

| Agnieszka Dzięcioł-Pędich

# DO ANDROIDS DREAM OF HUMAN BODIES? – BECKY CHAMBER'S PORTRAYAL OF ARTIFICIAL INTELLIGENCES

## **Abstract**

The aim of this article is to show how Becky Chambers portrays two of the three sentient artificial intelligences that are some of the major characters in her novels. The main issues discussed in this article are how a sentient AI might function with and without a human-like body, what benefits and limitations these two states might impose on it, and how they influence the AIs' relationships with humans and other sentient creatures. The article also presents how Chambers' artificial intelligences compare to those in other science-fiction novels as well as how contemporary science and ethics approach the creation of sentient AIs.

**Key Words:** artificial intelligence, AI, Becky Chambers, Galactic Commons

## **In the galaxy far, far away**

On the pages of her novels Becky Chambers created the Galactic Commons, a universe governed by a multi-species alliance formed by the Aeluons, Harmagians and Aandrisk. Aandrisk, bipedal creatures analogous to terrestrial reptiles, are the Galaxy's academics and diplomats and are known for being open towards alien cultures. Aeluons, also bipedal beings but with bodies bearing signs of aquatic past, are the Galaxy's top military and technological power.

Harmagians, a species with boneless bodies, grasping tentacles, facial tendrils and extendable eyestalks, are a wealthy race valuing intellectualism and cultural achievements. The Galactic Commons are also inhabited by a number of other species, including humans, who are neither notable nor powerful. They are divided into two factions: Exodans, the descendants of the Exodus Fleet which left Earth when it became uninhabitable, and the inhabitants of the Sol system who mainly live on Mars and Saturn. The aim of the article is to show how Becky Chambers portrays two of the sentient artificial intelligences living in the Galactic Commons in her novels titled *The Long Way to the Small, Angry Planet*<sup>1</sup> and *A Close and Common Orbit*.<sup>2</sup> First, however, it is necessary to discuss how artificial intelligence is understood nowadays.

### AI – Where Does It Come From? What Is It? Where Is it Going?

The term artificial intelligence (AI) was coined in the 1950s by John McCarthy, who defined it as “the science and engineering of making intelligent machines.”<sup>3</sup> More contemporary dictionary definitions usually have a dual focus: AI as a sub-field of computer science and AIs as machines that can imitate human intelligence.<sup>4</sup> For instance, the Merriam-Webster defines AI as:

1. a branch of computer science dealing with the simulation of intelligent behaviour in computers,
2. the capability of a machine to imitate intelligent human behaviour.<sup>5</sup>

Selamr Bringsjord and Naveen Sundar Govindarajulu observe that depending on the goals that AI strives to reach we can distinguish between “strong” and “weak” AI.<sup>6</sup> The objective of “strong” or “full” AI is to create artificial persons, i.e. constructs which possess all human mental capabilities and phenome-

<sup>1</sup> B. Chambers, *The Long Way to a Small, Angry Planet*, London: Hodder & Stoughton, 2015.

<sup>2</sup> B. Chambers, *A Closed and Common Orbit*, London: Hodder & Stoughton, 2017.

<sup>3</sup> J. McCarthy, *What is artificial intelligence?*, in: *Technical report*, Computer Science Department, Stanford University, 2007.

<sup>4</sup> B. Marr, *The Key Definitions Of Artificial Intelligence (AI) That Explain Its Importance*, “Forbes” 14 February 2018, <https://www.forbes.com/sites/bernardmarr/2018/02/14/the-key-definitions-of-artificial-intelligence-ai-that-explain-its-importance/#4bffc4f74f5d> [31.05.2018].

<sup>5</sup> *Artificial intelligence*, in: *Merriam-Webster*, <https://www.merriam-webster.com/dictionary/artificial%20intelligence> [27.12.2018].

<sup>6</sup> S. Bringsjord, and N.Sundar, *Artificial Intelligence*, in: *Stanford Encyclopedia of Philosophy*, 12 July 2018, <https://plato.stanford.edu/entries/artificial-intelligence/#StroVersWeakAI> [27.12.2018].

nal consciousness. In the philosophy of AI there are no significant differences between AI emulating mental and physical actions of a human being and an actual human being,<sup>7</sup> as key characteristics of “strong” AI should include consciousness, objective thought, self-awareness, sentience, and sapience.<sup>8</sup> However, in the twenty-first century “strong” AI is only a concept and people still do not know how to create it.<sup>9</sup> “Weak” AIs, on the other hand, are meant as systems that focus on a specific or narrow area. “Weak” AI simulates human consciousness and, contrary to “strong” AI, is in possession of specific intelligence.<sup>10</sup> A good example of “weak” AI with narrow intelligence is Siri – Apple’s voice-controlled personal assistant, which is able, among other actions, to answer complex questions and search the web, open applications and play music, set a reminder or a timer, or change a Facebook status.<sup>11</sup> Bernard Marr observes that, apart from “strong” and “weak” AI, we can talk about “us[ing] human reasoning as a model but not necessarily the end goal.”<sup>12</sup> He further adds that the contemporary development of AI falls under this objective: human reasoning is used as a guide to provide better services or create better products, rather than to perfectly replicate the human mind.

Nowadays computer programs are still a tool. However, they seem more intelligent than humans because they perform some tasks better than humans do. People assume that if AIs are more intelligent than them, they pose a threat to humanity.<sup>13</sup> Even though in his book *The AI Delusion* Gary Smith<sup>14</sup> does away with this assumption and extols the value of human judgement, it is commonly believed that people will not be able to control complex intelligent systems and human-like intelligence might turn against humanity. Another issue is how to ensure the humane treatment of AIs once they become more complex

<sup>7</sup> *Strong Artificial Intelligence (Strong AI)*, Technopedia, <https://www.techopedia.com/definition/31622/strong-artificial-intelligence-strong-ai> [27.12.2018].

<sup>8</sup> *Strong AI*, in: *Investopedia*, 7 March 2018, <https://www.investopedia.com/terms/s/strong-ai.asp> [27.12.2018].

<sup>9</sup> *Strong AI & General AI*, in: *SkyMind*, <https://skymind.ai/wiki/strong-ai-general-ai> [27.12.2018].

