compressorhead was purpose-built for performing 'live' robot music concerts. Formed through a creative collaboration between German, English and Australian artists from 2007 to 2012, the band consists of four anthropomorphic robot performers: 'Stickboy' on drums (assisted by a smaller robot, 'Stickboy Junior', on high-hat); 'Fingers' on guitar; and 'Bones' on bass. These machines were created by Frank Barnes (drum robots), Markus Kolb (guitar robot) and Miles van Dorssen (bass robot) [29].

The origin story of the band is mindfully told to and by fans, borrowing from classic 'rebellion' narratives of the metal and rock music genres. There are a number of attributes that correspond between the developmental trajectory of the robot band and similar (or, equivalent) human bands. For instance, one would be hard pressed to pick up a rock or metal band biography that did not commence with a story of humble 'working class' beginnings, rebelling against the establishment, defiance of authority (including breaking the law), and rehearsing in a garage. The Compressorhead origin story is similarly told by riffing on such tropes of classic rock music journalism. The robot band

members paint this picture in an interview for *Gibson* magazine, the brand of guitar played by Fingers:

> *Bones*: My dad worked in a sausage factory, filling meatbags for meatbags. He hated it and it put me off slaving for humans. Now, the meatbags slave for me, tending my every need while I rock.
> *Stickboy*: It's my mum that taught me to rebel. She was a multi-armed painting robot working at the shipyard and liked to malfunction. On many occasions, she would cover the sides of ships she was meant to be painting with digital graffiti, and it left the meatbags scratching their heads and trying to re-programme her. She really influenced my attitude.
> *Fingers*: I was put to work as a speed typist at a young age and couldn't stand it. I stole a guitar from my meatbag boss's son and haven't looked back [30].

The early development of Compressorhead also features in YouTube videos. In what appear to be workshops, lounge rooms, and garages, the band performs cover songs, just as human bands often do when starting out, and then go on to write their own original material. While each band member has its own fictional backstory, Compressorhead's origin story in some ways exaggerates the early 'togetherness' of the band, as the three robots were in reality, built one at a time over a number of years [31]. Notably, in official online press materials, there is no visual evidence of their existence presented before the band's inception.

One online video dated April 2011, well before the band started performing, shows Fingers earnestly practicing AC/DC's 'TNT' alone [32]. The official narrative is that Stickboy was initially a solo performer; Fingers and Stickboy soon teamed up; then recruited bassist Bones in 2012, and thus the band was formed:

> After one year of solo shows, I realized that I was in a league of my own,' Stickboy says. 'I spent many days and nights searching the darkest, dirtiest scrap yards to find the ultimate trash metal band members to join me on this musical endeavor [33].

While it is obviously humans who would have had to put the three (or, four) players in the same room together (and, turned them on), in the entertainment media we analysed, there was very little public reference to the robots' creators. This absence of designers, writers, artists and machinists in the storyworld is an important aspect of the Compressorhead fiction. We also confirmed with Miles Van Dorssen that this is indeed deliberate, and an agreement between the band's creators [34].

Van Dorssen is a highly skilled creative engineer and artist who has had a long history developing performative machines, both individually and with collectives such as Triclops International [35]. Despite the creative expertise behind Compressorhead, the audience - and, the band's fan base - rarely if ever hear about Van Dorssen, nor the rest of the developers. The way the band is portrayed in the public sphere is both deliberately considered and carefully managed to ensure that the discourse focuses on the band members as a cultural entity unto themselves, and not merely as 'mechanical puppets' programmed by their human operators. Positioning the robot band members in this precise and consistent way establishes a coherent 'robot-led storyworld', and each official media artifact reinforces this characterization. In the words of Stickboy: "Really, though, we are all the same inside, right? Robot or human, all of us want the same things, really. Things like tune-ups, regular servicing and *Heino* instant-cake mix [21]."

3.2 Narrative Additives: Onstage

In 2013 Ken West, the director of the *Big Day Out* music festival booked Compressorhead to play on the main stage. During their first performance in Sydney, before embarking on the national festival tour, the band ascended from their 'backstage' location (using a robotic stage-riser) to perform to a capacity crowd of 57,000 people (Fig. 1).

Fig. 1. Compressorhead play the *Big Day Out* music festival, Sydney, Australia. (Image © Alex Davies 2013)

Performing at Australia's largest touring music festival, and alongside headlining acts such as The Red Hot Chili Peppers, and also The Killers, and Grinspoon contributed to the band's perceived 'authenticity' [36]. In promotional material created for the festival there was no distinction made between humans and robots; Compressorhead was billed alongside celebrities from the upper echelons of industry success rather than as a fringe robot sideshow.

