

# The Adventures of Older Authors: Exploring Futures through Co-Design Fictions

Aloha Hufana Ambe, Margot Brereton, Alessandro Soro, Laurie Buys, Paul Roe

Queensland University of Technology (QUT)

Brisbane, Queensland, Australia

{a.ambe, m.brereton, a.soro, l.buys, p.roe}@qut.edu.au

## ABSTRACT

This paper presents *co-design fiction* as an approach to engaging users in imagining, envisioning and speculating not just on future technology but future life through co-created fictional works. Design fiction in research is often created or written by researchers. There is relatively little critical discussion of how to co-create design fictions with end-users, with the concomitant opportunities and challenges this poses. To fill this gap in knowledge, we conducted *co-design fiction* workshops with nine older creative writers, utilising prompts to inspire discussion and engage their imaginative writing about the trend towards tracking and monitoring older people. Their stories revealed futures of neither dystopia nor utopia but of social and moral dilemmas narrating their wish not just to “maintain their independence”, but a palpable desire for adventure and very nuanced senses of how they wish to take control. We discuss inherent tensions in the control of the *co-design fiction* process; balancing the author’s need for freedom and creativity with the researcher’s desire to guide the process toward the design investigation at hand.

## CCS CONCEPTS

• **Human-centered computing** → **HCI design and evaluation methods**; *Design Method*; *Co-Design*.

## KEYWORDS

Design fiction; co-creation; creative writers; older adults; monitoring technology.

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## 1 INTRODUCTION

We present *co-design fiction*, an approach to creating design fiction by engaging users to create their own fictional works, anchored in their own beliefs and convictions, in order to capture how they personally imagine, envision and speculate not just on future technology but future life.

Design fiction in research has various purposes and takes on various forms, but often is written or made by researchers. Researchers typically create a diegetic prototype - a technology that does not yet exist in the real world but is considered real and functional in the fictional narrative [64,65]. Diegetic prototypes in Human-Computer Interaction (HCI) have taken on a variety of forms: inspiring or reflective artefacts, such as imaginary workbooks [12] and questionable design concept cards [71]; written narrative works, such as fictitious research papers and imaginary abstracts [8,28,45]; or creative outputs of the design process such as imaginary posters, product catalogues and design workbooks inspired by science fiction[13,17,77]. Researchers play a strong role in framing the topic and making the creative output itself. In design fiction, there is a growing body of research that has fostered non-researcher participants, as potential future dwellers, to creatively express their own imagined futures [10,37,38,49,57]. However prior works have mostly emphasised the problem being addressed, rather than the method itself, and lack an articulation of the inherent tensions of involving participants in the co-creation process. Moreover the process and outputs almost always tend towards dystopian or utopian futures. Appreciating the richness of perspective that fiction can reveal, our research investigated how to involve potential focal user groups, specifically hobbyists and in this particular case

amateur creative writers, to create personal fictional works in order to explore future life.

We conducted *co-design fiction* workshops with nine older creative writers. The aim of the workshops was to capture their perspectives about the technology trend towards supporting older people by tracking and monitoring them [5,22,26,58]. With rapid ageing population growth, the inclusion of older adults in the discussion and design of future technology has been gaining interest [1,43], in both co-design workshops [40,60] and long-term projects [14,44] that explore their perspectives for future technology and living, unearthing inherent challenges in translating design into value in their everyday lives [40,74].

Through the *co-design fiction* workshop older adults' wrote individual literary works. The workshop discussions and literary works showed that older authors were keen to engage in this form of co-creation though writing, and their stories revealed novel perspectives to inform design. They did not write futures of dystopia or utopia but rather of social and moral dilemmas, notably their wish not merely to "maintain their independence", but demonstrating a palpable desire and hope for adventure and a very nuanced sensibility to issues of agency and control. We discuss the tensions inherent in co-design fiction, which relate to control of the process and marrying the creator's need for freedom, with the researcher's desired topic of inquiry.

Our research contribution is twofold: (1) The primary contribution is the *co-design fiction* as an alternative approach to design fiction that: (1a) involves participants in many stages of the approach especially during workshop planning, (in recognition of their expertise on their own creative processes, being the best persons to consult on what 'materials' to bring and how to go about the process) and also in consultation on the research paper draft that described the analysed data; (1b) acknowledges and reconciles different creative processes of participants to respect each participants' creative process; (1c) attempts to mediate and balance inherent tensions of co-creation of design fiction, especially the participant's need for creative freedom in the process of creating/making/writing the design fiction, and the research team's desire to guide the process towards the investigation at hand. We detail the co-creation process, explicating the method, inherent tensions, engagement strategies, and illustrating the benefits through the new design insights gained. (2) The secondary contribution is the findings from the fictional literary works that opens

up a critical discourse that goes beyond the common utopian and dystopian discussions around fictional accounts of technology experience.

## 2 BACKGROUND

Design fiction is similar to science fiction in that both represent imagined futures with imaginary prototypes featuring in the story [11,64,65] to foreground the role of technology and its social and cultural implications [23,73]. Bruce Sterling, a science fiction author working on design fiction [64], stressed that "[in] *design fiction*, one now needs to be more thoughtful and to consider many factors in the event this design fiction may be used in the real world" [65].

### 2.1 Design Fiction in HCI research

Design fiction has paved a novel avenue in imagining, conceptualizing and speculating future designs of technology. There is emphasis on diegetic prototypes in CHI when using design fiction. These are technologies that are still non-existent in the real world but are considered real and functional in the fiction narrative [11,36,64,65]. They serve as a concrete element for speculation, critique or reflection. The form of design fiction in HCI research varies in relation to the purpose of the research – as a tool for inquiry in speculative design research [27] or as a lens to speculate futures [12,13,71] e.g. fictitious research [8,45,46], speculative video [66], fictitious ads [68], or literary works [51,57], etc. The "variety of incongruent perspectives on what design fiction is and how to use it" has motivated Coulton et al to disambiguate approaches and promote genre conventions, in particular a genre of "world building" [20]. Others see room for greater creativity and power in design fiction, with Blythe and Encinas finding that design fictions are generally "scientistic" in a way that they are used for exploration by researchers and designers. This indicates untapped possibilities of design fiction [11] such as shifting the role of who creates it.

