

Fungal Symbiosis

Humans and fungi are related. Take mycelium, it is the underground fungal network that connects plants and trees with each other. It is often referred to as the wood wide web, because mycelium plays an important role in plant communication and survival. The mycelium works in a similar way as the human brain, it sends electronic pulses throughout the network (Schwartzberg, 2019). Besides communication, it is also used by trees to send nutrition to other trees. Mycelium keeps forests alive by decomposing plant matter (Dart, n.d.). But there is a problem, the fear of fungi (called Mycophobia) is most common among humans. Which is strange because humans originate from fungi and surely use fungi to survive. Fungi plays an essential role for humans, for example in medicine and food production (Dart, n.d.). Not only that, but humans are also more related to fungi than any other kingdom (Jones, 2009). Mycophobia is a part of the largest and most fundamental problem that humans will ever face, the fact that we are destroying the planet. This shows how disconnected we are from nature. Nature has fought back against humans in a number of ways, but humans always find a way to continue on their destructive behaviour. Nature needs humans to drastically change their ways. Although this is something that can't be forced on us and needs to come from intrinsic values, it is something within reach. We just need the right motivation, by understanding ourselves and our fundamental inherent connection to nature. Now it is time to show humans a way to live in symbiosis with all of nature. How can humans repair their connection with nature? By showing humans where they've come from. For that we need both knowledge and empathy. Humans usually automatically show empathy towards certain parts of nature like cute animals and children. So, how come that most humans display an almost sociopathic behaviour towards other parts of nature, like destroying forests? These are mostly the parts of nature that are less understood, like mycelium for example. Finding a way to repair the connection between humans and nature will lead to understanding, empathy and respect in humans. And this will create a more healthy, balanced and connected world. A possible cause of us being so out of touch of our origins, is because we have developed a sense of ego, and with that the tendency to distance ourself from nature. Believing that we are something more than nature, because we have an advanced form of intelligence, consciousness, ego and culture isn't right. We should strive to be more in touch with where we came from and what we are. What advantages does being in touch with nature have? I have found obvious, but also unexpected advantages. For example being in nature reduces anger, fear, and stress and increases pleasant feelings (Delagran, n.d.). Besides, it contributes to your physical wellbeing, reducing blood pressure, heart rate, muscle tension, and the production of stress hormones. Humans crave a sense of belonging and wanting to be part of something larger (F. Stephan Mayer, 2009). Nature is the obvious solution here. What came as a surprise to me is that, this sense of not belonging most likely comes from being detached with nature. Its only logical that humans have started asking existential questions about the meaning of life, because we have been stripped away from where we came from; nature. *I believe that the only way to save humans and the planet is to get a better connection to nature.* This leads me to my research question; *how can mycelium be used to repair our broken connection with nature?* We should work with technology, science and empathy to make this happen.



Virtual view, project by D.Roberts based on A.R.T.



Project by Beer van Geer where the participant sees their breath visualized on the ground to help meditate.

The goal of Fungal Symbiosis is for humans to reconnect with nature in the form of a meditation. By doing so, humans will be taken out of their daily lives and have the mental space and clarity to better reflect about their habits and mental constructs. Nature is proven to heal in many ways, as is also researched in the Attention Restoration Theory (A.R.T.) (Ackerman, 2018). Danielle Roberts has done an interesting project based on A.R.T. where a view of nature adapts to the biometric data from the user. (Roberts, n.d.) This provided inspiration for my prototype. A.R.T. argues that people can restore their attention and concentration by being in nature or even looking at nature images. The theory proposes four components that characterize such a restorative environment (Ackerman, 2018):

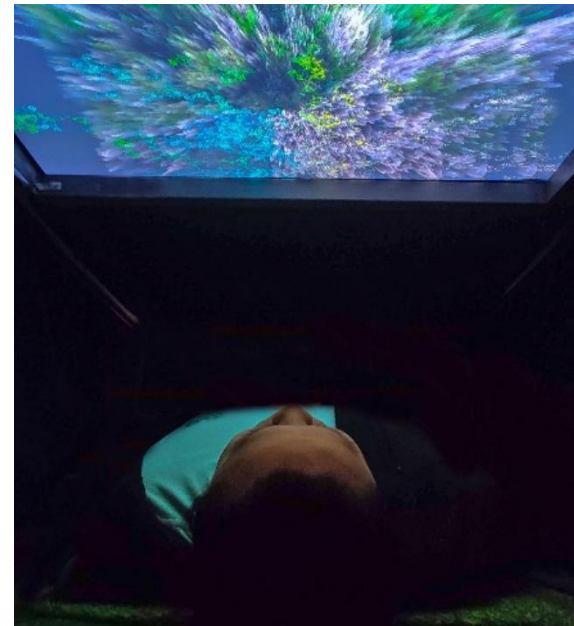
Being Away from one's usual thoughts and concerns: this is achieved by the prototype being at a foreign place and inside a sheltered tent. This should feel like a safe place where one doesn't feel like they are being watched.

Soft Fascination by holding one's attention without effort. This will be achieved by the visualization of the participants breathing. The participant only has to look at the screen and be in the moment.

