



Delft University of Technology

Document Version

Final published version

Licence

CC BY-NC

Citation (APA)

Vekemans, V. C., Parisi, S., Zeng, F. Z., & Wu, J. (2025). The X_Heal Toolkit: Navigating Temporal and Dynamic Self-Healing Processes in Living Materials. In *International Association of Societies of Design Research Congress 2025: DESIGN NEXT* <https://doi.org/10.21606/iasdr.2025.304>

Important note

To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright

In case the licence states "Dutch Copyright Act (Article 25fa)", this publication was made available Green Open Access via the TU Delft Institutional Repository pursuant to Dutch Copyright Act (Article 25fa, the Taverne amendment). This provision does not affect copyright ownership.
Unless copyright is transferred by contract or statute, it remains with the copyright holder.

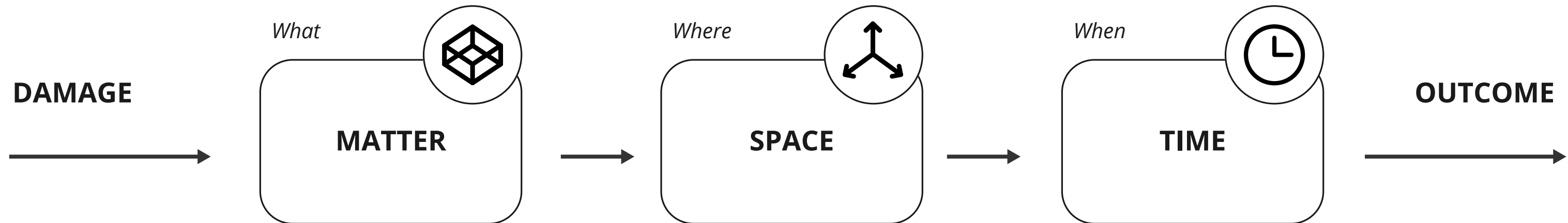
Sharing and reuse

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.

This work is downloaded from Delft University of Technology.



- Type**
- Vertical/horizontal /oblique Crack
 - Side Fracture
 - Closed Hole
 - Open Hole
 - Broken pieces
 - Missing piece

- Form**
- Shape
 - Dimensions
- Tactile**
- Hard
 - Rough
 - Cold
 - Not elastic
 - Strong
 - Light
 - Tough
 - Soft
 - Smooth
 - Warm
 - Elastic
 - Weak
 - Heavy
 - Ductile
- Visual**
- Color
 - Hue - Saturation - Luminance
 - Matte
 - Not reflective
 - Opaque
 - Glossy
 - Reflective
 - Transparent
 - Patterns

- Direction**
- X, Y, Z
 - Up/down
 - Bottom/top
 - Bottom and top
 - All directions

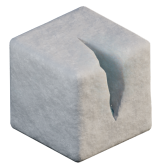
- Speed**
- Breaks/pauses/stops
 - Delays
 - Synchronisation
 - Oscillation
 - Pulse
 - Pace
 - Tempo
 - decrease increase
 - Periods or intervals
 - Frequency
 - Rhythm





**Vertical/horizontal
/oblique Crack**

a vertical/horizontal/oblique line on the surface of something along which it has split without breaking apart.



Side Fracture

a solid body or surface separated on the side.



Closed Hole

a hollow place in a solid body or surface without going through the body or surface.



Open Hole

a hollow place in a solid body or surface that goes through the body or surface.



Broken pieces

separate into pieces.



Missing piece

a broken piece that is not able to be found because it is not in its expected place.

 Breaks/pauses/stops

 Delays

 Synchronisation

 Pace/Tempo *increase*

 Pace/Tempo *decrease*

 Rhythm/Frequency

 Oscillation

 Pulse

 Periods or intervals

 Up/down

 Bottom/top

 Bottom and top

 All directions

Healing process of: _____

Type of Damage:



Time

Start time: _____

End time: _____



Sketch visualization
of the initial stage



Sketch visualization
of in between



Sketch visualization
of the middle stage



Sketch visualization
of in between



Sketch visualization
of the end stage

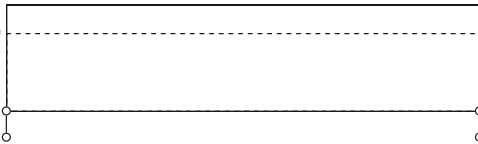
Limit / max: *Big*

Height original form

What is changing:

Dimensions

Limit / min: *Small*



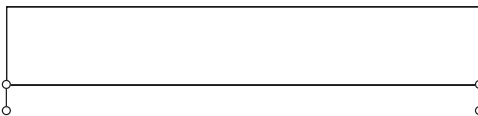
Direction

Outcome: _____

Limit / max: _____

What is changing:

Limit / min: _____



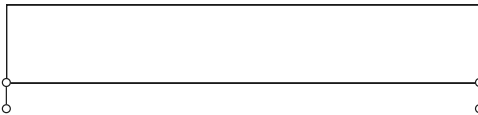
Direction

Outcome: _____

Limit / max: _____

What is changing:

Limit / min: _____



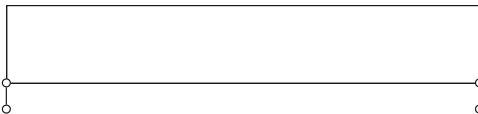
Direction

Outcome: _____

Limit / max: _____

What is changing:

Limit / min: _____



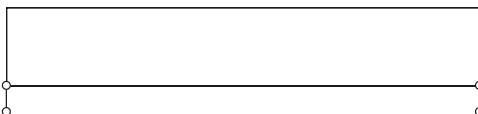
Direction

Outcome: _____

Limit / max: _____

What is changing:

Limit / min: _____



Direction

Outcome: _____

Skin's Wound



Vertical/horizontal
/oblique Crack



Side Fracture



Closed Hole



Open Hole

 Broken piece

Missing piece

Start time: day 0

End time: day 17



Sketch visualization of the initial stage



Sketch visualisation of $\mathbf{I}$ between



Sketch visualization of the middle stage



Sketch visualization of $\mathbf{I}$ between



Sketch visualization of the end stage