Fiction exposes its creator or writer's existing cultural stand [23,73] and serves as a platform for presenting embedded values and ideas [34]. Researchers and designers have the prospective users' inputs and points of view in mind when envisioning futures, but still bring their own positionality based on their own background, beliefs, and world views reflected in their intended purpose of the research. This was emphasised by Encinas et al [28] who used imaginary abstracts to show how one data source can be interpreted in very different ways,

depending on the researcher's moral and ethical principles.

There is a growing body of research looking at co-creation of design fictions. Blythe and colleagues encouraged their “magic machine” workshop participants to come up with absurd futuristic designs. Breaking away from the tradition of solution-focused research they provoked participants to build their own design fiction to express their “anxieties, fears, hopes and desires” [10]. Similarly, Tseklevs et al's work [69] with healthcare and older adults focused on generating design ideas for assisted living and assisted death and evaluating their acceptability with potential users. Prost et al engaged participants' in a workshop to creatively and collaboratively narrate a future with sustainable energy, agreeing upon a set of story parameters. The stories narrated dystopian futures of controlled and monitored energy use that showed social practices and issues to be addressed. They found interesting insights for the problem at hand but did not elaborate on the group process itself [57]. Markussen and Knutz engaged design students to elaborate imaginary futures based on a dystopian novel, and then to translate these into prototypes. [49]. See also [37]. The research team of FabPod, an enclosed collaborative design space [2], worked with creative writers to explore the space and write about their experience inside the space in an essaying activity. The creative writers wrote what the FabPod is to them and what it could be, opening a different vantage point for the researchers. These co-created design fictions are insightful however the emphases are on the problem and design responses rather than the method. The inherent tensions of involving participants in the process are not extensively discussed and the process and outputs lean towards dystopian or utopian futures.

Drawing upon personal influences and lived experience, design fiction can convey the powerful personal messages of its creators. Informed by Bleeker [7], Dourish and Bell [23] and Reeve's [59] work on design fiction, and basing our definition on that of Wakkary et al [73] we define design fiction as a “*powerful creative and playful*” envisioning of futures that can either be “*read or produced*” in different narrative forms that “*manifest relationships among people, practice, and technology*” reflecting a critical understanding of the present. Our approach follows that of Blythe [8,9], expressing design fiction in written narrative form.

## 2.2 Writing a Design Fiction Story

A fiction is an artistic form of expression through an imagined world that the writer is immersed in, experiencing their characters with all their senses, just as we experience our everyday [24]. Fiction writers operate within a unique rhythm of engagement and reflection when they write [61] as they move between their fiction world where imagination is limitless and the writing realm where literary concerns reside [24]. In writing design fiction, Sterling claims “*to trade imaginary constraints of writing for the imaginary constraints of design*” [65]. A consideration of design fiction is the accountability of those who write it. Ann Light emphasises the accountability that comes when one is writing for ‘the others’ involved in a design process but who are not actively involved in writing about it. She asserts that writing based from a participatory design (PD) method is often led by academic publishing models and that there is little discussion in bringing in ‘the others’ in this respect [42]. As designers and researchers, there is hesitation to write design fiction stories, due to lack of perceived skill. Collaborating with fiction writers is one option but may not be always practical according to Blythe (2017). He recommends that designers and researchers develop a better understanding of the storytelling process and awareness of plot, and describes common techniques [9].

While narrative form has been used to widen perspectives on a subject in question [49] there is a common theme within research led narrative design fiction of utopian futures [34] or dystopian worlds [38,49]. We were intrigued to work with older adult amateur creative writers, in order to explore the kinds of technology enabled futures that they might envisage for older adults in their narrative design fictions.

## 2.3 Older People and Technology

There is a proliferation of products and services for older people under the umbrella of smart devices, Internet of Things applications [22,26,58,62] and other new forms of tracking and monitoring technologies [55,63,72], such as fall detectors, pill management devices and activity trackers. The Forbes article's “10 Ways The Internet of Medical Things Is Revolutionizing Senior Care” [21] caught our attention as all items on the list have some form of monitoring in them. This made us wonder what older people thought of these technologies envisioned for them. We took this theme as a provocation and an inspiration for participants.

The CHI community has increasing interest in involving older people in the design process through co-design [14,40,44,60] although researchers have found it challenging to engage older adults [40,74] to articulate the value of new technologies in their everyday life. Older people are encouraged to age positively [29,52], actively [19,78] and independently [55,75], and they have shown creative ways [15,32,48,70,79] of maintaining life throughout a lifetime. The technology trend of tracking and monitoring represents a perspective that oversimplifies old age into simply managing one's declining physiological health. Such a perspective limits technology innovators from envisioning a truly fulfilling life for older people. Appreciating the power of words in narrative form and inspired by prior work on design fiction we collaborated with nine older creative writers to articulate their perspective on future technology.

### 3 THE APPROACH: CO-DESIGN FICTION

*Co-design fiction* is an approach that engages users by foregrounding their experiences, values and convictions in co-created fiction with the aim to imagine, envision and speculate futures not just on technology but on future life. Specifically, we worked with older amateur creative writers in *co-design fiction* workshops to investigate their perspectives on the trend of monitoring and tracking technology. In related work, Gaver engaged professionals he described as Cultural Commentators - movie screenwriters, film-makers, journalists, etc. [31] - in polyphonic assessments of prototypes. In our approach the participants were neither professionals (as in Cultural Commentators) nor complete laypersons (as in many probes based methods), but were both experienced hobbyists of creative writing and experts in the domain of being older adults. This being experts in both domains is distinctly different from domain experts and community members collaborating. Our work emphasises the perspective of the focal group of users.

#### 3.1 Before the Workshop

We engaged with potential participants by contacting the instructors of writing classes for older people and asking to attend in order to discuss the prospect of them creating design fictions with us. We were invited to attend the classes. In our first class we witnessed the students share their story from the previous week's assignment. We also learned how the lecturer, Ted (pseudonym) imparted knowledge on building characters. In our second meeting, we met another group of older women, led by Val, who have been together for several years. There is no lecturer;

the group meets once a week bringing in two printed copies of their novella, play, thriller or poem for everyone to read. They then discuss and constructively critique each work.