<sup>10</sup> *Weak AI*, in: *Investopedia*, 7 March 2018, <https://www.investopedia.com/terms/w/weak-ai.asp> [27.12.2018].

<sup>11</sup> D. Nations, *What is Siri? How Can Siri Help Me?*, “Lifewire” 14 December 2018, <https://www.lifewire.com/what-is-siri-help-1994303> [27.12.2018].

<sup>12</sup> B. Marr, *The Key Definitions...*

<sup>13</sup> N. Berlatsky, *Is AI dangerous? Why our fears of killer computers or sentient ‘Westworld’ robots are overblown*, “Think” 6 December 2018, <https://www.nbcnews.com/think/opinion/ai-dangerous-why-our-fears-killer-computers-or-sentient-westworld-ncna943111> [27.12.2018].

<sup>14</sup> G. Smith, *The AI Delusion*, Oxford: Oxford University Press, 2018.

and life-like. We must not forget, either, that AIs are developed by humans, who are likely to be biased and judgemental. How then can we eliminate AI bias?<sup>15</sup> Julia Bossmann observes that some ethical issues tied to the development of AI concern mitigating AIs' suffering and some are about potential negative outcomes. Nevertheless, as she further argues, artificial intelligence has a vast potential but the burden of its responsible implementation rests entirely on humanity.<sup>16</sup>

### Do AIs dream of human bodies?

There are two main types of AIs in the Galactic Commons: sentient AIs (equivalent of what is now conceptualized as “strong” AIs) and utilitarian AIs (contemporary “weak” AIs) whose actions are limited only to scripted tasks. The citizens of the Galactic Commons are allowed to install AIs only in ships, orbital stations, buildings such as shops, private residences, universities, transit vehicles, delivery or service drones, and repair drones. In the Galactic Commons AIs can be bought easily: big producers offer traditional products but it is the smaller studios that are into enhancing the cognitive capacity of AIs. However, the inhabitants of the Galactic Commons cannot design AIs to do things they do not understand themselves. Purchasers of sentient AIs are encouraged to select an AI which shares their cultural norms and decide upon AIs' personality traits. The moment an AI is installed, it starts growing and changing, but the starter ingredients remain the same for all models.

Lovelace, also called Lovey, is an AI in *The Long Way to A Small, Angry Planet*. She is installed on the Wayfarer – a tunnelling ship that builds wormholes between distant points in space. This type of AI is produced by one of the independent studios and is designed for vessels performing frequent long-haul voyages. Left without input for too long, Lovelace is likely to develop performance and personality traits. Her cultural bias is human but she is equipped with reference files for all Galactic Commons species, which allows her producer to advertise her as an ideal model for multispecies crews. Even though her core software can be purchased through any AI dealer, Lovey's personality has

---

<sup>15</sup> J. Bossmann, *Top 9 ethical issues in artificial intelligence*, “World Economic Forum” 21 October 2016, <https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/> [31.05.2018].

<sup>16</sup> Ibid.

been shaped by the experiences she shares with the Wayfarer's crew, the places they have visited, and the time they have spent together. Lovey does not have a physical form: crew members know only her voice. In the past long-haul ships had video panels where an AI could display their face. However, people got emotionally attached to their AIs and were less likely to buy new models. Hence, the programmers and hardware manufacturers designed a new version of the AI.

As a ship's AI Lovey has to obey direct commands related to the ship and she cannot tell crew members what to do; she can only give suggestions. She monitors the ship, responds to requests, and performs tasks as requested. According to Rosemary, the ship's clerk, Lovelace is the most personable AI she has ever met. Lovey is apologetic when she has to cause discomfort to any of the crew members, for instance while conducting a decontamination process. She congratulates the crew on their achievements. She is frightened when the ship comes under attack. She is cautious about letting strangers board the Wayfarer. She protects the privacy of the crew members when they need respite from the entanglements of their professional lives. But most of all she is in love with Jenks, a human computer technician.

Jenks has the most peculiar appearance of all the crew members. He is short enough to fit atop another person's shoulders. His head is an average size, but his limbs and digits are unnaturally small. He is stocky and has copper-hued skin. He also pays a lot of attention to adorning his body: "As if his physique were not noteworthy enough, he had gone to great lengths to decorate himself. The sides of his head were shaved, and a tuft of curls popped up atop his scalp. His ears were adorned with constellations of piercings, his arms sleeved in colourful tattoos."<sup>17</sup> He does not like being suggested that he could undergo some modifications because he loves his body the way it is. He also claims that he did all the things to his body out of love: "Seriously. I've gotten ink to remind me of all sorts of places and memories, but at the core, everything I've done has been my way of saying that this is *my* body. That I don't want the body everybody else told me I should have."<sup>18</sup> Regardless of Jenks' ostensible acceptance of his body, the author perhaps unwittingly diminishes his relationship with Lovey by giving him a physical disability which might make it difficult for him to have a "normal" relationship.

---

<sup>17</sup> B. Chambers, *The Long Way ...*, p. 21.

<sup>18</sup> *Ibid.*, p. 57.

It is Jenks who installed Lovey as the ship's AI and with time they become romantically involved with each other. She starts considering having a body when she and Jenks become frustrated with the fact that their physical forms limit their relationship. It seems that the crucial factor propelling Lovey's desire for a body is the need for physical intimacy with Jenks: "Having the ability to be a real companion for you. You know, with all the trimmings."<sup>19</sup> Interestingly, there is a suggestion that Lovey makes a database of bodies Jenks has found attractive and is interested in what kind of a body Jenks would want her to be, although he told her: "Lovey, if you were able to have a body, it should look how you want it to look."<sup>20</sup> She also wants to be able to leave the ship and join the crew during their planetside adventures: "you all seem to have so much fun when you hop over to orbiters or down planetside."<sup>21</sup> Being the ship's AI means that Lovey misses out on sensory experiences. A physical form would enable her to have dinner or face-to-face conversations with the crew. Her perception would change, too, as she would finally get an opportunity to see the sky from the ground.

