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Fig. 1. Example images and props from original Cyberpunk 2085 project which inspired and is extended by SciberPunk. Digital art by Jon Lautala

In this case study we describe the evolution of a new method for creating future personas, called SciberPunks, for use in sustainable city design scenarios. SciberPunks channel the voice of the environment and have special abilities for feeling and expressing data, such as the ability to taste it, or communicate it through living tattoos on the skin. The aim was to examine how environmental data could act as a bridge between people and nature, to encourage empathy towards 'more-than-human' perspectives. We engaged 5 participants in activities designed to lead them through a process of engaging with information and data in the process of building their personas. The activities utilised arts-based methods as we were interested in the experiential aspects of engaging with data and how we might foster creative and sensory experiences with it. Activities included drawing, writing and performing and were framed by a single story that took participants on a journey through time: past, present and future. Activities took place online, due to COVID-19. Overall, participants produced 5 characters, including a shaman, a shape-shifter and a fairy, all with special skills for connecting to nature and/or to each other.

CCS Concepts: • **Human-centered computing** → **Participatory design**.

Additional Key Words and Phrases: arts-based methods, datasets, online, co-design, environment, sustainability, data literacy, covid-19

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1 INTRODUCTION

In 2019 an abstract within an alt.chi paper asked what would happen if, in the future, it became common to augment children to 'feel' local environmental data as a seventh sense that connected them intimately to environmental concerns. How might this seventh sense develop alongside their other senses and be useful in participatory design, giving the environment a voice in such a process? [10] While AugKids are likely science fiction there are already examples of adults choosing to augment themselves, such as the example of Moon Ribas, a self-described modern day cyborg who 'feels' live earthquake data through augmentation and expresses this through dance [11]. These examples inspire the main idea of the work described in this case study paper, namely that in the absence of real augmentation, the process of developing 'future personas' that represent beings - who can directly experience data - may be one route to building environmental empathy and in turn, this might have a place in 'more-than-human' design practice. In this paper, we describe the first stage of this work, namely the developing and testing of arts-based methods for developing future personas using existing data and other resources as a starting point.

2 MOTIVATION AND RELATED WORK

Urbanisation is leading to a loss of green space and natural habitat within cities making it harder for people to directly experience and connect with nature. Children are especially likely to miss out on nature activities due to fears for safety when playing out without supervision [26]. Lack of experiencing nature in childhood can lead to apathy and even biophobia towards environmental concerns which can have a negative impact on sustainable decision-making in adulthood [22]. Less directly, it may lead to 'baseline' shift, where people fail to notice and speak out against incremental change in the loss of green space, as they remember it as normal [15]. To combat this, emerging design philosophies such as more-than-human design [13] propose to consciously foreground the environment and it's non-human inhabitants in design processes to ensure that they are not forgotten. How to put this into practice is not yet clear, especially how such methods could be used to change the minds of those who are already becoming 'blind' to nature. This requires more than just simply presenting information in the hope to change people's minds [5], but instead to build or rebuild empathy towards nature [1]. This work explores one approach for building empathy through indirect interactions mediated by environmental data, to either supplement direct experiences or for use when these are not possible.

2.1 Arts-based methods in research and design

Arts-based methods are methods that are based on a specific form of art and can be classified as: **Visual art**: still images, photography, drawing, collage, painting, graffiti; **Moving images**: video, digital animation. 3D artefacts: e.g. quilts, mosaics, masks, life-size marionettes; **Performing art**: theatre/drama, dance, music, puppetry. **Live art**: writing on the body; **Literary art**: poetry, creative writing, reader's theatre; **Multiple methods approach**: i.e. combining different art genres [14]. These different methods have been used within research to achieve a wide range of effects, such as to foster new ideas and engage with problems through multiple senses. In particular, they are often used for their effectiveness in building empathy [6, 19, 28, 30, 32]. In one example, Clarke et al. [13] utilised an embodied drama approach to enact an urban walk to support more-than-human design perspectives and understanding of relationships between different urban species. This requires that

participants use their imagination to put themselves into the role of non-human actors. Our method offers a possible extension to this approach, by **utilising real data sets to support imagination** of such other views to create a method that can be used when direct access to the environment is not possible and to include the environment itself as a non-human actor in a design process. To this end, we also draw on principles of narrative supported data sensemaking [3, 4, 12], empathy building through data [9, 16, 24, 33] and data literacy techniques [36] to curate real data for use in this work.