Having got to know the two groups of writers and discussed the project, the writers expressed interest in participating. We proposed an initial *co-design fiction* workshop agenda to them for feedback. As experts in the creative writing process, we felt that they would know best how to conduct a workshop that involves creative writing. The first author consulted Ted as the class' lecturer. He was happy with the proposed flow such as having the writing session within the workshop time for his class. The women of the writing group, however, requested to be given a week's time after the workshop proper before giving us their stories. They expressed that it takes time to "*put pen to paper*". Acknowledging the different writing preference of the Class and the Group we conducted two *co-design* workshops with different writing timeframes. All of the writers agreed that it would be difficult for them to write a single story as a group and that they preferred writing individually. The first workshop was with Ted and one of his students. The second workshop was with the seven members of the Group. The writers were each given a \$25 gift card to express gratitude for their participation.

#### 3.2 The Participants

We worked with a total of nine creative writers, two from the Class and seven from the Group; they are aged between 60-86 years old with a mean age of late 60s; eight are Caucasians and one is of Maori descent. The two participants from the Class are male, Ted and his student of seven months Greg (pseudonym). Greg is an avid fiction reader and a novice writer who formerly worked in construction. Ted, a poet, is a former firefighter and a military man before he completed a creative writing degree. The seven participants from the Group are Val, Jenny, Catherine, Judith, Brenda, Julie and Winnie. They come from different professional backgrounds of sales, marketing, education and even archaeology, but their passion for writing led them to the group. The writers have a close-knit relationship having been together for several years. They self-published their book *Time and Tide* a collection of their best and favourite authored short stories. Their friendship and support system helped them to develop their writing talent and abilities through their weekly sessions. As writers they admit that they are observant and constantly curious, making anything around them a potential spark for inspiration. They also

expressed that their life-long experiences and social relations enable them to enrich their stories and the characters they create. Julie said, “...*I don’t think anything will ever replace that. That’s what’s in us and you only gather this in your world.*”

We note that in other demographics and cultures with different literacies we anticipate that co-design fiction approaches would take different forms [35,67].

### 3.3 The Workshop

After consultation and consideration of the participants’ preferences, the workshops were finalised. They ran for three hours in a library conference room.

**3.3.1 Beginning the Workshop.** We introduced the project of engaging older adults to imagine future technology through design fiction by discussing current trends on monitoring and tracking. To scope the topic, we focused to medication management tools, as emerging technologies in this area are rife. We briefly explained design fiction, anchoring its explanation to the more familiar genre of science fiction. Before the first activity, we asked everyone to introduce themselves and when their love of writing started.



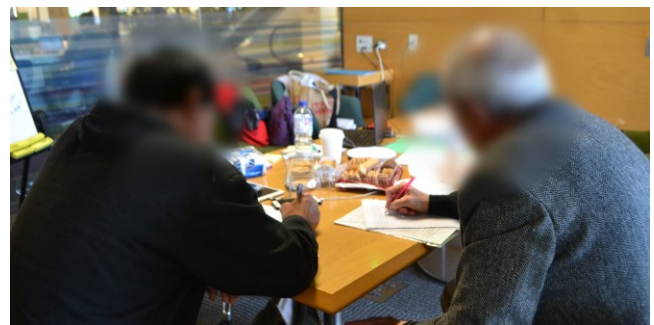
**Figure 1:** (L-R) Judith, Brenda, Jenny, Winnie, Val, Catherine and Julie of the creative writing group viewing one of the prompts.

**3.3.2 Prompts and Group Discussion.** We presented four prompts/provocations relating to pill management and monitoring applications for older adults and asked our participants to discuss their thoughts on them (Fig. 1). The first prompt was two screen shots of the Google images search result for the keywords “older adult” with “pill taking” and then “pill taking device” respectively. This prompt allowed the group to see how this situation is represented to wider society in the Google image search and prompted them to talk about their experience or knowledge of medication taking situations. The second prompt was the speculative video “Uninvited Guests” [66] about the possible future use of the Internet of Things in the life of an older adult. This prompt depicts future home life with technology embedded into everyday objects, such

as a spoon that counts calories or a walking cane that measures activity, having agency in the home. The third prompt was a video of The Messaging Kettle [3,16], an existing prototype that connects an older adult with their loved one through the routine of making tea. This video shows the possibility of technology that fosters social interaction, reciprocity and a feeling of everyday togetherness. The last prompt was an infomercial of a medication reminder device. As an existing product, the infomercial showcased the device for an elderly mother through the perspective of her daughter and son-in-law. Each prompt showed different narratives. Group discussion was facilitated in-between prompts to tease out the participants thoughts on the topic.

**3.3.3 Brainstorming: storytelling, plot, characters and message.** When the last prompt discussion finished, we then proceeded to an overall discussion of the prompts as well as possible plots, settings and themes of their stories. Questions and concerns were raised such as whether the fiction should have a diegetic prototype, whether there should be a technology in the story or whether the group set parameters before they write. The research team gave full creative freedom to the participants by not restricting them to any parameters or requiring a diegetic prototype in the story. We emphasised that what is important is that the fiction is inspired from the prompts, the discussion and their personal reflections and creative imaginations.

**3.3.4 Writing process and the reading session.** Ted and Greg from the first workshop opted to write the stories immediately, and took 30 minutes after the brainstorming to finish their stories (Fig. 2). After writing, they read their story and we then discussed it including the message that the story conveyed.



**Figure 2:** Greg and Tom writing after the group discussion.

The participants of the second workshop wanted the prompts and discussion to marinate before they started writing. During the reading session a week after the workshop, they shared the different moments when they found the “bubble” to start writing. Some got the story, the

characters and even the start and end scene just after the previous week's workshop. They just needed time to arrange the scenes in their head. Some preferred to research further on the topic. Some got additional inspiration based on what they saw on TV or gleaned through personal encounters. Others focused on their message, changing the medium of output from a fiction short story to a poem and an essay. Judith preferred to handwrite her full story first before word processing for printing. Brenda used the iPad Speak application to record her thoughts for the story before finally word processing from draft to final version. For each writer, the writing process involves their own unique method of writing, reflecting and editing until they feel their story is finished. The prompts and discussions served as the "bubble generator" of ideas for the writers to put pen to paper and framed the topic of creative inquiry. The resulting literary works reflected rich points of view derived from personal experiences, beliefs and convictions, crystallised by their writing approach.

