

NightMarebles: Doze away at night and day

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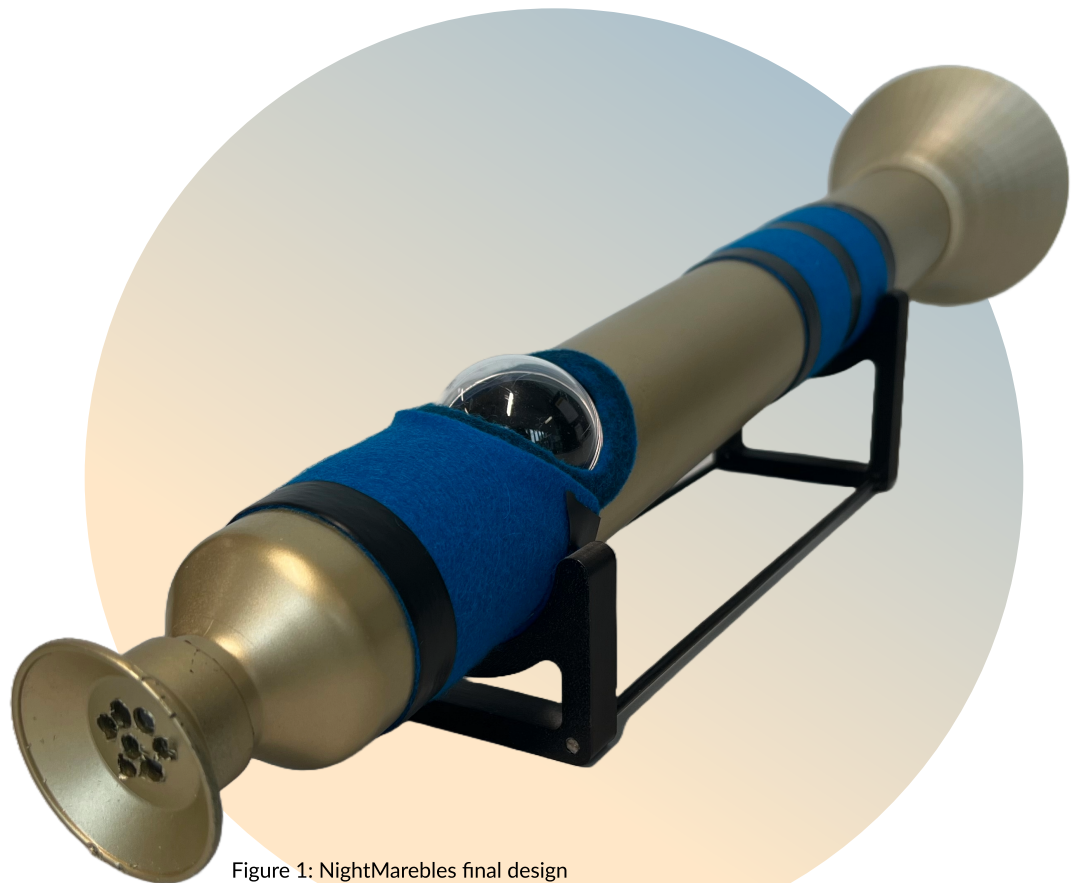


Figure 1: NightMarebles final design

Introduction and Positioning

Central to the process has been the notion of designing aesthetics of interaction, involving beauty and expressivity in using. Aesthetic interaction is therein seen an experienced, practical, social, and tangible interaction, as well as creating meaning, inherently emotional, interpreted, and a communicator of concepts [1, 2, 3, 4]. These concepts together form the premises the described process is built upon, making one that is not user-centered but one of the aesthetics of interaction. This results in prototypes much less technologically founded, but rather focussed on the core of its expressed meaning.