2.2 Personas

In SciberPunk, we aim to utilise both arts-based methods and storytelling and narrative techniques to structure empathic experiences around data in the process of defining characteristics of new **future personas**. The concept of a persona originated from Cooper [17] as a way of giving designers a more concrete reference point from which to make design decisions. Personas are a fictional user archetype that typically give a 'name and face' to a type of user or a product or service, describe their important characteristics, expectations, motivations and typical frustrations. Methods for creating personas include direct access (e.g. observation, focus groups with consumers) and indirect access methods [7], such as using expert knowledge of a system and its users, often combined with insights gained from analyzing different sources of data [27], including ethnographic data, market research, clickstream analytics and social media data [2, 23]. The majority of personas are intended to represent typical users of a product, but there are some exceptions, which include future personas [20], fantasy personas [25], and animal personas [21]. We build on these less traditional ideas of personas in developing our SciberPunk concept.

3 SCIBERPUNK CONCEPT: BUILDING ON CYBERPUNK 2085

Sciberpunk extends an existing arts project, called Cyberpunk 2085 which started in 2019. It was conceived by Jon Lautala and undertaken by Theatrum Olga (drama in education student theatre) which is led by Lasse Kantola. Cyberpunk is often associated with an environmental disaster or climate change, tracking or chipping people and cyber attacks and hacking, for example. The project collaboratively produced a series of sketches, props, photographs and videos that brought this concept to life (for one example of data curation, see fig. 1).

The starting point for SciberPunk was to extend this original concept by imagining a future where humans are augmented to experience nature 'directly' through physical augmentations linked to environmental datasets. Then to consider how this experience would manifest, for example through feelings/actions/physical changes of the SciberPunk and its adapted body, with particular emphasis on how real data can form a basis for identifying trends and making predictions for the future. Essentially, SciberPunk is a future persona that experiences data as a seventh sense. It does not yet exist, but the question it allows us to ask is, if such a SciberPunk did exist with all these senses, then how might this change our relationship to the world around us? The initial stages of SciberPunk project, described here in this paper, focused around developing a a set of activities to support creating SciberPunks. Later activities will explore how the created personas could be integrated into real design activities.

4 DESIGNING THE SCIBERPUNK ACTIVITY SERIES

We identified 5 stages for creating and evaluating SciberPunk characters. These were:
S1 Framing: Familiarising to project goals, obtaining consent, pre-questionnaires, building trust.
S2 Data Sensemaking: Exploring data and related information, identifying worrying or hopeful trends.
S3 Embodiment and Communication of Data: Experiencing multiple perspectives on data and

imagining how it feels to experience it directly and linking it to place.
S4 Prototypes: Designing a SciberPunk.
S5 Group Evaluation: Presenting characters and reflecting on the process.

We designed a set of activities to support each stage. We had two topics for creating SciberPunks 1) a local nature area, called *Linnaistensuo* (a swamp area) 2) COVID-19, which was prompted by the ongoing crisis situation and which presented an opportunity to explore how SciberPunks could help build connections between people as well as nature. We collected data and other information about both of these topics and curated this information, using data literacy techniques [4, 36] to make it easier to access (fig. 2).

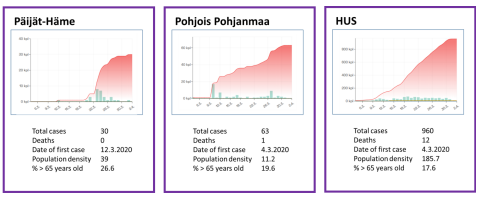

Fig. 2. Cards for reading local COVID-19 data

Next we designed arts-based activities to support making sense of the data. Representative examples include: **A1: Manifesto**. Create an artistic manifesto about Linnaistensuo **A2: Impressions-on-the-wall**. Explore inner and outer feelings of being in Linnaistensuo using a outline of yourself on large sheet of paper **A3: Montage**. Select images, sounds and words which are juxtaposed to evoke feelings and thoughts while being in your favorite place in nature. Work as a team combining your skills. **A4: Create Suomuijat (*swamp*) character**. Use drama techniques, ROLE, SITUATION, TENSION to help understand them. **A5: Roleplay.** Play the role of the character with another person. **A7: Communicate character.** Using any preferred medium (words, poetry, music)