Once the stories had been created, the authors met to take turns to read them aloud. The reading session was not only fun and enlightening for everyone but it gave an insight into how the authors created their stories. The stories made the audience of authors laugh and sigh, sentimental as they experienced the emotional ride that stories took them on. Once the reading was done, there were moments of heartfelt praise and awe by everyone. Everyone then reflected and shared their thoughts.

**3.3.5 Data Analysis.** We took an inductive and iterative approach to the analysis. After each encounter with the writers, the research team debriefed to unpack the experience. At the post co-design fiction workshop debriefing we discussed what had happened, interesting observations, challenges and important points made by the writers themselves. The first author transcribed the debriefing discussions, which were recorded, and field notes from writer's discussions, which included the researchers' impressions. Content analysis was undertaken to draw themes from the transcriptions. The initial themes were medication issues encountered; circle of support; care and distress; choices and control of own life; society's stereotype on old age; relationships with technology; and being happy, fearless and human. The nine stories were synthesised and summarised in tabular form indicating the plot, characters, problem/situation, resolution and their messages. With the breadth of data - the literary outputs, the workshop notes and the team debriefing notes - the research team reconvened to

collaboratively analyse the data again, mindful of the initial themes drawn, to highlight interesting and significant final themes. A common theme of "desire for adventure" arose in many of the stories, even though in discussions the authors had only expressed a desire to "maintain their independence", "live life and be happy", common tropes describing what older people want. However, our paper title, "Adventures of Older Authors" and its findings met with a ringing endorsement from the group of creative writers, who also read a full draft of this paper. Thus, synthesising findings not only from the workshop discussions, but also from the fictions and checking back with the authors were key steps in the analysis.

#### 4 FINDINGS

The nine writers engaged with the *co-design fiction* process and wove their raw and emotional experiences and imaginings with technology into their literary works. Giving creative freedom to the writers, seven of them wrote compelling stories with distinct characters:

- (1) ***Ripening*** by Catherine. Margaret and Brian, an elderly couple found renewed mobility and freedom through their newly purchased driverless car. What they thought was a prayer answered turned into a nightmare.
- (2) ***Last Tango in Eden Gardens*** by Brenda. Grace and Daphne, adventurous friends, trialled a time transporter built by Grace's grandson. What was meant to be a short visit to the 1920s might just be their last escapade.
- (3) ***The Earth Dilemma*** by Jenny. Liberty faces a seemingly difficult life decision – to live in a new world where her body is perfectly healthy or to be in the world she knows with the struggles of an ageing body. To Liberty the decision is easy.
- (4) ***Family – Near and Far*** by Judith. Bette, an elderly woman dealing with her ageing body happily reflects her living situation and relationships.
- (5) ***Waste of Space*** by Val. A day in the life of Zedra and her mother living in a world of technological convenience and breakdowns, space shuttles and chore-less home life; with the help of their companion robots.
- (6) ***Untitled*** by Ted. Mary's journey after the loss of her husband, from being a couple to living alone in a retirement village, she copes with the changes in her life.
- (7) ***Untitled*** by Greg. John lives alone in an intelligent home. The story narrates his life once he gets inside his home and reflects on the things that matter most.

Two participants took a different path by writing their personal thoughts on the topic in an essay and a poem:

(1) *What do I really Need?* by Winnie An essay of the author's reflections on an emergency care pendant when a friend said that she is "vain" for refusing to have one.

(2) *An Oldy's Lament* by Julie. A poem by an 86 year-old expressing her thoughts and feelings engendered by the insatiable advancements of current technology.

The workshop discussions revealed a strong theme of older adults' need to have control, freedom and liberty to choose how to live their lives. The literary outputs revealed how this need is concretised in narrative with a strong message on older people's hopes and desires for adventures as they navigate a world that resembles Foucault's Panopticon metaphor [30] - a world of social control and *invisible* power over a group of people. The messages are weaved into the plot, characters and themes of their stories. Design fictions often have plots of 'voyage and return' in which characters seek answers or 'a quest' in which they embark on an exploration [9]. In contrast, our participant's stories have characters who know what they want and who already have the answers within them. Their stories were not of hero's journeys, 'overcoming the monster' [9], or coming of age, because they are already of age. Our older writers focussed on everyday living, navigating the character's life in a future world and exploring the nuances of maintaining a 'life' in later life. The narratives shift the focus:

- (1) from "what technology can do for people" to "what technology does to people and their relations" through *technology's symbolism* in the story;
- (2) from "maintaining independence" to choosing adventure shown in the characters' *fearlessness of known and unknown troubles*; and
- (3) from utopian and dystopian scenarios to social and moral dilemmas represented in *the irony of an imperfect world*.

We unpack these story findings, which are also reflective of the group discussion, and then present insights in response to the panoptic design trends of technology for older people, in order to show the kinds of findings that the method elicited. We illustrate these three messages by referring to the first three stories.

#### 4.1 From futures of "What technology can do for people" to "What technology does to people"

The authors never focus on the functionality of technology itself but rather focus on its incidental impact on people's lives and relationships. Brenda, the author of *Last Tango in Eden Gardens*, focused on how the technology *time transporter* made by Grace's grandson

fulfils a seemingly impossible adventure with friend Daphne. As for Greg, the *intelligent home* of his character John was a comfort and cognitive support, but was used principally as a counterpoint to emphasise how John values doing tasks, helping nature and improving his skills. Val's *helper robots* in *Waste of Space* enabled Zedra and mother to focus on being a family when the robots are not in an "association" meeting, on "strike" or broken.

Two of our four prompts were about pill management but none of the writers made this a central part of their story. When pills were mentioned, they were used to introduce relational issues; the daughter who treats her mother like a child by buying her a pill device after mistakenly taking three lots (*Ripening*); and, the daughter who worried about her mother being depressed after her husband had died, buying a similar device (Ted's story). In each case the story focusses on people's relations rather than details of the technology.