Designing for interaction means considering the importance of the human body, which can be utilized to better communicate the meaning of the design [2, 5, 6]. Designing large motions, physical experiences, and embodied communication increases expressivity and emotion. The effects of such interaction can be theoretically analyzed, for which this pictorial used the Frogger Framework, to specifically target all elements of interaction and its relative affordances [7, 8]. Depending on the goal of the design affordances, feedback, and feedforward can be used to invite or inhibit certain interaction with the design.



Figure 2: NightMarebles marbles in jar at nightstand



Figure 3: Tyga van Overschot using NightMarebles

Design Process

Originally, we designed for the extreme character of a child without parents with whom they could share their dreams as an ideation method inspired by Djajadiningrat et al. [9]. The method served our creative mindset not only in designing for this character, but also in selecting among interesting characters such as a hen without rooster, or Jezus. Process-wise, we realized after design critique it would have been beneficial to explore interactions beforehand.



Figure 4: Ideation for extreme character

This exploration was influenced by a variation on the method of Interaction Relabelling [9]. The group created designs exploring sound, playing and plucking as a means to emotionally determine time; metaphorically grinding away parts of the day; physical embodiment of time including hoisting and hanging; hugging and warmth; hidden affordances [16]; and the behavior and effects of light throughout the day. These explorations were then interacted with without prior explanation and instead explained by a non-maker, which led to the labeling of various unintended interactions.



Figure 5: Broader ideation



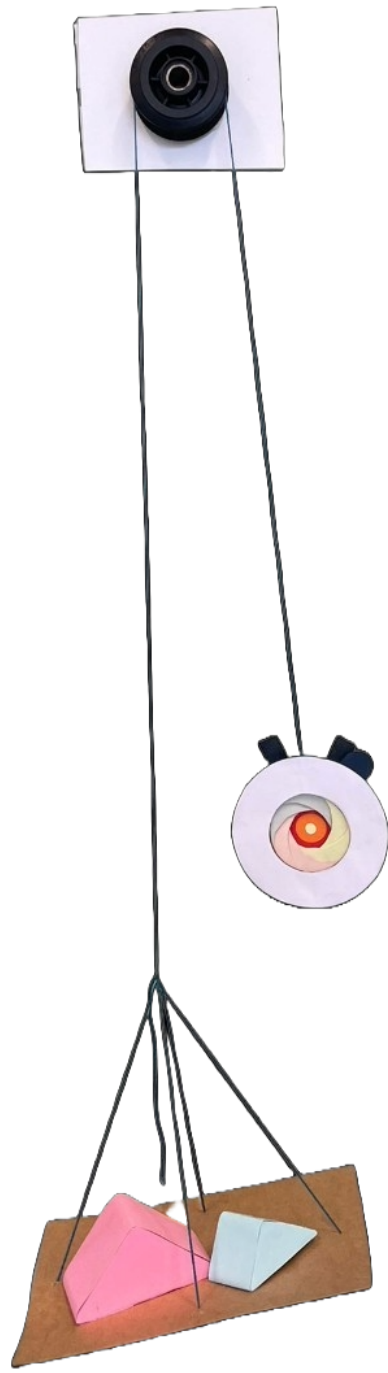


Figure 6: Prototype on tangible time and change of light

After evaluating and selecting recurring themes and concepts, we followed on with a more detailed experience prototype that reflected the physical embodiment of time, personalization (inspired by YoYo-machines [10]), and the change of light during the day.

The prototype (figure 6) conceptualizes a light slowly rising and changing during the night as well as day, that also reflects pragmatic scientific advantages for sleep [1, 11, 12]. Time is embodied with weight on a plate, changing the path of the light.

Prototype (figure 7) can be personalized through colored light discs changing light in the environment.

Design critique on these prototypes helped realize these prototypes were only partly experienceable, which could have been substituted by storytelling, wizarding of Oz [14], or plain explanation. In addition, the devices only stand out from commercially available alarm clocks through their tangible time aspect. While the used concepts show potential, it was clear there are stronger ways to make these concepts experienceable, and more aesthetically interactive (as opposed to user-centered) ways to display a wake-up experience.