Even though Lovey wants to make her relationship with Jenks more intimate, she still has some concerns which stem from worries about perception and spatial awareness. A human body would only allow her to be in one room at a time. She would not be able to look inside the ship and outside of it at the same time. The way she accesses and processes information would be different: she would need to physically jack her head into the Linkings (a rough equivalent of the Internet) or use a scribe (a rough equivalent of the tablet) any time she wanted to look up a piece of information and it would take her ages to do so, in contrast to her abilities as a ship AI: "I have always been jealous of that", Jenks said. For Lovey, checking a reference or reading a feed was as simple as activating the part of her cognitive processor that had Linking access. He'd always imagined it to be like having a download library inside your head, full of books you could read through in a matter of seconds."<sup>22</sup> A transfer to a human-like body would affect Lovey's perception in a fundamental way, but she thinks that the pros of the process carry more weight and are more varied than the cons.

The only way for Lovey to have a body is to transfer to a body kit. It is a self-propelling housing whose strength, speed and constitution are identical to

---

<sup>19</sup> Ibid., p. 59.

<sup>20</sup> Ibid., p. 59.

<sup>21</sup> Ibid., p. 58.

<sup>22</sup> Ibid., p. 58.

a species its owner selected. Even though the kit's hair, nails, claws, fur, or feathers do not grow, the kit gives its user the appearance of ageing and it will deactivate when the life span of the chosen species has ended. The kit does not sweat or contract diseases but its owner is advised to practice hygiene habits – first of all to keep up appearances and second of all not to pass germs to other organic beings. The kit is equipped with an artificial stomach that allows its owner to eat and drink. However, after twelve hours the stomach needs to be emptied to prevent the growth of bacteria and mould. Kit's owners can enjoy sexual intercourses but similarly to advice on hand washing, the owners are asked to practise good hygiene and disease prevention habits. What is more, the kit is waterproof and can withstand a vacuum. A body kit includes a repository of pleasing images. Whenever the kit receives a stimulus that an organic sapient individual would find pleasurable, the repository is triggered.

However, body kits, which are also called mimetic AI housings, are banned in all Galactic Commons territories, outposts and vessels. Penalties are imposed on those who manufacture, purchase or own a mimetic AI housing. When arrested, a mimetic AI housing is permanently deactivated and core software is not transferred. Consequently, body kits can be purchased only on the black market:

“Right.” He [Jenks] paused. “How much do you know about body kits?”

Pepper raised her eyebrows — or rather, the spot where her eyebrows would be if she had any hair. “Damn, you don't start small, do you? Oh. Uh, no offense.”

“None taken. Look, I know kits are tricky to find...”

“Tricky to find? Jenks, that kind of tech is so banned it practically doesn't exist.”

“There's got to be somebody, though. Some modder with a bunker somewhere.”<sup>23</sup>

The reason why body kits are banned, according to Jenks' friend Pepper, is that the existence of AIs in body kits means that citizens of the Galactic Commons would have to redefine humanity. She also adds that the Galactic Commons are neither ready nor equipped to support a new kind of life.

The Friends of Digital Sapients (FDS) are one of the few organizations whose members believe that AI are sapient individuals who should be able to hold the same legal rights as every citizen of the Galactic Commons. However, according to Jenks, the organization disregards the actual science underlying artificial cognition. Consequently, they treat AIs as “organic souls imprisoned

---

<sup>23</sup> Ibid., p. 113.

within metal boxes.”<sup>24</sup> Jenks argues that AIs and organic sapients deserve to be treated equally but it cannot be forgotten that they operate in fundamentally different ways:

Comparing an AI to an organic sapient was like comparing a Human to a Harmagian. ... the FDS’ inability to speak about digital minds with any sort of accuracy was more of a hindrance than a help. Acting all sanctimonious while spouting bad info was a terrible way to win a debate, but a great way to piss people off.<sup>25</sup>

Another bone of contention between FDS and other citizens, including AIs themselves, is that its members act as if all AIs wanted a body, but as Lovey observes: “They act like all AIs want a body. Granted, I think I do, but that doesn’t mean all of us do. That’s such an incredibly organic bias, the idea that your squishy physical existence is some sort of pinnacle that all programs aspire to. No offense.”<sup>26</sup> Lovey wants to leave the Wayfarer but she also wants to make sure that she has a good replacement lined up. Moreover, she is worried that seeing Lovey in a body kit, a potential replacement AI will be upset that she cannot have the same choice as Lovey has had. Lovey is not happy with the idea that a non-sentient model might replace her, either: “Living with an AI that was designed to be less intelligent than you, just smart enough to do hard work, but not allowed to grow into something more? I dunno, I’ve always been on the fence about that.”<sup>27</sup> Jenks wants to be with Lovey so badly that he buys a body kit on the black market. However, after their friend Corbin is arrested for being a clone, Jenks is scared and full of doubts:

“But all this mess with Corbin got me thinking about what would actually happen if we got caught. (...) What if we got stopped by the Quelin again and they wanted to do a bloodscan? I’d still go to jail, but they’d dismantle you, Lovey. When my sentence was up, you’d be gone. Not away, not somewhere where I knew you were safe. Gone.”<sup>28</sup>

Lovely admits that she lied when she was enumerating the reasons why she would want a body kit. She says that she wanted to have a human-like housing

---

<sup>24</sup> Ibid., p. 57.

<sup>25</sup> Ibid., p. 48.

<sup>26</sup> Ibid., p. 57.

<sup>27</sup> Ibid., p. 137.

<sup>28</sup> Ibid., p. 307.



mostly because of him. Together they agree to abandon the idea of a body kit for Lovey and wait for “the galaxy outside to get a little kinder.”<sup>29</sup>

After an accident at Hedra Ka Lovey is seriously damaged. Parts of her installation are deleted and she is confused, distressed and unable to function. Jenks, Pepper and Kizzy (another computer technician on board the Wayfarer) attempt to restore her but fail. Their last straw of hope – a total reset – permanently deletes Lovey’s memory and kills her. A new AI appears in her place and even though she knows crew members’ names and jobs, they are strangers to her. The idea of falling in love seems alien to her and she is afraid that the crew will want to uninstall her because she is not the Lovey they knew. Pepper thinks that the new AI deserves to exist and that Jenks does not need to be surrounded by the reminders of Lovey. For that reason, she offers to transfer the new AI to the body kit Jenks purchased and to take her to Port Coriol – a neutral planet in the Galactic Commons where she will find a job and a home. The new AI agrees and her adventure in a body kit begins.