Extent, meaning that the restorative environment should be a place where one can be comfortable and at ease. This will be triggered by the connection with nature. The inside of the tent will be decorated with natural feeling components so that it feels like a natural environment. This includes touch and smell sensations of grass, moss, leaves, tree bark and dirt. Furthermore, calming nature sounds will play in the background.

Compatibility means that the participant needs to be in a place because of their own intrinsic motivation. By explaining the goal of the experience and the possible benefits the participants should find some part of it that intrigues them. The installation will visualize the participant's biometric data so that he/she can become aware of the state of their body. This visualization is in the form of a mycelial network that grows and has a breath that responds to the participant.

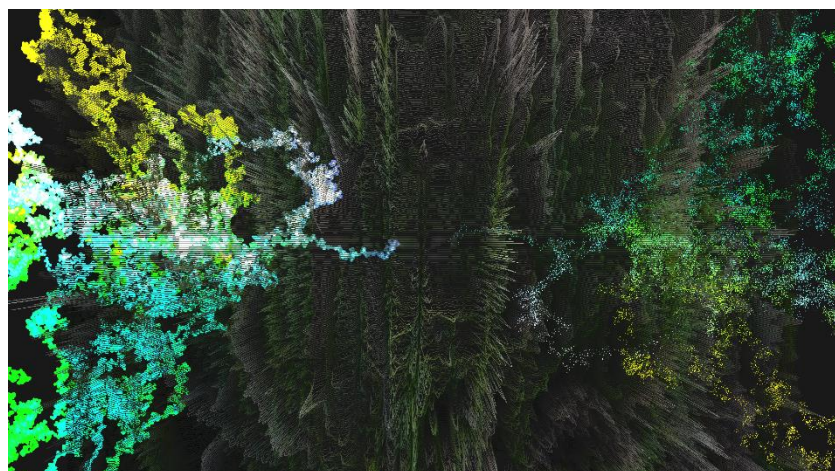
Inspired by a project by Beer van Geer where someone is helped in meditation by a virtual visualisation of the breath (Geer, 2020). Another level of immersive depth can be added by the use of soft robotics. These are soft (usually silicone) actuators that can inflate and deflate. This could for be used to have a deeper interaction with the mycelium, by letting the mycelium control these actuators. The actuators could be located around the chest or arms. This is inspired by the project Symbiosis – Polymorf (Marcel van Brakel, 2020). This project used soft robotics for more immersive storytelling. By using more sensory inputs it's easier to imagine being another creature.



Someone laying inside Fungal Symbiosis and experiencing the meditation



Symbiosis - Polymorf. Interactive storytelling with implemented soft robotics



The visualisation of the growing mycelium. It also has a video overlay of a forest, which further increases the feeling of immersion and the connection with nature.

The purpose of Fungal Symbiosis, is to make the humans more aware of themselves, by giving them the tools to take a step back from their ego and reflect on it. The participants in the meditation experience will be paired up. This should motivate each other to stay focussed on the meditation. The mycelium visualises breathing in and out by expanding and contracting. The variable growth speed, colour and width of the mycelium will be affected by the breathing frequency. Both the participants have to sync their breathing with each other in order to match up those variables. This way you will have an interaction between both of the participants, who are together connecting to nature. It's supposed to start a conversation about our current ways of living, and how we view the world, without forcing any particular view on the participants. Humans should be able to make up their own minds about how to treat nature and themselves justly, they just need a nudge in the right direction, in this case in the form of empathy.

Verwijzingen

Ackerman, C. E. (2018). *What is Kaplan's Attention Restoration Theory (ART)?* Opgehaald van positivepsychology: <https://positivepsychology.com/attention-restoration-theory/>

Dart, C. (sd). *Fungi Are Responsible For Life On Land As We Know It.* Opgehaald van CBC: <https://www.cbc.ca/natureofthings/features/fungi-are-responsible-for-life-on-land-as-we-know-it>

Delagran, L. (sd). *How Does Nature Impact Our Wellbeing?* Opgehaald van takingcharge : <https://www.takingcharge.csh.umn.edu/how-does-nature-impact-our-wellbeing>

F. Stephan Mayer, C. M.-S. (2009). *Why Is Nature Beneficial?The Role ofConnectedness to Nature.* Environment and Behavior.

Geer, B. v. (2020). *ademruimte.* Opgehaald van breathingspaces: <https://www.breathingspaces.eu/>

Jones, L. (2009, November 24). *Mushrooms are more closely related to us than to plants!* Opgehaald van lehighvalleylive: https://www.lehighvalleylive.com/your-mind-on-my-mind/2009/11/mushrooms_are_more_closely_related_to_us_than_to_plants.html

Marcel van Brakel, M. M. (2020). *Symbiosis.* Opgehaald van Polymorf: <https://www.polymorf.nl/interaction/symbiosis/>

Roberts, D. (sd). *Awareness Lab | experiencing the invisible | Virtual View.* Opgehaald van awarenesslab: http://awarenesslab.nl/projects/virtual-view_en.html

Schwartzberg, L. (Regisseur). (2019). *Fantastic Fungi* [Film].