Figure 7: Prototype focused on personalization

To achieve these goals, the group partially started over and reconsidered various elements of the concept and design. A new prototype took inspiration from the first iteration, and interpreted the design brief in a more open and creative manner as a method aiming to create original design.

The prototype (figure 8) only reacts when a user wakes from a nightmare, after which it calms them down to better fall asleep again by showing a pleasant visual representation of the dream. The prototype was a reactive, caring, and personal waking experience showing much more creative potential with an even simpler physicalization of concept.

From there, evaluation, ideation and iteration led to changes including the addition of sound to further calm the user, the use of marbles and blowing them away instead of watching the dream change (partly inspired by the Big Friendly Giant [13]), and the addition of lights to guide the user. These changes made dreams more tangible, the experience more expressive, reactive and in touch with emotions, and the device more caring as a whole. Thus, the experienceability, pragmatism, and richness of interaction have improved as we learned to consider valuable in aesthetic interaction design [1, 2, 3]. In addition, the technological workings of the prototype were simplified, leading to an increased focus on the concept.



Figure 8: The first prototype that led directly to the final design



Figure 9: Geert Hansma experiencing the prototype

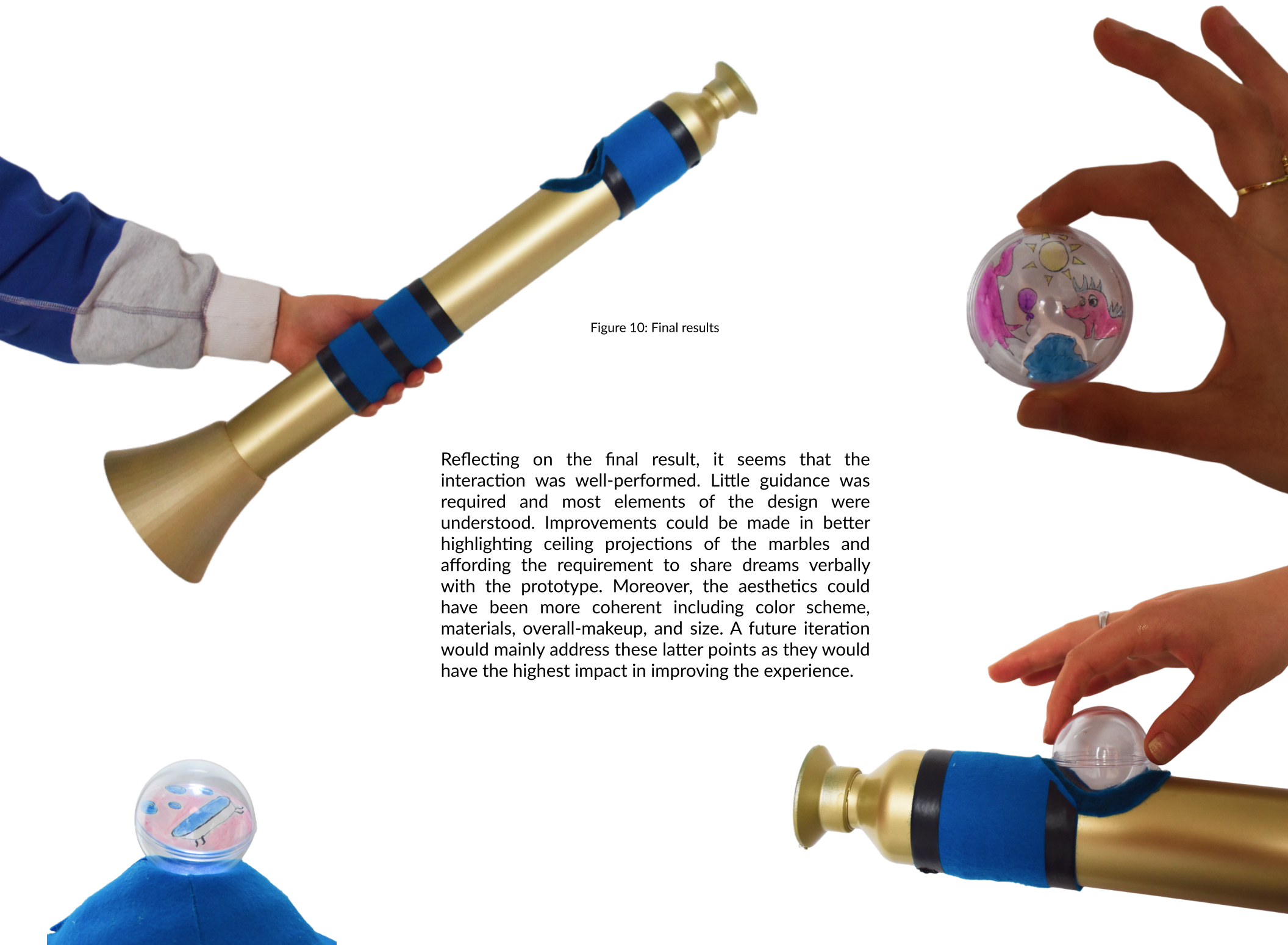


Figure 10: Final results

Reflecting on the final result, it seems that the interaction was well-performed. Little guidance was required and most elements of the design were understood. Improvements could be made in better highlighting ceiling projections of the marbles and affording the requirement to share dreams verbally with the prototype. Moreover, the aesthetics could have been more coherent including color scheme, materials, overall-makeup, and size. A future iteration would mainly address these latter points as they would have the highest impact in improving the experience.

Perspective on Aesthetics of Interaction

Central to the process has been the transition from user-centered design to creative aesthetic interaction design. My thinking shifted towards guiding experience, interaction, expressivity, and emotion. These factors are inherently subjective, which can be used for interpretable design - seemingly a must for beauty - but also to design in such a way that a specific meaning, perspective, or action is either inhibited or invited [8]. Some products (e.g. appliances) may benefit from such invited or afforded action, while design for beauty and aesthetics is more likely to aim for subjective experience and may even invite users to create their own meaning [2].