**4.1.1 Technology's Symbolism.** Technology was often used in stories as a symbol to convey an idea, an emotional quality or an aspect of a human relationship. Through Catherine's *Ripening*, we illustrate this symbolism. The *Ripening* is about a feisty woman, Margaret, with a loving amiable husband, Brian, and an overbearing child Alison, who used monitoring technology to compensate for her absence in her parents' life. "*You've already remembered your pills today Mum. Well done!*" [audio feedback from the pill dispenser] "*Well done!*" exploded Margaret. "*I am not a child.*" The *Ripening* depicts a world where advanced driverless cars are already equipped with an entertainment feature in the wind shield [68]. The couple bought a driverless car in secret so as not to be reprimanded or stopped by their daughter. "*They both desperately missed the freedom of their own car and the ability to visit the bush or the beach on a whim. Now their fully automated vehicle would return that joy and spontaneity to their lives.*" Although the couple uses walking sticks, when it comes to driving Margaret missed being in control of the wheel. "*Margaret pulled over a few times to slow her breathing and calm her nerves... She may not be driving, but she felt that she was in charge, and the newness of automatic driving and the loss of control were unnerving her.*" The couple encountered the windscreen entertainment feature accidentally and decided they did not want it as they preferred looking at the seascape, "...Brian pushed one button too many and suddenly their windscreen was filled with muscled medieval warriors brandishing futuristic weapons.. *I think I've found the inflight entertainment... Do you want to play "Warriors to the Death" while we travel?*" After figuring out how to turn off the entertainment system, later the car put the couple in a dangerous situation at a cliff edge



when it wouldn't turn off and they were forced to take turns continuously applying the brake:

*"Is it trying to kill us? Warriors to the Death?"*

*'I hope not, because it would win. Where's the driver's manual?'*...

*'There's no hard copy. It's only digital. I'll get it on my phone...' [She realised she left hers.] I don't suppose you brought your phone Brian.'*

*'No. I never do. I meant to check you had yours before we left.'*"

The couple's nature of relying upon each other and the tendency to forget got the better of them. The dependability of technology is only as good as its battery life and the owner remembering to bring it along. The couple tried many attempts to stop the car, but in the end Margaret said, *"we can't look up the manual. Or maybe we can using the car's computer, but I don't know how. One of us can't go and look for help, because the other one couldn't hold the brake down... you could try to jump clear, but that's only a maybe, and that's not good enough."* [Brian replied] *'Live together, die together?'*" The couple felt hopeless and defeated, and as they decided to let go of the brake to meet their fate together, the car moved to the edge but then stopped. They let out a big sigh of relief but were angry at the anxiety the car caused them, *"...I'm not even going home in it [car]. I want reliable transport. I'm walking."* *'You poor darling. If only our legs were reliable.'* Margaret and Brian walked back hand in hand with walking sticks to look for coffee.

The technologies in this story are symbols. The pill management device manifests both the care and control of the daughter. In the initial workshop, after viewing a pill device infomercial, Jenny had commented *"I think the device is probably alright... but the ad is really... condescending..."* A similar sentiment had been aired after watching the speculative video prompt Uninvited Guests [66]. Then, Jenny commented, *"It's the taking away of the choice. You could say, 'Here's a fork dad that will help you.' and he doesn't get a chance to say, 'No I don't want to use that, I don't need it.' Their daughters... are imposing this technology, because it's making THEM feel better."* Similarly, Ted said, *"...I would read it as the family abrogating their responsibility by using the technology."*

The driverless car in the story was both a form of defiance of their overbearing daughter and at the same time a symbol of regaining the freedom lost when they were deemed incapable of driving. Older people are used to being in-charge and once other people try to make life decisions for them they feel condescended to. They are willing recipients of new technologies that they presume have value but may struggle to keep up with their ever changing features and functionalities. Catherine put it simply, *"Older people want their lives to be easier with*

*technology but want to retain the way of life that is familiar to them."* It's a challenge of fully embracing the new while retaining and anchoring to the old.

The writers express technology as a symbol of allure and charisma [4], e.g. buying a driverless car, while at the same time positioning the forces and politics [76] that come with it as hampering freedom. The driverless car is also a symbol of a technology that fails. When the body 'fails' through for example, declining mobility or eyesight, technologies such as the driverless car are held up as solutions to compensate. Yet, when the technology fails who compensates? The writer laments *"If only our legs were reliable."* The writers artfully reveal how technology becomes enmeshed in human relationships, envisaging both how technologies will impact human relationships and how relationships will respond to new technologies.

## 4.2 From "Maintaining Independence" to Choosing Adventure

The stories portray forces that steer the characters, be it their living situation, ageing body or their relations (daughter, husband or friends). Technologies also exert agency over older people's lives, as illustrated through the driverless car, the pill management device or everyday objects that monitor. The writers eloquently navigated their characters through a world in which these different forces both support and at the same time erode independence. The reader can sense the energy of the characters, weaved throughout the stories, from Judith's character who imagined skiing to Catherine's who took an adventure ride. The fictions expressed a palpable personal message of desire for adventure.

### 4.2.1 Fearlessness of the Known and the Unknown Troubles.

The writers created characters that are fearless with some measure of a fatalistic worldview believing events are predetermined and therefore unavoidable. We see this adventurous spirit and fearlessness in Brenda's *Last Tango in Eden Gardens*: *"Oh delicious irony. While the others are watching chocolate biscuits roll down a conveyor belt, we'll be transported back to the roaring twenties."* Brenda wrote about Grace, a rebellious resident of a nursing home, narrating a tension between Grace and the home director Mrs. Bittern, *"Lookout, it's Bitter and Twisted. She's heading straight for us and she looks angry."* Grace responds to Mrs. Bittern's aggression towards her by fighting back. The hostile relationship between Grace and the director was fuelled when her perfume, a gift from her grandson Todd, was stolen, *"...she did steal my Number Five and she even has the gall to wear it here... She might think I'm too old to wear perfume but my grandson [Todd] obviously didn't."* As a