We originally planned to run 5 face to face workshops to collaboratively undertake these activities. Due to COVID-19, participants instead worked individually in their own home and communications occurred either synchronously (via Zoom) or asynchronously (via WhatsApp and email). It was not possible to schedule long Zoom sessions, therefore instead of being led by a facilitator, the data, information and arts-based activities were presented via *workbooks* created using Google forms, which participants could work through at their convenience. Zoom was for gathering all participants together at one time around a key topic. WhatsApp was used for general chat, sharing activity outputs and community building. As well as providing access to information and data sets, the workbooks also asked for reflections from the participants related to the activities, which they submitted through the form. The majority of activities were left flexible, so that participants could complete them using items they had to hand and also personal preference and skill for different forms of expressions, e.g. through narrative, poetry, sketching. However, to ensure that the experience was *inclusive and equitable* for all a materials pack was delivered to participants including arts materials, an instamax camera and, based on the nature theme, some packs of seeds for growing. One final change that we implemented based on the asynchronous way of working and as a way to improve the overall coherence was to introduce an overarching narrative – based on pre-text process drama [29] - to effectively bind all the different activities into one.

4.1 SciberPunk narrative: a journey through time

The first key aspect of this narrative was that it introduced a temporal element that *led participants on a journey through time*, starting in the past and utilising the original environmental data about Linnaistensuo, then moving to the present day (utilising coronavirus data) and finally projecting into the future. Effectively, participants were cycling through stages 2 (sensemaking) and 3 (embodiment and communication) twice, in order to include the COVID information. The framing (S1) and group

Table 1. SciberCity activities

Narrative Phase	Past	Present	Future
Narrative summary	Suomuijat characters are living in Linnaistensuo swamp area where they encounter three characters, Shadow, Light and Raven Etiäinen and help them to understand each other and to make sense of the world.	Suomuijat have moved to the city and are experiencing the start of COVID-19. People stay inside and get information and statistics from news articles. Raven invites them to predict the future, based on data. Will it be Dystopian or Utopian future?	Suomuijat meet a new character 'Hope Qualia' who has a seventh sense through augmentation to experience data. She asks the Suomuijat about their own adaptations – what new senses do they have and how could they be used, or even mis-used?
Workshop stages	Sensemaking (S2) Embodiment & Communication (S3)	Sensemaking (S2) Embodiment & Communication (S3)	Prototyping (S4)
Main activity summaries	Participants explored Linnaistensuo data and information, then used a combination of *visual and literary* art techniques to capture the feeling of being there, using activities such as writing a manifesto, or making a soundscape. Participants brought to life their own Suomuijat character, using a combination of *visual, literary and performing* art techniques to describe and then play the role of their character.	Participants read news articles about COVID-19 and looked at curated cards of local covid data, playing some guessing games on the statistics. They were then asked to create a comic strip for Dystopian/Utopian futures, thinking about what future the characters may come to inhabit.	Participants were prompted to think about augmentations for their characters, using a set of 'ability' cards presented as a starting point. They created new abilities for own characters, completing new sketches with the help of objects found in the nearby environment and also communicating about characters through writing and poetry.

evaluation (S5) took place mainly via Zoom, supported by documents sent through email and posted on the WhatsApp group, through which medium the participants also had the opportunities for asking questions at any stage.

The narrative followed a tribe call 'Suomuijat' (swamp dwellers) who started life in nature but over time moved to live in cities and then eventually would evolve into SciberPunk characters, able to commune directly with nature but utilising data via augmentations to give them extra senses or 'super powers'. Participant activities were all focused towards imagining and fleshing out these characters, with their own characteristics, ideas and personalities. A brief summary of activities in relation to different narrative and workshop stages can be found in Table 1.

The narrative utilised three further characters, *Raven Etiäinen, Shadow* and *Light*, whose role was to provide a context for looking at information and taking part in activities. The following presents fragments of the opening narrative and shows how it segues into the first activity...

"Our journey begins in the heart of Linnaistensuo, where Shadow and Light are born from the swamp.... One day, a big black raven called Etiäinen is flying towards them landing on their shoulders asking: Do you know about the future, can you please tell me what will the future look like? For the first time in their entire life, Shadow and Light are arguing. They cannot agree about the future... Raven Etiäinen decides to help them, advising them to see what evidence they can find to support their arguments.... Take a look at what they found...."