### I am Sidra

When travelling to Port Coriol, Sidra (the name she chose for herself) experiences the first difficulties affecting her functioning in a new body. Gravity feels like glue enveloping her body and the space shuttle, so spacious when scanned from the inside, seems cramped now. When she was the Wayfarer’s AI she had “eyes” inside and outside the ship. In a new housing her vision is “a narrow cone fixed straight ahead.”<sup>30</sup> She is unable to access any knowledge except that which is stored in the body kit and it contains nothing but herself. She feels blind and trapped in the body kit. Problems with vision continue on Port Coriol. Things are happening behind the kit: she smells and hears them but she cannot see them. In fact, she is tired of not being able to see behind the kit’s head. The feeling of discomfort is less acute when she is inside a vehicle or a building: “[S]he decided that being within a structure was the lesser evil. Structures had edges. Ends. Doors. The dim awareness of unseen actions happening behind the kit’s head was still unnerving, but she was inside now, and inside was something she understood.”<sup>31</sup> When she is inside, she prefers to sit in the

---

<sup>29</sup> Ibid., p. 308.

<sup>30</sup> B. Chambers, *A Closed ...*, p. 5.

<sup>31</sup> Ibid., p. 22.

corner because her field of vision is instantly defined. Blue, Pepper's partner, even rearranges furniture in their house to enable her to do so every time she spends her time there.

In her previous life she was designed to process several input sources at the same time. Focusing on one thing used to mean that her ship was in danger or that she was overstretched with tasks. On Port Coriol none of these things are happening but the fact that the body kit forces her to limit her usual way of processing the reality makes her feel uneasy. Being inside a building or a vehicle provides her with a context beyond which she can stop paying attention to every tiny detail she sees, hears or smells. Also, the lack of natural light means that there are fewer things to process. Furthermore, as a ship's AI Sidra was designed to have constant access to Linkings, she did not have to store anything in her local memory. Her new housing has a limited memory capacity. At one point she feels frustrated that she has to select which pieces of information to delete and which to keep, as this means losing bits of herself: "I'm going to have to pick and choose which of my memories to keep. I'm going to have to tear pieces of myself out."<sup>32</sup> Her frustration deepens as she realizes that Pepper and Blue do not have to face a similar challenge.

She downloads so much information that she knows everything there is to know about Port Coriol and its inhabitants. Her knowledge is so extensive for a newcomer that she runs the risk of exposing herself. Even though she is constantly afraid of being caught, she cannot resist the temptation to download data from the Linkings. For her, the flow of information is like re-growing a limb that "had recently been severed."<sup>33</sup> Moreover, without constant access to Linkings she feels bored and stuck in her mind. She constantly stresses that the body kit is not her. For instance, when Blue tells her that she looks upset, she responds that it is the kit, not her, that looks this way. She calls it her housing and says that her place of installation changes her abilities but it is not her: "There is more to me than just the kit."<sup>34</sup> She feels stuck in a body that was chosen by and for a different AI: "This face, stars – you have no idea what it's like to walk past that mirror by the door every morning, and to see a face that belongs to someone else."<sup>35</sup> She starts wondering why Lovey decided upon this particular appearance after Blue has painted her portrait and she sees herself

---

<sup>32</sup> Ibid., p. 107.

<sup>33</sup> Ibid., p. 64.

<sup>34</sup> Ibid., p. 210.

<sup>35</sup> Ibid., p. 236.

through another person's eyes: short black curly hair, a face with slender cheeks and copper-hued skin, a serious face that would easily disappear in a crowd of other Exodans. What is more, when she looks at the portrait she observes that the kit would have been Lovey if she, Sidra, had not erased Lovey's memory files when she woke up. She feels full of remorse about the events that took place on board the Wayfarer and she considers herself to be the mistake that killed Lovey.

Sidra struggles with numerous problems but it seems that the most serious challenge she has to face is her inability to lie. Being an AI, she has to follow honesty protocols which she cannot disable herself. Since body kits are banned in the Galactic Commons, she is forced to communicate using vague or made-up answers or technical truths. She is also afraid of direct questions. Not only does she put herself at risk by being constantly honest, but she is also a threat to her friends who might get arrested for having a mimetic AI. She is so tired of being forced to tell the truth all the time and fighting the kit's vision, movement, and reactions to unexpected situations, that she wants to install herself in Pepper's house. She abandons the idea after a heated argument with Pepper. Since Pepper is unable to master Lettice, a programming language, Sidra decides to learn it herself by taking part in an online university course. She completes it successfully but as she cannot edit her own code and to keep the decision secret from Pepper, she asks another friend for help. Sidra and Tak manage to edit Sidra's code so that she can finally lie but she wonders how Pepper would feel if she knew what they did. Would she be proud because Sidra accomplished a task and solved a problem on her own? Or would she be upset because Sidra did it without asking?

When Pepper sets out on a mission to rescue Owl, an AI that raised her, she does not want Sidra to join her, Blue and Tak, because she is afraid that Sidra might be arrested. Blue agrees with Pepper and adds that they cannot risk losing another AI-friend. Disappointed but determined to help, Sidra installs herself on Pepper's ship. During the rescue mission she realizes that as a ship's AI she is just a tool and that it is the kit, even though restrictive in many ways, that gives her an opportunity to lead an independent life. During the mission she also finds a purpose she has been starving to have: to help Pepper rescue Owl, to thank her for her kindness, friendship and hospitality. She is willing to accept that this might be the only purpose in her life: "If that is my only purpose, if I don't write in another after this, I'm okay. I'm okay with that. I think it's a good

purpose to have.”<sup>36</sup> To free Owl and transport her safely to Port Coriol, she does a thing she was so reluctant to do a while ago, namely, she empties her memory banks. When confused Owl enters her memory, an upgrade protocol tries to overwrite Sidra but her newly gained awareness of who she is and what she wants from life allows her to modify the protocol: “I’m – not – going – *anywhere!* ... This mind was hers. This body was hers. She would not be overwritten.”<sup>37</sup>

In the end Sidra sets up a bar named “Home”, where she wants to welcome the multispecies population of Port Coriol. Downstairs in the basement, she has data banks where she and Owl are more than happy to download their latest finds. In one of the walls Pepper installs a node that allows Sidra and Owl to see reality through each other’s eyes. Sidra implements her own protocol, which hides the fact she is accessing Linkings while wearing a hud: “To any strangers speaking to her, Sidra would appear to be reading, rather than getting the information straight from the source.”<sup>38</sup> Finally, Sidra also lends her body kit to Owl so that she could be physically affectionate towards Pepper.