student, Todd had invented a time travel transporter and was confident enough to have his grandmother and her friend try it, “Well, I wouldn't exactly call my Gran a guinea pig... I wouldn't involve my Gran if it was unsafe...”, he declared. Having tried the machine once, Grace with her best friend Daphne, still wants to travel to the 1920s even after encountering problems the last time, “I hope you have organised the timing a bit better Todd. Last time we landed in the tenth century and that battle scene was intense, not to say dangerous.” In the end, without hesitation the ladies went under the machine, “Todd unwound a telescopic wand capped by a shower head the size of a dinner plate. When it had reached head height he pressed the start button. Multi-coloured sparks sputtered from the spigot and soon became a deluge. It streamed down like an endless rainbow... As the droplets cascaded onto their head and shoulders their images began to blur. When their bodies had disappeared the horror hit Todd. The cable lay untouched on the floor. ‘Shit. It's the restoration plug.’” Todd tried to resolve the glitch but failed. And with that, the story ended. What happened to Grace and Daphne or even Todd, author Brenda, left hanging.

Brenda created the strong-willed character, Grace, in a living situation that is not ideal but that she is able to manage – she both lives with the situation and openly resists at the same time. Grace knows the consequences of defying the director but still stands her ground. Knowing very well the possibility and consequences of a malfunction, Grace without any doubt decides to time travel again. She was willing to risk it all to escape for even a moment her current situation. The characters are not afraid of whatever troubles life throws at them as long as they have the liberty to decide for themselves.

#### 4.3 From Utopia and Dystopia to Social and Moral Dilemmas

None of the writers represented a dystopian or utopian future; instead they created a world where they put the characters at the precipice, literally or figuratively, thereby creating social and moral dilemmas. Catherine's characters choosing between life and death, Ted's between mourning in isolation or living one's life with others or Jenny's between living in a new advanced world or going back to her old world. Each story's conflict gave the characters the choice of which path to take, with human nature and spirit prevailing. The resolution of the story is of course at the hands of the author, wrapped with their own convictions and beliefs, as reflected during the group discussion. “I wouldn't like that world. I would want to come back.” Winnie declared of the world in which devices in the home and inside the body could monitor everything. We illustrate the theme of social and moral

dilemmas highlighting the irony of an imperfect world through Jenny's The Earth Dilemma.

**4.3.1 Irony of an Imperfect World.** “Liberty aligned her fork with its finishing position and noted that she had consumed 690.36 kilo joules, 140 mg sodium, 300mg potassium, 7g sugar and 8g protein. She was rewarded with a smiley face. A ding from her health monitor wrist band registered that her blood pressure was rising. ‘Here we go,’ she muttered to herself. When her mobile rang she knew it would be her daughter...” Jenny's story is about Liberty, an elderly woman struggling between two worlds in a time where Earth's occupants have the choice to relocate to a new “Earth”, a world where technology harmoniously envelops society to the very core of their living with laugh monitors, toilet health analysers and so on, where human bodies are healthier, and where environments and objects are smarter and more efficient. The chasm that divides these two worlds is a *timeway* in the form of a station. For Liberty it's about being with her daughter on Earth 2 or her son on Earth, “You know you're so much better off here. Have you forgotten that you had a stroke there? ”

‘I know but... I want to see Billy. I hate the thought of leaving him there.’ When on Earth 2, Liberty can speak well, is very mobile and even owns a dependable driverless car that “...parked itself in the station carpark. She liked the independence it gave her, it didn't matter how old you were or how bad your reflexes... She did miss her little Honda Jazz, though, being in control, being able to go faster than forty km an hour.” The convenience that technology provides seems to be something that Libby appreciates but cannot fully embrace. At the *timeway* station, her case officer Janine can't understand her hesitation about Earth 2, “What is it that makes you want to go back?”. She replied, ‘Oh you know, life, living, ups and downs, making mistakes and learning from them. Stuff you're too young to appreciate Janine.’

It is apparent that what makes Libby happy is her old imperfect world where even though she limps, struggles to talk and has many other inconveniences, it is her world, “She hailed a taxi and remembering her speech problem, she fished in her bag for the card with her address on it.... [Upon reaching home she sat on her favourite recliner.] It didn't register her weight and tell her she had gained a kilo or that her bone density needed checking. It was soft and comfy and ergonomically inappropriate and she loved it.” The story ends with Libby having tea with her neighbour and eating their favourite chocolate biscuit.

Jenny, the author, was inspired by the Uninvited Guests video, but gave her character agency especially on her life choices, “I just felt so sorry for him... that he just wanted to eat the bad food... and that lack of choice... if he falls over and dies of a heart attack, that's his choice.”

Like the character's name, older adults want the liberty to choose how to live their life – to do what's important to them and what makes them happy. Julie pointed out, *"I'd think 'Hang on, this is ridiculous. Go overseas solo! You might suddenly... have a heart attack... Well, if I'm gonna have a heart attack and die over there, so be it!'"* Technological advancements of more data and speed, more convenience and "comfort" and more efficiency in every aspect of life do not entice everyone. These older people wrote of living their life on their own terms even with compromises, most not expecting to have everything so long as they get to choose how they want to live and are not dictated to by other people or technology; even if that decision leads them to imperfect or even dangerous situations.

The writers in our project imagined futures that were neither strictly dystopian nor utopian. Design fiction commonly depicts diegetic prototypes in perfect functioning condition creating a utopian image or narrative [13,17,34,77]. Or, dystopian futures are imagined with ever so efficient diegetic prototypes that the characters find ways to defy or live with [38,49,77]. The older creative writers, in contrast, created worlds where their characters' liberty and agency is challenged in many ways, with the stories revealing how they cope.

## 5 DISCUSSION

In this section we reflect on monitoring and tracking technology from the older authors' perspectives; and the opportunities and tensions that we navigated when using the *co-design fiction* approach.

### 5.1 Reflections on the Panopticon effect of design trends for older adults

The findings identified a prevailing narrative about how characters assert their choice in the face of external forces. This brings to mind Michel Foucault's metaphor [30] of Jeremy Bentham's literal panopticon prison and system design [6]. Panopticon is a system of control where a single watchman observes a group of people thus regulating their behaviour according to what is acceptable to the watchman. The system functions as a power over mind mechanism with the idea that being monitored at all times compels people to behave according to the rules and norms [30]. This may be an extreme analogy of tracking and monitoring technology, but elements of it are at play in how older people respond to similar systems. The older author's narratives tell us it is important to think in a "precautionary way" and not to engage lightly with

technologies that monitor, track and intrude on privacy, especially in intimate and personal environments [64].