5 RESULTS AND IMPLICATIONS

Five youth education students from Theatrum Olga agreed to take part in the SciberPunk project. One participant was the creator of the original Cyberpunk 2085 project. This was a much reduced number than would have participated in the face to face workshops but enough to still yield rich, qualitative data to guide the next stages of designing new methods for more-than-human co-design scenarios. We present here the findings and main insights gained from SciberPunk, related to 1) assessing the impact of the online move 2) empathy building 3) engagement with persona building activities 4) SciberPunk persona outputs. In each case, we outline the evaluation strategy that was used and draw out the key lessons learned.

5.1 Assessing the impact of the online move

To understand how online practices affected the outcomes, a researcher not originally involved with the research interviewed the co-design facilitators. The interviews took place at a midpoint of the project, on 27th April. They were then transcribed and analyzed with thematic analysis [8]. Codes were created inductively, informed by themes and literature related to the research question. We found seven central themes around the concepts of co-designing, facilitating, and building empathy online. We summarize them as follows. Main themes that emerged in the analysis are highlighted in bold and concepts related to each theme are italicized. We include selected quotes for illustration.

Video is flat; drama is physical. The normal methods of facilitation did not work and co-creation did not happen synchronously. *Synchronous online interaction was more serious* and video calls were more similar to Q&A sessions and status checks, rather than interactive co-creation workshops. Due to this, there is a *need for novel methods that can enable online playfulness.* The calls should have *artefacts to facilitate discussion.*

Asynchronous communication enabled peer to peer interaction and sharing. The role of a chat channel that supported uploading videos, images, and sound was a major factor in *building a community*, more so than initially anticipated. Unlike during video calls, chat channel allowed more flexible peer to peer interaction. Most of the *sharing and peer to peer discussion occurred in chat* that enabled rapport-building, chatter, and fun interactions.

Despite the challenges, **co-creation occurred,** with a major enabling factor being *a successful mix of asynchronous and synchronous interaction*, and the **participants were engaged** with the activities. Participants shared most through asynchronous methods (group chat) and synchronous methods (video calls) got participants' full attention and ensured that everyone was one the same page.

Co-creation was different. Instead of working together, participants tended to *work independently to a certain degree and then share.* Sharing was also different: Instead of performing directly to others, *participants created, photographed and then described the context* (see Figure 3 for example outputs shared to WhatsAPP). The most experienced art-based facilitator in the group described the shared artefacts as a lot more cognitive and thoughtful, rather than playful. This closed some opportunities and enabled others. For example, a senior participant told how corn seeds can be

planted from popcorn packages. Several participants tried this and then documented online how the plants grew.

Fig. 3. Outputs of SciberPunk Activities from first narrative phase

"So it has been a surprise to me this, how much they share about a kind of an emotional thing about nature. So there's a lot of these beautiful images and they seem to be important to them to share with each other." — Facilitator A

Online activities are less intense, but **longer in duration** and **required more preparation in advance**. This enabled more solo activity opportunities, such as thinking about and working with data, and participants were able to set their own pace when working. They were able to review the material other participants shared at leisure, build on these, and share their own. The activities were less immediately interactive, but there were more opportunities to share, time-wise.

"...also, he shared that he has also started to put some tomatoes and cucumbers. That's kind of a thing that I wouldn't have necessarily designed. So those, those kind of things has worked quite well." — Facilitator A

Disconnect between drama, narrative, and activities. Unlike physical theatre locations, chat and video calls are not naturally conductive for drama activities and do not automatically set participants in the required mood. Additionally, participants used several tools in a sequence, such as photographing to chat and then using survey forms to facilitate solo activities, where there wasn't always a natural flow between one activity to next. Therefore, *activities require a lot of signposting* and *participants require reminders of how all activities fit in together,* since the facilitator is not physically co-located with the participants and can't lead the activities through their person, for example by acting or showing an example.

Due to the disconnect, more challenging synchronous co-creation, and long-term duration, the following needs and adaptations were found to be essential. **Online participants need more advice, prompting, and support** and **online implementations require more structuring**. Essentially, the activities need *more scripting* and *artefacts that guide participants from one step to another*. When co-creating and drama interactivity is required, this automatic guidance created by the facilitators would help participants prepare for co-creation and set them in the right mood. Due to the need for more guidance, when *working online the participant roles needed to be more clear and less dynamic*. The most experienced facilitator in the group observed that in offline facilitation, they were normally able to make the experience more dynamic and also let participants lead.