I view Aesthetics of Interaction as a method that aims to take control of these factors by considering the desired experience of design. It relates closely to phenomenology as it aims to direct the meaning users discover through their interaction towards a particular goal. Again, that goal may be strengthening or weakening intersubjectivity in experience and meaning, or designing strong inherent affordances to invite certain interaction [8, 15].

References

All unreferenced images have been created by me or another member of the team: Geert Hansma, Nour Kamel, Sophie van Malland, and Tyga van Overschot. Generative AI has not been used in the writing of this report, but it has been used to create images of dreams displayed in figure 4, 8, and 9.

1. Philip Ross and Stephan Wensveen. 2010. Designing aesthetics of behavior in interaction: Using aesthetic experience as a mechanism for design. *International Journal of Design*, 4(2), 3-13. <http://www.ijdesign.org/index.php/IJDesign/article/viewFile/765/294>
2. Caroline Hummels, Kees Overbeeke, and Sietske Klooster. 2007. Move to get moved: a search for methods, tools and knowledge to design for expressive and rich movement-based interaction. *Personal Ubiquitous Computing* 11(8), 677-690. DOI: <http://dx.doi.org/10.1007/s00779-006-0135-y>
3. Tom Djajadiningrat, Kees Overbeeke, and Stephan Wensveen. 2000. Augmenting fun and beauty: a pamphlet. In *Proceedings of DARE 2000 on Designing augmented reality environments (DARE '00)*. ACM, New York, NY, USA, 131-134. DOI: <http://dx.doi.org/10.1145/354666.354680>
4. Marion Buchenau and Jane Fulton Suri. 2000. Experience prototyping. In *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (DIS '00)*, Daniel Boyarski and Wendy A. Kellogg (Eds.). ACM, New York, NY, USA, 424-433. DOI: <http://dx.doi.org/10.1145/347642.347802>
5. Dorothé Smit, Doenja Oogjes, Bruna Goveia da Rocha, Ambra Trotto, Yeup Hur, and Caroline Hummels. 2016. Ideating in Skills: Developing Tools for Embodied Co-Design. In *Proceedings of the TEI '16: Tenth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '16)*. Association for Computing Machinery, New York, NY, USA, 78-85. <https://doi.org/10.1145/2839462.2839497>
6. Vasiliki Tsaknaki, Madeline Balaam, Anna Ståhl, Pedro Sanches, Charles Windlin, Pavel Karpashevich, and Kristina Höök. 2019. Teaching Soma Design. In *Proceedings of the 2019 on Designing Interactive Systems Conference (DIS '19)*. Association for Computing Machinery, New York, NY, USA, 1237-1249. <https://doi.org/10.1145/3322276.3322327>