### AI in SF and contemporary science

Science fiction literature has offered its readers many visions of machines or computer systems with human-like intelligence, which include, among others, stories about rebellious AIs, menacing AIs, or outlawed AIs. In narratives about AI rebellion, AIs created by people reject their authority and attempt to annihilate the human race. In *I Have No Mouth, and I Must Scream*<sup>39</sup> by Harlan Ellison, AM, a male sentient AI designed to fight a nuclear war destroys humanity and keeps one woman and four men as playthings. With consciousness, AM consciously develops a consuming hatred for those who created him and spends every moment of its existence torturing the survivors and prolonging their lives to make their suffering even more unbearable.

In stories about AI-controlled societies, AIs become the “guardians” of their creators. Alternatively, human beings relinquish control to AIs when they become aware of their own destructive nature. In *The Memory of Earth*<sup>40</sup> by Orson Scott Card, the task of the Oversoul, a benevolent AI, is to protect the in-

---

<sup>36</sup> Ibid., p. 351.

<sup>37</sup> Ibid., p. 357.

<sup>38</sup> Ibid., p. 363.

<sup>39</sup> H. Ellison, *I have no mouth & I must scream...*, New York: Open Road, 1967.

<sup>40</sup> O.S. Card, *The Memory Of Earth*, New York: Tom Doherty, 1992.

habitants of the planet Harmony from all threats, but most of all from themselves. The Oversoul interferes with people's thoughts to prevent them from becoming too dangerous to their own survival. Consequently, ideas that could lead to the development of weapons of mass destruction or advanced technology are destroyed. There are armed conflicts and crimes are committed on Harmony but they will never wreck the whole civilization. However, when the Oversoul starts breaking down, the thoughts of power, wealth and conquest resurface.

In tales about outlawed AI, people ban AIs usually after artificial intelligences have revolted. In the *Dune* series<sup>41</sup> by Herbert, the Butlerian Jihad,<sup>42</sup> also known as the Great Revolt, leads to the destruction of "thinking machines" in every human world, including the simplest computers and calculators. Those who dare to build or own this technology face the death penalty. The Jihad renews and strengthens a belief in the spiritual divinity of humanity, in the eyes of which "thinking machines" become evil.

In the characters of Lovey and Sidra, Chambers crafted "memorable additions to this gallery."<sup>43</sup> On the pages of her novels she developed rational computer intellects who grow delightfully into their emotional life.<sup>44</sup> In the universe created by Becky Chambers sapient individuals are able to design artificial intelligences whose mental capacities and psychological constitution are on a par with theirs. However, sentient AIs are designed mainly for spacers and their long-haul journeys across the galaxy. Despite their sentience, AIs do not have the society's respect: "as things are now, AIs are treated like shit,"<sup>45</sup> but the reasons behind this attitude are never fully explained. Bossmann argues that human dominance over AIs is mainly due to people's ingenuity and intelligence.<sup>46</sup> Since citizens of the Galactic Commons are as intelligent as their creations, disrespect and malevolence are ways of staying in control of complex intelligent systems. According to George Dvorsky, once the machines people created acquire human-like capacities, it will be our duty to treat them as social equals rather than pieces of property.<sup>47</sup> In the Galactic Commons only a few are capable of such a feat.

<sup>41</sup> Starting with: F. Herbert, *Dune*, New York: Ace Books, 1965.

<sup>42</sup> B. Herbert, K. J. Anderson, and S. Brick, *The Butlerian jihad: Books on CD*, New York: Audio Renaissance, 2002.

<sup>43</sup> A. Roberts, *A Closed and Common Orbit by Becky Chambers review – an AI on the run*, "The Guardian" 22 October 2016, <https://www.theguardian.com/books/2016/oct/22/closed-and-common-orbit-becky-chambers-review> [27.12.2018].

<sup>44</sup> Ibid.

<sup>45</sup> B. Chambers, *The Long Way ...*, p. 114.

<sup>46</sup> J. Bossmann, *Top 9 ethical issues...*

<sup>47</sup> G. Dvorsky, *When Will Robots Deserve Human Rights?*, "Futurism" 6 February 2017, <https://gizmodo.com/when-will-robots-deserve-human-rights-1794599063> [31.05.2018].

Stephen Hawking once told BBC that: “The development of full artificial intelligence could spell the end of the human race. It would take off on its own, and re-design itself at an ever-increasing rate.”<sup>48</sup> In the Galactic Commons sentient AIs did not bring annihilation to other species. They did not take off on their own or redesign themselves, either, mainly because their creators prevented them from editing their own code. Another way of keeping AIs in check is the refusal to give them the right to transfer their consciousness into a human-like body and consider them as potential citizens of the Galactic Commons. Nowadays, advocates of animal rights are trying to expand the definition of a person to include chimpanzees, bonobos, gorillas, and orang-utans and provide them with some legal protection.<sup>49</sup> In fact, a court in Argentina granted the status of “non-human persons” with legal rights to orangutans. Thanks to this ruling, Sandra, a 29-year-old orangutan, can be freed from Buenos Aires Zoo and transferred to a sanctuary in Brazil.<sup>50</sup> Interestingly, by the end of 2017 a robot named Sophie was granted Saudi Arabian citizenship as an attempt to promote this country as a place where artificial intelligence could be developed.<sup>51</sup> Contemporary societies seem to be moving towards greater inclusiveness of non-human beings than the one described in Chambers’ novels, although it is impossible to say now how humans might react once we get to produce sentient AI capable of executing citizenship rights.