5.2 Empathy

To understand and evaluate the process of using art-based methods for empathy-building, we planned to conduct attitude assessments before and after the activities. We were both interested in evaluating the empathy with nature with the questionnaire of Dispositional empathy with nature DENS [35] and at a more general level to assess empathy with the Interpersonal Reactivity Index (IRI) by Davis [18] who defines empathy as the "reactions of one individual to the observed

experiences of another". Due to the online move and low participant numbers we could not use this approach this time, but we propose it here as as an assessment approach that could be useful in understanding how to apply art-based methods for empathy-building in future scenarios. Instead, on this occasion, we aimed to understand empathy via the application of deductive thematic analysis [8] on the answers the participant wrote down in their worksheets during the S2 to S4 workshop activities. The thematic codes were informed by empathy constructs [34, 35], and basic emotions as defined by Plutchik [31] (anger, fear, sadness, disgust, surprise, anticipation, acceptance, joy). Additionally, we analyzed any relevant nature-related sentiments that occurred in the responses.

Past narrative phase themes (S2, S3). The main themes the participants expressed when reflecting on the past of the Linnaistensuo region were *joy* about pure nature, *sadness* tinged with wistfulness, and *empathy* in the sense of wondering what it was like before human activities changed the region. However, many responses were moderated by *acceptance* of the change that had occurred.

Present narrative phase themes (S2, S3). The main themes related to the present and the Covid-19 crisis were *fear* about what will happen, *sadness* for the suffering of loved ones, *disgust* about the careless practises that allowed the consequences, and *anticipation* for a better future.

Future narrative phase themes (S4). The main themes expressed in future were divided along a line of *anticipation* for potential of things to be better, but on the other hand *disgust* for people who were going to cause damage. Some responses expressed *anger*, in the sense that they wanted to disrupt existing practises. When imagining future personas, different concepts and future abilities included the following *empathy* -related concepts: Wanting to be able to sense others' needs and emotions or be more *connected*, having precognition to be able to *guard nature from danger*, and being able to *sense when nature is in pain.*

5.3 Engagement with persona building activities

The participants had all been added onto the WhatsApp group by 24th March. By 17th June, a total of 1138 messages (854 text and 284 picture or video) were posted in the group. To understand how participants were engaging with the SciberPunk activities we looked for evidence from the WhatsAPP chat channel. All messages between these dates were thematically analysed [8] by one author and checked by another (taking 60 messages for a random sample with Cohen's kappa for IRR 0.63, or substantial agreement). In total 9 themes were identified, listed below with total number of occurrences in brackets and one example in quotes:

(1) General conversation without discernible theme (182) *"This friend of my dog is so weird. He has now stopped walking and is playing artificially dead when he should go out"*
(2) Reacting (e.g. with emoticon) to someone's post (210) *"Good idea!"*
(3) A miscellaneous posting e.g a meme or inspirational quote (10) *"Did I send you this one, have a look, she makes me soooo happy"*
(4) Housekeeping, such as sharing or clarifying instructions. (176) *"Hello, the first survey to be completed can be found behind the link <link omitted>"*
(5) Introductions between participants (38) *"Hello. I'm <name omitted>, a student. I do yoga and climb"*
(6) Art related pictures and conversation (78) *"Really strange and touching. <name omitted> had painted a black portrait and forged the frames"*
(7) Nature related pictures and conversation (148) *"Changing places and inspiration .. Wonderful nature giving"*
(8) Discussions about growing seeds (53) *"Now I put the sunflower seeds and peas in the pot! How wonderful!"*

(9) Sciberpunk activities and outputs. (210) *"I thought so that the raven is not death and that light and shadow follow?"*

What is striking is that over half of the conversation could be classified according to the nature or arts theme, even though it was still part of general conversation unrelated to SciberPunk activities. It was also interesting that participants enjoyed sharing their own efforts in growing plants from seeds.