During live performances, audiences applaud the band as if they are sentient humans, and as demonstrated at the 2013 *Big Day Out* Gold Coast (Australia), audiences also sing along to the songs being performed [37]. Just as some have a propensity to applaud at the end of a film in a darkened cinema, claps and whoops directed at the robot band suggest what Lombard and Ditton (1997) define as "presence as social actor within medium" [38], whereby the audience, despite being aware that the characters are not real, suppress this awareness and engage with the medium (in this case, robots) as if they were, despite it being illogical to do so. This human behavioral response to robots has also been demonstrated by Katevas et al. (2014) in the performative context of robot stand-up comedy, whereby audience members also demonstrated "laughter, applauding and enjoyment" during a humanoid robot's routine [39]. In the case of Compressorhead, fans at live performances contribute to and participate in the fiction of 'the all-robot band' by engaging with the performance in much the same way as they would for human musicians. For the spectator, the robot band members' actions conform to expectations of a human on stage; Stickboy's head logically follows the movement of his four (!)

arms as he strikes the different instruments of his drum kit, and both Fingers and Bones expressively 'rock out' with a range of bodily movements timed to the tempo or 'groove' of the current song being played. From an audience's perspective, it appears that the band is genuinely absorbed in and even enjoying the music they are performing. As research on 'a social head for a robotic musician' by Hoffman and Ju (2014) suggests, such gestures when performed by a robot band have the capacity to "communicate, engage, and offer dynamic possibilities beyond the machines' surface appearance or pragmatic motion paths" [40].

Another aspect of the onstage performance essential to the Compressorhead fiction is the appearance of error and spontaneity, which the band explains in the following way:

> [**Noisey:**] *Some might say that because you are robots, and are therefore robotic, you can't put as much passion or groove into your music as, say, Lars Ulrich does. Discuss.*
> **Bones:** You meat bags talk about passion a lot. We think passion is a polite expression for inept sloppiness, a kind of improvised error status. We sometimes error also, but it is real, and the results can be extremely expressive. Lars Ulrich can't play drums like Stickboy.
> **Stickboy:** Yes, keeping it real apparently means making lots of mistakes. We were frankly confused at first. When John asked me why I wasn't speeding up, I didn't understand. He seemed agitated and went straight to the beer fridge. Often he went straight to the beer fridge, come to think of it. We have drawn some conclusions and have adopted a well-oiled approach to our new material. Full steam ahead, as you meatbags might quip… [21]

As of this writing, Compressorhead's developers are in the process of building two additional robotic band members, a vocalist and additional guitar player [41]. Beyond the physical presence of the performers onstage, concepts also exist for additional characters that extend and reinforce the established storyworld of the band. Ideas for a robotic band manager, robotic roadies and stage-diving inflatable robots are also under discussion. Whilst not actively contributing to the musical output of the band, developments such as these would add further depth and layers to the transmedia narrative onstage, and may also provide audiences with more entry points into the fictional world. As Ian Condry (2015) notes, it is not so much the stories that are transportable across platforms, but it is the robot characters themselves that are enduring [42].

3.3 Narrative Additives: Offstage

The narrative of the all-robot metal band is told in a range of ways offstage that are arguably as important as the band's formidable onstage presence. This is indeed the case generally in the production of band culture, and Berg *et al*. (2015) have argued that it is particularly the case in heavy metal culture, where material culture (such as band shirts) play such an important role for fans in "the fusion of music, identity, and ideology" [43].

In certain highly 'participatory' channels and sites of media production, such as on YouTube, Reddit, Instagram and Twitter, it is the band's online fans that generate many narrative additives. We have analysed these sites and noticed a number of trends. Firstly, in all the comments from social media we looked at, the creators of the robots are never mentioned. In fact there is little reference to humans, or indeed, the distinction between robots and humans. This fiction, generated and maintained by fans, partly builds the Compressorhead transmedia fiction. Secondly, there is little reference to the technical

aspects of the band, their machine parts, or their reliance on humans - rather, the focus of comments is typical of fans appreciating a band, and the specific music they play. Comments such as "You guys need to come to the UK please I want to meet you Stickboy" and "I want to have your babies!" are made online as if they are addressed directly to the band members [1][2]. Despite fans being aware that the band members themselves are unable to respond (and unable to procreate with humans), fans frequently use the second-person address to maintain the illusion, and participate in building the transmedia narrative. Comments that actually refer to the band members as robots are far more rare:

> "Unfortunately, like a typical drummer, he is still playing too loud for the room. The other robots kind of just accept it and try to get through the song [44]."
> "They're young. They're innocent. They're REAL Heavy Metal. And you can switch them off [44]."

While it is difficult to determine in every single case, we believe that narrative additives such as these created by fans are supported by the official Compressorhead website. The official website is the most carefully curated site of cultural production of the Compressorhead transmedia story. The site employs the traditional aesthetics of metal culture, and authenticates the storyworld as the first 'point of contact' for new fans. The site is designed as a typical band site, including candid celebrity moments, photos of individual band members during performances, and sections for 'on tour', 'bios', gig information, and press releases [9] (Fig. 2).

Fig. 2. Bones at the Hyatt NY. (© 2015 *Compressorhead* website, used with permission. Original image at: https://compressorhead.rocks/Thumbs.html, used here with permission)

[2] See also additional Comments at: `Compressorhead Ace of Spades', YouTube.com, 2013, https://www.youtube.com/watch?v=3RBSkq-_St8.