**5.1.1 Dealing with the Invisible Power.** Medication management devices or emergency care pendants serve a purpose, but when these devices operate at the behest of other users such as family members and health care providers, they have a form of power over the older adult that can be likened to the enveloping *invisible* power of the "watchman" [6] hovering over. Our authors did not create complete dystopias, but their characters did encounter external forces (the daughters, nursing home director and the smart devices and environment). The authors illustrated the importance of their characters breaking free from invisible forces, defying an ever consuming force of control and monitoring by others, such they went for adventures no matter how new or dangerous. When the trend to support independent living of older adults falls under the IoT paradigm of tracking and monitoring [1,50,55] this suggests that designers need to consider not only the purpose of the technology but also the invisible force that the technology may create around the older adult. Design cannot solely consider one angle of the agency the technology gives, but must investigate the agency that technologies warrant others.

**5.1.2 The "Watchman" is Not the Only Solution.** Although monitoring technologies aim to support independent living [33,39,75], the subjects of monitoring may find that their liberty, freedom and choice is slowly eroded. Systems that promise physiological and cognitive health may in turn break the human spirit and emotional wellbeing. Our older authors resisted, with their characters drawing upon their relationships to enhance their spirits and emotions. They willingly put their physical health in jeopardy to retain the right to make their own choices. Light points out that there are more efforts on monitoring health than fostering overall wellbeing [41]. Similarly Soro et al call to bridge the perspectives of monitoring and wellbeing by "fostering social engagement and reciprocal care, building on self-fulfilment and individual values" [62,p.2]. The stories showcased that these older adults want travel, coffee and sharing a chocolate biscuit with a loved one, little things that lift their spirit and morale. Support need not always equate to ensuring safety, but rather focus on caring relationships, home comforts and retaining agency.

**5.1.3 Pushing for Balance in Technology Adoption.** In the workshop discussion about their overall reactions to the prompts, Julie encapsulated her feelings stating, *"I don't know how much longer I've got but I want to find a balance*

*in my life. I want to be comfortable. I'm resisting technology. I only want to take on what I can use, that sits in my lifestyle.*" The stories *Ripening* and *The Earth Dilemma* described characters that found balance in the world they loved. The couple in the *Ripening* uses a walking stick and mobile phone as part of their everyday, just as Liberty of the *The Earth Dilemma* uses cards to compensate for her slurred speech. These older adults find balance on their own terms in how they live their lives, maintain their homes and enact their daily routines [15,32,48]. When an outside force disrupts the balance, they adjust their lifestyle to cater to or reject the change so they can continue living the way they are used to. The subtle or "cunning" defiance of the characters reflects their push for balance in technology adoption.

Overall, the literary works lack design details of diegetic prototypes but we emphasize that in asking the creative writers to write about futures we felt there was much to be learned to inform design. This is akin to the way in which ethnography opens up the play of possibilities for design. The outputs may also be materials to speculate requirements and implications of technology's possible future adoption [47]. Rather than going straight to diegetic prototypes these fictions weave relationships and circumstances around the design.

## 5.2 Co-Design Fiction Opportunities and Tensions

In this section, we discuss the inherent opportunities and tensions in using the *co-design fiction* approach.

**5.2.1 Personal Narrative in Envisioned Future.** Researchers may shy away from creating fictions that demand unfamiliar skills such as sketching [12,77], making or building [49] or writing narrative design fiction [9]. Although Blythe encourages researchers to equip themselves with knowledge on storytelling and plot [9], showing how future narratives are a powerful tool in design [10], it is also argued that much design fiction is researcher-led or "scientific" [11] indicating that it is worth exploring new vantage points on design fiction.

We present a new approach to design fiction by involving 'others' [42], potential users themselves, who are familiar with the creative process. Amateur creative writers have passion and expertise in written narrative craft, character building, plot etc and are found in many local community classes. In a medium and method such as design fiction where narrative is its strength, bringing forward the user's personal narrative is invaluable in the process. Their personal beliefs, culture and convictions are naturally enmeshed in the narrative they create [10,37] or

write [24,61]. Although researchers create or write their own design fictions, the narrative voice of potential users offers a new perspective. Experienced creators such as writers or passionate readers in a certain demographic or domain already have the skills to explore writing design fiction, as well as knowledge about their demographic or domain. In the design community, working with experts such as artists [44], engineers and craftspeople [56], and other specialisations of participants is common practice; as they represent expertise other than their craft, and are the sole expert of their own life. Older adults have years of lived experiences, social encounters and accumulated wisdom [25,43,53] that make them invaluable members of *co-design fiction* workshops to explore futures for older adults. Participants enmesh their own worldview into the narrative of their design fictions. Together with their life experiences, the characteristics of creative writers [24,61] of being observant, constantly curious, having vivid imagination and the ability to translate their created worlds, characters and stories into written form are a potent combination for writing design fiction.

**5.2.2 The Reach and Limit of the Research Team.** While *co-design fiction* participants bring in their creative skills such as writing expertise together with their life experiences, beliefs and culture, the research team brings in prompts and facilitates a discussion about what design fictions are to be written about. We prepared prompts/provocations about tracking and monitoring technologies, but needed to find out whether this was something the older authors were interested to engage in and to figure out how we might collectively go about it. When Blythe (2017) was tasked to write a design fiction about digital immortality, he asked for more details to put more context to the topic that would lead him to writing a story. He was given links to articles and forums as well as an episode of a TV show that served as prompts to spark his imagination [9]. Similarly, in our study of exploring tracking and monitoring technology trends for older people [54,55,62], we deliberately chose prompts in the form of images and videos with a variety of narratives to draw the writers into a space where we hoped to spark their creativity. The choice of using a relatable design fiction (The Uninvited Guests speculative video) also provided our participants a general feel of what design fiction is in its final form. The prompts easily sparked conversation beyond the technology to social and personal issues of ageing themes that were also reflected in their literary outputs.