5.4 SciberPunks

Finally, we present the five SciberPunk characters (figure 4).that were produced at the end of the activities, using the words that the participants used to describe them:

(1) **Warmonk** is a shaman character who communicates with plants and trees using his staff that he built using the old world technology. The staff keeps his mind and body connected to nature.
(2) **Swamp fairy** has a crown to listen to what nature is whispering. With that comes her unique power to actually listen and do what she is saying she will do and turn words into action.
(3) **Super woman** belongs to Suomuijat tribe and is interested in understanding the human mind. She can transform into a tree and can teleport herself from place to place - she's all over the place. With the headband she can read peoples minds and forecast the future, at least some part of it.
(4) **Power Granny** is a very small character who belongs to Suomuijat tribe and is interested in berries. Has a butterfly sensor which senses emotions and reacts with flashing red light when there is a lot of negative or not constructive feelings and golden light when there is positive feelings. Can also analyze very fast if something is false news, manipulation or provocation.
(5) **Cloudberry** is able to get data from all the plants in the nature as well as the food you are going to eat and that you've eaten during the day. She knows which plants are edible and what they're good for. She also invented a ring so that everyone could get this kind of super power.

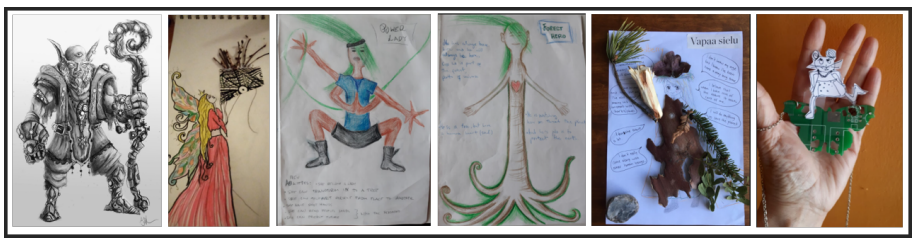

Fig. 4. Characters who have evolved from Suomuijat to SciberPunks

Overall, these outputs suggest that the workshop activities achieved the aim of leading towards creation of personas that were, at a minimum, *informed* by real data sets, yet were atypical in terms of representing 'more-than-human' characters. In addition, the type of data utilised was not typical user data but information (and some small amount of data) about the environment and data and information about the current COVID-19 situation. What is interesting to note about these personas is that they all have strong connections to nature, yet such instructions were not given directly as part of the activities. Participants understood the overall aim of the project in terms of creating methods to support building environmental empathy but were not introduced to more typical personas, the processes of building them or how their own characters may differ. This *nature*

theme seemed to emerge naturally from the narrative context, the data and information presented through activities, the interactions of participants with each other and with the activities. Yet, it was still surprising given that participants worked predominantly in isolation. It is also apparent that these new Sciber characters were *quite different than the original Cyberpunk project ones, and that rather than being augmented with technology were just as likely to have evolved with new innate abilities such as telepathy.*

6 LIMITATIONS AND FUTURE WORK

We recognise several limitations to our case study. First, the online nature limited our ability to capture data and also significantly reduced the number of participants who took part. This has impacted on our ability to conduct any quantitative analysis of data collected via questionnaire or to draw conclusion from responses given. Nor could we be confident in understanding the link between the different activities, the information and data and the creation of SciberPunk characters, though we have done our best to make these links by following the conversations and by looking at the reflections and produced artefacts in relation to what was happening in the project at the time. It is also the case that the participants we did have seemed already quite connected to nature though they live in a city, whereas it would be nice to test the approach with people who are less able to visit green spaces. Whilst we must be cautious with our findings, we do believe there is potential in our approach for developing future personas as SciberPunks that could be used in a design process. We suggest a use for such characters, such as asking in relation to a given design problem 'what would Cloudberry think about this proposed solution for this green space?' 'How would Warmonk react to the idea of making a green roof on the bus shelter?' In order to extend the approach we would need further testing and validation especially in terms of the use of real-data sets and predictions made on these. We would need to extend the process in order to incorporate additional information based on a design task, for example hopes/fears/frustrations of the character in relation to the design scenario. *While our initial design and testing of activities was agnostic to a specific design problem our recommendation is that activities for creating personas are streamlined and adapted to each context and that the activities are used in a pre-generative phases of a co-design.*

7 CONCLUSIONS

The importance of this case study to the CHI community is in demonstrating how conversations about nature and environmental concerns can be developed, utilsing an arts-based approach combined with real data. This has potential to be extended and formalised into a co-design method especially for urban design scenarios as a way to provide an environmental voice to the process through the eyes of SciberPunk future personas. We provide some recommendations on how to conduct these, or similar, activities successfully online as well as insight into which aspects are less successful in this setting. Despite the challenges, we have demonstrated through our case study that even for people who are sitting in their homes due to COVID, our approach can instigate conversations related to nature and arts and our activities yield evidence of foregrounding empathy towards nature.

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