Perhaps as would be expected, it is beyond the official website, and in the broader internet presence of Compressorhead that we find the most powerful narrative additives, produced by human fans and even by other robots. The anonymity of some of the online content generated about the band also contributes to the idea of the 'all-robot' band, and more generally to the idea that robots could (recursively) make other robots, and contribute to (or generate) culture, including even robotic (online) fans of robot bands. A Google search (in 2015) for "compressorhead band" yields around 3,200 results, or a significant volume of online information, and discourse. How much of the online discourse is of 'human' versus 'robot' origins is also open to further investigation. Given the recent development in software-generated content in the realm of digital journalism [45], it is not a great stretch to imagine that some of this content is generated by other online robots. Software also aggregates and organizes the Google search results, for us (humans) to comprehend. As Pavlik (2013) notes: "Intelligent agents - software robots that act autonomously on behalf of another entity (typically human, but sometimes another software robot) - are also becoming increasingly common on the Web… [46]."

Compressorhead band members employ a characteristic interview style when engaging with journalists. Routinely referring to humans as 'meatbags' they consistently maintain their autonomy. The band also became further subsumed into the entertainment industry when they appeared in front of a live studio audience on the German TV program 'Die Bülent Ceylan Show', with cinematic camera conventions including crane shots and dollies enhancing the 'authenticity' of the group as rock stars, whilst the audience clapped along to AC/DC's 'TNT' played by Fingers and Stickboy [47].

From November to December 2015, the band also ran a *Kickstarter* crowdfunding campaign to fund the creation of a robot singer, and to record their debut album. Canadian songwriter and musician John Wright, of the bands NoMeansNo and The Hanson Brothers has formed a collaboration with the band to create original song material [48]. However, although the target figure of €290,000 was not reached by the funding campaign deadline, arguably the publicity around the crowdfunding campaign also extended the band's transmedia narrative, potentially increased the fan base, and increased public awareness of the band, as the campaign was also reported on various other online sites [49].

3.4 Beyond the Cover Band

Over the last decade there have been a number of advancements in the development of AI-imbued musical machines that can dynamically respond in a musical manner. For example, Festo's Sound Machines 2.0, an autonomous compositional machine comprised of five stringed instruments that respond to an input melody, and each other, to create novel musical compositions [50]. Weinburg and Driscoll (2006) describe a robotic percussionist named Haile that can "can listen to live players, analyze perceptual musical aspects in real-time, and use the product of this analysis to play along in a collaborative manner" [51], and Hoffman and Weinberg (2010) describe Shimon, a marimba playing robot with the ability to improvise in real time with a human counterpart [52]. Compressorhead also demonstrates that the sophisticated mechanics needed for robot bands to create original music content already exist. If a human musical programmer were supplanted by an AI (artificially-intelligent) counterpart, it is plausible

that the next evolutionary stage of robot bands could generate truly original content by jamming with each other. Our argument here that robots can create culture will be further supported when this is the case. In the future, it now appears likely that robot bands will not only create original and valued (or, 'creative') cultural artifacts [53], but would also alter cultural perceptions of robots, due to their creative output being integrated into the transmedia fabric of the current entertainment industry.

It could also be argued that the incorporation of Compressorhead's music into remixed popular song material is more important in demonstrating that the robots are genuine cultural producers, rather than via their generation of original musical content, however that is the topic of another paper. Suffice to say that examples of remixes already exist where Compressorhead performances and recordings are treated as are any other piece of content produced by humans (or machines), losing their 'robotness' in the remix with human-produced work. One vivid example is the 2013 remix 'Hindi Rock - Punkh featuring Compressorhead (The Robot Band)' by the Indian punk band Punkh [54].

4 Conclusion

By exploring the storyworld of Compressorhead as it is generated – by both humans and robots - across media platforms and channels, we have argued for a transmedia approach to examining cultural robotics. While there is currently (and may always be) a focus on the question of whether robots can generate 'original' creative cultural artifacts, we hope that our essay has raised other and deeper questions. As robot bands continue to collaborate with humans in future, will humans continue to expand their willingness to collaborate in new ways? One way is through direct creative collaboration, as between John Wright and Compressorhead, and Squarepusher (aka Tom Jenkinson) with Z-Machine, while other modes of collaboration are more subtle. We have pointed to some of these by thinking about the ways transmedia 'narrative additives' contribute to the storyworld of the 'all-robot' band, including journalists interviewing robot band members; editors giving them media space; promoters billing the band alongside human headliners; fans rocking out to their 'live' sets; and of course, academics giving them attention as serious cultural producers. If humans are viewed as both the 'tool-making animal' and also, as 'the storytelling animal' [55], then, as Compressorhead's bass player Bones endearingly points out, robot-human relationships may become ever-increasingly fundamental, as our mutual culture evolves:

> [**Leonard:**] *Which other touring bands do you like hanging out with?*
> **Bones:** They're all meatbags and don't understand our humor. We do appreciate their abilities to rock and this is our common language, I guess [30].

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