When the space or subject matter to be written about is abstract, concrete prompts help writers to start generating ideas that later help to build their fiction. In projects such as FabPod [2], the actual space in question served as the prompt itself. When there is no concrete representation of the subject to be written about, it is critical to choose an inspirational, engrossing and relatable set of prompts that inspire the creative process and broadly suit the aim of the *co-design fiction* work.

One of the major tensions in co-design fiction work is balancing the freedom and creativity of the participants with the researchers' desire to guide the design investigation. In one group we felt we tried to justify our research goals too much, which may have been interpreted as leading too much. We reflected upon and discussed how much our role affected the outcomes. In the second group, we went more directly to discussion of the prompts, which we felt the participants would find interesting. This led to a long discussion through which the writers realized that we were open to creative interpretations and tangents, and that we preferred that control be relinquished by us and taken by the participants themselves. The authors' plots were very varied and none made medication management central to their story even though two prompts focused on this. It thus appeared that a variety of prompts and a good discussion achieved the balance that we sought.

**5.2.3 Working with Creative Freedom.** One of the key tensions in co-design fiction relates to the topic of the fiction itself and parameters defining the process. Design fiction aims to explore and critique possible futures, which possibly raises the question of who controls the narrative in co-design fiction. Our approach was to discuss and agree on possible topics with participant creative writers and to look for inspiring prompts. Beyond that we defer to the writers, in the spirit of not curtailing any creative freedom. How the prompts are absorbed and translated into their outputs, and in what timeframe, are left up to the writers. In our study, several authors made direct use of the prompts in some form in their design fictions although typically they were not central to their stories. e.g. Ted's use of both a pill device and messaging kettle and Judith's hope of new ways to connect with family members. Five of the participating writers pushed their fictions further by having diegetic prototypes in their story, while two envisioned a story of future life using existing technology. Two were emotionally tugged by the process such that they decided to express their thoughts and feelings not in fiction but in an essay and a poem.

A concern of the writers was whether they should include a futuristic technology in their story. We wanted the writers to focus on their strength of telling stories bringing in their backgrounds and experiences to deliver a story that resonates with a takeaway message. Understanding the creative process and how each writer has their own writing style [24,61], we simply emphasised that they write a story based on the prompts and discussions. Working with design students, Markussen and Knutz had them create design fictions in accordance with their skills as graphic designers, illustrators and interaction designers. Highlighting the narrative power [18,23,73] of design fiction, rather than solely focussing on an object that exists in a future context, i.e. a diegetic prototype [7], we gave the authors the creative freedom to decide about technology in their story. We wanted to avoid curtailing their creativity and having them worry about whether they were creating the right kind of story. We wanted them to write a story that was right for them. Thus, two of our participants instead delivered their message through a poem and an essay. These two literary outputs encapsulated similar messages to those of the design fictions. We believe that prioritising creative freedom was beneficial. We were able to gather diverse literary outputs (including two nonfiction works) with varying kinds of futures that were neither utopian nor dystopian, but that represented the older authors' imaginings about futures.

The common narratives of design fiction futures convey a utopian stance of perfectly working technology where everyone is happy as depicted in imaginary catalogues [17], scenarios [34], future services in posters [13] or company vision videos, which are "overly seductive" [10]. Dystopian futures, on the other hand, are commonly depicted in movies but also in research especially in literary work and design fiction [38,49,51,57]. This is possibly the case because design fiction in research is used to critique technology focussed futures. Given creative freedom and not being members of the research community, our older adult creative writers mostly focused on social and moral dilemmas which revealed aspects of the human spirit; friendship, adventure, resilience and the desire for control.

In our *co-design fiction*, the creative writers specifically requested not to write the stories in groups as they have different writing styles and a different creative stance on similar prompts. Additionally, they wanted to write their stories in different time frames. Ted and Greg preferred to write within the workshop time, whereas Val's group

wanted a week to write their story. They wanted time to find the “bubble” and to take time to engage in and reflect on their work [61]. We were pleased to honour these requests as it reflected their commitment to the project. The time that they took reflected in the quality of their work. Greg, a novice writer who opted to write on the fly, wrote a story more akin to a scenario [73] but it still showed interesting aspects of an independent older adult living in the future.

The women authors expressed their wish to be recognised together with their works. Initially anonymized during the submission of this paper, we processed a variation of our ethical clearance agreement in order to acknowledge the creative writing group. This was approved by the committee and signed by the participants in time for the publication of this paper.

## 6 CONCLUSION

We contribute *co-design fiction*, an approach which engages end-users to express their imaginings about life and technology in the future through design fiction works, inspired by their beliefs, culture and convictions. Co-design fiction (a) involves participants in defining the approach, creating the fiction and reflecting on the outputs, (b) acknowledges and reconciles different creative processes of participants and (c) balances the author’s need for creative freedom with the researcher’s desire to guide the design investigation at hand.

We investigated the approach by conducting co-design fiction workshops with nine amateur older creative writers to speculate on tracking and monitoring technology trends for older people. Their stories revealed older adults’ desire for adventure, rather than simply “maintaining independence”. A dominant theme was the irony of the choice between safety and compliance vs the risk of fearlessly choosing happiness and taking control. The stories revealed that the older authors are wary of tracking and monitoring technologies as a solution for independence; and that they turn to social relations and small comforts as a source of strength and enjoyment, resisting controlling or complicated technologies that upset their balance, a critical insight to guide the design of technologies.

Finally, we contribute a discussion of the *co-design fiction* approach, highlighting the importance of prioritizing participants’ creative freedom, negotiation of the topic, and seeking inspiring prompts. Rather than depicting utopian or dystopian futures, as is commonly done by

researchers, we found that instead the older authors focused their stories on social and moral dilemmas in dealing with external forces, (impositions of people, technologies or systems) and the way in which they asserted their choices. They used future technologies in their stories in a symbolic way to reveal their relationships and convictions. Through co-design fiction we benefit from participants’ strength in creating, making or writing as well as their perspectives on life and the domain under investigation. Our analysis shows how *co-design fiction* was able to capture a nuanced and fresh perspective on technology and ageing.

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