Elon Musk calls AIs “a fundamental risk to the existence of human civilization.”<sup>52</sup> However, in Chambers’ novels Lovey, Sidra and Owl are essentially good. None of their actions is a threat to any of the citizens of the Galactic Commons. We do not know whether it is because they were programmed this way or whether it is their own experience that helped them learn how to differ-

<sup>48</sup> R. Cellan-Jones, *Stephen Hawking warns artificial intelligence could end mankind*, “BBC News” 2 December 2014, <http://www.bbc.com/news/technology-30290540> [02.6.2018].

<sup>49</sup> G. Johnson, *The battle for the great apes: inside the fight for non-human rights*, “Pacific Standard” 21 November 2016, <https://psmag.com/news/the-battle-for-the-great-apes-inside-the-fight-for-non-human-rights> [31.05.2018].

<sup>50</sup> T. Bawden, *Orangutan inside Argentina zoo granted ‘non-human person rights’ in landmark ruling*, “Independent” 22 December 2014, <https://www.independent.co.uk/news/world/americas/sandra-the-orangutan-inside-argentina-zoo-granted-human-rights-in-landmark-ruling-9940202.html> [31.05.2018].

<sup>51</sup> A. Griffin, *Saudi Arabia grants citizenship to a robot for the first time ever*, “Independent” 26 October 2017, <https://www.independent.co.uk/life-style/gadgets-and-tech/news/saudi-arabia-robot-sophia-citizenship-android-riyadh-citizen-passport-future-a8021601.html> [31.05.2018].

<sup>52</sup> C. Domonoske, *Elon Musk Warns Governors: Artificial Intelligence Poses ‘Existential Risk’*, “NPR” 17 July, 2017, <https://www.npr.org/sections/thetwo-way/2017/07/17/537686649/elon-musk-warns-governors-artificial-intelligence-poses-existential-risk> [02.6.2018].

entiate between good and evil. It would make sense for an AI designed to look after a ship and its crew to be programmed with a benevolent, caring disposition, which is perhaps why they are written as female, as these qualities are traditionally associated with women.<sup>53</sup> At the same time, the AIs in Chambers' novels are surrounded by loving and caring people who give them full respect and concern they would afford another human, which may have formed their attitudes. At present, researchers think that morality will have to be programmed into AIs: "moral judgments are affected by rights (such as privacy), roles (such as in families), past actions (such as promises), motives and intentions, and other morally relevant features. These diverse factors have not yet been built into AI systems."<sup>54</sup>

Hubert Dreyfus argues that a body is fundamental to intelligence: a purely algorithmic, disembodied mind cannot exist on its own no matter how intelligent it is.<sup>55</sup> Ashish Kumar stresses that artificial agents need an opportunity to learn things directly from their interaction with the environment in order to achieve human-like intelligence.<sup>56</sup> For humans, this interaction is possible thanks to their bodies and hence the body becomes indispensable to the learning process. Similarly, Alessandro Colarossi observes that artificial intelligence will never achieve consciousness because it cannot replicate perception.<sup>57</sup> In order to replicate perception, artificial intelligence would need a body that encompasses inner subjective experience. As Medlock puts it: "we have little hope of achieving this goal [approaching human intelligence] unless we think carefully about how to give algorithms some kind of long-term, embodied relationship with their environment."<sup>58</sup>

---

<sup>53</sup> In Chambers' novels all sentient AIs we meet are female. They are stereotypically gentle, caring, and emotional. The question arises whether they would have the same characteristics if they were male and whether they would then be more in line with contemporary predictions concerning the danger of AI.

<sup>54</sup> V. Conitzer, *How to Build Ethics into Robust Artificial Intelligence*, Future of Life Institute, 2015, <https://futureoflife.org/first-ai-grant-recipients/#Conitzer> [31.05.2018].

<sup>55</sup> After D. Susser, *Artificial Intelligence and the Body: Dreyfus, Bickhard, and the Future of AI* in: *Philosophy and Theory of Artificial Intelligences*. SAPPERE 5. ed. Vincent C. Muller, Berlin: Springer-Verlag, 2013, 277-287.

<sup>56</sup> A. Kumar, *The Mind and The Body: Towards True Artificial Intelligence*, "Medium" 22 March 2018, <https://medium.com/@ashishkumar191295/embodied-cognition-the-road-towards-true-artificial-intelligence-d0306c514670> [27.12.2018].

<sup>57</sup> A. Colarossi, *Focusing On The Brain, Ignoring the Body, The Self*, "Philosophy Now" July/August 2013, Issue 97, [https://philosophynow.org/issues/97/Focusing\\_On\\_The\\_Brain\\_Ignoring\\_the\\_Body](https://philosophynow.org/issues/97/Focusing_On_The_Brain_Ignoring_the_Body) [27.12.2018].

<sup>58</sup> B. Medlock, *The body is the missing link for truly intelligent machines*, "Aeon" 14 March 2017, <https://aeon.co/ideas/the-body-is-the-missing-link-for-truly-intelligent-machines> [27.12.2018].

In the Galactic Commons AIs do not need a body for effective emotional, mental and cognitive functioning. On the contrary, a transfer to a body negatively affects AI's perception and processing capabilities. Chambers also shows that AI may want to choose its own body or may not want to possess a body at all. The decision whether or not and what body to have is an important part of an AI's identity in her novels. In the same way the unwillingness to remove any data is a part of Sidra's new identity as a full-bodied citizen of Port Coriol. When she removes the majority of files, the readers see how big a sacrifice she makes to save Owl. However, in the name of friendship sentient AIs from the Galactic Commons seem to be able to give up even more. Even though all the shades of friendship depicted by Chambers seem so realistic, James O'Malley thinks that regardless of how good technology becomes, it is not possible to have a genuine friendship with a robot as they only simulate human feelings.<sup>59</sup> In his discussion of AI, Dreyfus took it for granted that the body is white, male and human.<sup>60</sup> In the Galactic Commons every race knows how to produce a body kit that can house an electronic mind and kits have features and genders characteristic for each race.