7. Victor Kaptelinin. Affordances. The Encyclopedia of Human-Computer Interaction, 2nd Ed. <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/affordances>
8. Stephan Wensveen, Tom Djajadiningrat, and Kees Overbeeke. 2004. Interaction frogger: a design framework to couple action and function through feedback and feedforward. In Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques (DIS '04). ACM, New York, NY, USA, 177-184. DOI: <http://dx.doi.org/10.1145/1013115.1013140>
9. Tom Djajadiningrat, Bill Gaver, and Joep Frens. 2000. Interaction relabeling and extreme characters: methods for exploring aesthetic interactions. In Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (DIS '00), Daniel Boyarski and Wendy A. Kellogg (Eds.). ACM, New York, NY, USA, 66-71. DOI: <http://dx.doi.org/10.1145/347642.347664>
10. William Gaver, Andy Boucher, Dean Brown, David Chatting, Naho Matsuda, Liliana Ovalle, Andy Sheen, and Michail Vanis. 2022. Yo-Yo Machines: Self-Build Devices that Support Social Connections During the Pandemic. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22). Association for Computing Machinery, New York, NY, USA, Article 458, 1-17. <https://doi.org/10.1145/3491102.3517547>
11. Joshua Gooley, Kyle Chamberlain, Kurt Smith, Sat Bir Khalsa, Shantha Rajaratnam, Eliza van Reen, Jamie Zeitzer, Charles Czeisler, and Steven Lockley. 2011. Exposure to Room Light before Bedtime Suppresses Melatonin Onset and Shortens Melatonin During in Humans. The Journal of Clinical Endocrinology & Metabolism, 96(3), 463-472. <https://doi.org/10.1210/jc.2010-2098>
12. Rachel Leproult, Egidio Colecchia, Mireille L'Hermite-Balériaux, and Eve Van Cauter. Transition from Dim to Bright Light in the Morning Induces an Immediate Elevation of Cortisol Levels. The Journal of Clinical Endocrinology & Metabolism, 86(1), 151-157. <https://doi.org/10.1210/jcem.86.1.7102>
13. Roald Dahl. 2007. The BFG. Puffin Books, London, UK.
14. David Malsby, Saul Greenberg, and Richard Mander. 1993. Prototyping an intelligent agent through Wizard of Oz. In Proceedings of the INTERACT '93 and CHI '93 Conference on Human Factors in Computing Systems (CHI '93). Association for Computing Machinery, New York, NY, USA, 277-284. <https://doi.org/10.1145/169059.169215>
15. Thomas Scheff. 2006. Concepts and concept formation: Goffman and beyond. Qualitative Sociology Review, 2(3), 48-64. <https://doi.org/10.18778/1733-8077.2.3.04>
16. Marianne Graves Petersen, Majken Kirkegaard Rasmussen, and Johan Tretvik. 2020. Affordances of Shape-Changing Interfaces: An Information Perspective on Transformability and Movement. In Proceedings of the 2020 ACM Designing Interactive Systems Conference (DIS '20). Association for Computing Machinery, New York, NY, USA, 1959-1971. <https://doi.org/10.1145/3357236.3395521>