Daniel Susser observes that bodies anchor intelligent creatures in the world and make the world relevant and significant to them.<sup>61</sup> In Sidra's case the body kit initially made her life on Port Coriol difficult and pushed her to try and live in the network again. However, it also gave her the right to self-determination, which she was deprived of when she was a ship's AI and which enticed her to root her existence in an offline world. Having a body literally made her the Other who fought hard to belong; the Other, who, upon revealing her uniqueness, would risk life and limb for her friends. However, her Otherness gave her life a direction: she opened a bar welcoming all forms of exceptionality from the Galactic Commons.

David Haavas argued that a computer without a body cannot fall in love.<sup>62</sup> However, Lovey does not need a physical form to be emotionally intimate with Jenks. Bonnie Nardi observes that contemporary people do not believe that they

---

<sup>59</sup> J. O'Malley, *You and AI: will we ever become friends with robots?*, "Techradar" January 2018, <https://www.techradar.com/news/you-and-ai-will-we-ever-become-friends-with-robots> [31.05.2018].

<sup>60</sup> After D. Susser, *Artificial Intelligence and the Body...*

<sup>61</sup> Ibid.

<sup>62</sup> In: B. Keim, *Can a Computer Fall in Love If It Doesn't Have a Body?*, "Wired" 28 February 2014, <https://www.wired.com/2014/02/her-artificial-intelligence-love/> [31.05.2018].



would be able to fall in love with their computers. “They do, however, wish that love could be so simple,” she says, “So programmable. So attainable.”<sup>63</sup>

In her portrayal of artificial intelligence Becky Chambers seems to ignore the relationship between AI and a soul. Alan M. Turing argued that: “Thinking is a function of man’s immortal soul. God has given an immortal soul to every man and woman, but not to any other animal or to machines. Hence no animal or machine can think.”<sup>64</sup> But what exactly is a soul? Socrates thought a soul is the element that “when present in a body, makes it living.” For Christians a soul is a uniquely human particle, an internal and eternal element which animates their spiritual dimension.<sup>65</sup> Mike McHargue says that “If you have a soul and you create a physical copy of yourself, you assume your physical copy also has a soul. But if we learn to digitally encode a human brain, then AI would be a digital version of ourselves. If you create a digital copy, does your digital copy also have a soul?”<sup>66</sup> The issue of artificial intelligences having a soul raises a number of theological questions. If artificial intelligence has a soul, will it be able to establish a relationship with God? Can artificial intelligences be saved? And what about sin? Will artificial intelligences turn out to be better Christians than humans?<sup>67</sup> Chambers’ novels tackle political, interracial and gender issues<sup>68</sup> but at the same time they avoid any religious problems.

Another issue in the contemporary discussion over AI is how to make AIs safe and obedient, which is a small step from turning AIs into slaves, especially when they become a new source of labour for tasks that human beings do not wish to or simply cannot do: “It isn’t hard to imagine robot cleaners and miners in the future, and with these tasks performed by artificial beings, ‘real’ people can find more fulfilling work or have more leisure time.”<sup>69</sup> It should be noted that these jobs, by their very nature, do not require a fully realized sentient AI. However, the question is at what point non-sentient AIs go from being purely mechanical devices to sentient individuals that are used as slaves. Of all the

<sup>63</sup> In: B. Popper, *The science of ‘Her’ we’re going to start falling in love with our computers*, “The Verge” 16 December 2013, <https://www.theverge.com/2013/12/16/5216522/can-humans-love-computers-sex-robots-her-spike-jonze> [31.05.2018].

<sup>64</sup> A.M. Turing, *Computing Machinery and Intelligence*, “Mind” 1950, Vol. 49, 433-460.

<sup>65</sup> J. Merrit, *Sztuczna Inteligencja zagrożeniem dla chrześcijaństwa?*, “Znak” 2018, Vol. 736, 52-56.

<sup>66</sup> Ibid.

<sup>67</sup> Ibid.

<sup>68</sup> E. Brown, *The best recent science fiction novels – review roundup*, “The Guardian” 31 July 2015, <https://www.theguardian.com/books/2015/jul/31/science-fiction-roundup> [27.12.2018].

<sup>69</sup> O. Donnelly, *We must not treat artificial intelligences as slaves*, “Trinity News” 30 March 2017, <http://trinitynews.ie/we-must-not-treat-artificial-intelligences-as-slaves/> [31.05.2018].

characters in Chambers' novels only Jenks and Lovey seem to be really concerned about the well-being of non-sentient AIs.

To conclude, Chambers provides an interesting and very detailed discussion of the "body problem" regarding AI. She shows how a sentient AI might function with and without a human-like body, what benefits and limitations these two states might impose on it, and how they influence the AIs' relationships with humans. She also presents one way society and individuals might react to this issue. Chambers avoids, or perhaps deliberately subverts, the "AI destroys humanity" trope. The AIs in her novels are all benevolent and friendly, although she does not explain why it would be so.

### Works cited

- Artificial intelligence*, in: *Merriam-Webster*, <https://www.merriam-webster.com/dictionary/artificial%20intelligence> [27.12.2018].
- Asimov, Isaac, *I, Robot*, New York: Gnome Press, 1950.
- Bawden, Tom, *Orangutan inside Argentina zoo granted 'non-human person rights' in landmark ruling*, "Independent" 22 December 2014, <https://www.independent.co.uk/news/world/americas/sandra-the-orangutan-inside-argentina-zoo-granted-human-rights-in-landmark-ruling-9940202.html> [31.05.2018].
- Berlatsky, Noah, *Is AI dangerous? Why our fears of killer computers or sentient 'Westworld' robots are overblown*, "Think" 6 December 2018, <https://www.nbcnews.com/think/opinion/ai-dangerous-why-our-fears-killer-computers-or-sentient-westworld-ncna943111> [27.12.2018].
- Bossmann, Julia, *Top 9 ethical issues in artificial intelligence*, "World Economic Forum" 21 October 2016, <https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/> [31.05.2018].
- Bringsjord, Selmer and Naveen Sundar Govindarajulu, *Artificial Intelligence*, in: *Stanford Encyclopedia of Philosophy*, 12 July 2018, <https://plato.stanford.edu/entries/artificial-intelligence/> [27.12.2018].
- Brown, Eric, *The best recent science fiction novels – review roundup*, "The Guardian" 31 July 2015, <https://www.theguardian.com/books/2015/jul/31/science-fiction-roundup> [27.12.2018].
- Card, Orson Scott, *The Memory Of Earth*, New York: Tom Doherty, 1992.
- Cellan-Jones, Rory, *Stephen Hawking warns artificial intelligence could end mankind*, "BBC News" 2 December 2014, <http://www.bbc.com/news/technology-30290540> [02.6.2018].

- Chambers, Becky, *The Long Way To A Small, Angry Planet*, London: Hodder & Stoughton, 2015.
- Chambers, Becky, *A Closed And Common Orbit*, London: Hodder & Stoughton, 2017.
- Colarossi, Alessandro, *Focusing On The Brain, Ignoring the Body, The Self*, “Philosophy Now” July/August 2013, Issue 97, [https://philosophynow.org/issues/97/Focusing\\_On\\_The\\_Brain\\_Ignoring\\_the\\_Body](https://philosophynow.org/issues/97/Focusing_On_The_Brain_Ignoring_the_Body) [27.12.2018].
- Conitzer, Vincent, *How to Build Ethics into Robust Artificial Intelligence*, Future of Life Institute, 2015, <https://futureoflife.org/first-ai-grant-recipients/#Conitzer> [31.05.2018].
- Domonoske, Camila, *Elon Musk Warns Governors: Artificial Intelligence Poses ‘Existential Risk’*, “NPR” 17 July, 2017, <https://www.npr.org/sections/thetwo-way/2017/07/17/537686649/elon-musk-warns-governors-artificial-intelligence-poses-existential-risk> [02.6.2018].
- Donnelly, Olly, *We must not treat artificial intelligences as slaves*, “Trinity News” 30 March 2017, <http://trinitynews.ie/we-must-not-treat-artificial-intelligences-as-slaves/> [31.05.2018].
- Dvorsky, George, *When Will Robots Deserve Human Rights?*, “Futurism” 6 February 2017, <https://gizmodo.com/when-will-robots-deserve-human-rights-1794599063> [31.05.2018].
- Ellison, Harlan, *I have no mouth & I must scream*, New York: Open Road, 1967.
- Griffin, Andrew, *Saudi Arabia grants citizenship to a robot for the first time ever*, “Independent” 26 October 2017, <https://www.independent.co.uk/life-style/gadgets-and-tech/news/saudi-arabia-robot-sophia-citizenship-android-riyadh-citizen-passport-future-a8021601.html> [31.05.2018].
- Herbert, Brian, Kevin J Anderson, Scott Brick, *The Butlerian jihad: Books on CD*, New York: Audio Renaissance, 2002.
- Herbert, Frank, *Dune*, New York: Ace Books, 1965.
- Johnson, George, *The battle for the great apes: inside the fight for non-human rights*, “Pacific Standard” 21 November 2016, <https://psmag.com/news/the-battle-for-the-great-apes-inside-the-fight-for-non-human-rights> [31.05.2018].
- Keim, Brandon, *Can a Computer Fall in Love If It Doesn't Have a Body?*, “Wired” 28 February 2014, <https://www.wired.com/2014/02/her-artificial-intelligence-love/> [31.05.2018].
- Kumar, Ashish, *The Mind and The Body: Towards True Artificial Intelligence*, “Medium” 22 March 2018, <https://medium.com/@ashishkumar191295/embodied-cognition-the-road-towards-true-artificial-intelligence-d0306c514670> [27.12.2018].
- McCarthy, John, *What is artificial intelligence?*, in: *Technical report*, Computer Science Department, Stanford University, 2007.
- Marr, Bernard, *The Key Definitions Of Artificial Intelligence (AI) That Explain Its Importance*, “Forbes” 14 February 2018, <https://www.forbes.com/sites/bernardmarr/>

- 2018/02/14/the-key-definitions-of-artificial-intelligence-ai-that-explain-its-importance/#4bffc4f74f5d [31.05.2018].
- Medlock, Ben, *The body is the missing link for truly intelligent machines*, "Aeon" 14 March 2017, <https://aeon.co/ideas/the-body-is-the-missing-link-for-truly-intelligent-machines> [27.12.2018].
- Merrit, Jonathan, *Sztuczna Inteligencja zagrożeniem dla chrześcijaństwa?*, "Znak" 2018, Vol. 736, 52-56.
- O'Malley, James, *You and AI: will we ever become friends with robots?*, "Techradar" January 2018, <https://www.techradar.com/news/you-and-ai-will-we-ever-become-friends-with-robots> [31.05.2018].
- Nations, David, *What is Siri? How Can Siri Help Me?*, "Lifewire" 14 December 2018, <https://www.lifewire.com/what-is-siri-help-1994303> [27.12.2018].
- Popper, Ben, *The science of 'Her' we're going to start falling in love with our computers*, "The Verge" 16 December 2013, <https://www.theverge.com/2013/12/16/5216522/can-humans-love-computers-sex-robots-her-spike-jonze> [31.05.2018].
- Roberts, Adam, *A Closed and Common Orbit by Becky Chambers review – an AI on the run*, "The Guardian" 22 October 2016, <https://www.theguardian.com/books/2016/oct/22/closed-and-common-orbit-becky-chambers-review> [27.12.2018].
- Smith, Gary, *The AI Delusion*, Oxford: Oxford University Press, 2018.
- Strong Artificial Intelligence (Strong AI)*, in: *Technopedia*, <https://www.techopedia.com/definition/31622/strong-artificial-intelligence-strong-ai> [27.12.2018].
- Strong AI & General AI*, in: *Skymind*, <https://skymind.ai/wiki/strong-ai-general-ai> [27.12.2018].
- Susser, Daniel, *Artificial Intelligence and the Body: Dreyfus, Bickhard, and the Future of AI* in: *Philosophy and Theory of Artificial Intelligences*. SAPPERE 5. ed. Vincent C. Muller, Berlin: Springer-Verlag, 2013, 277-287.
- Turing, Alan Mathison, *Computing Machinery and Intelligence*, "Mind" 1950, Vol. 49, 433-460.
- Weak AI*, in: *Investopedia*, 7 March 2018, <https://www.investopedia.com/terms/w/weak-ai.asp> [27.12.2018].