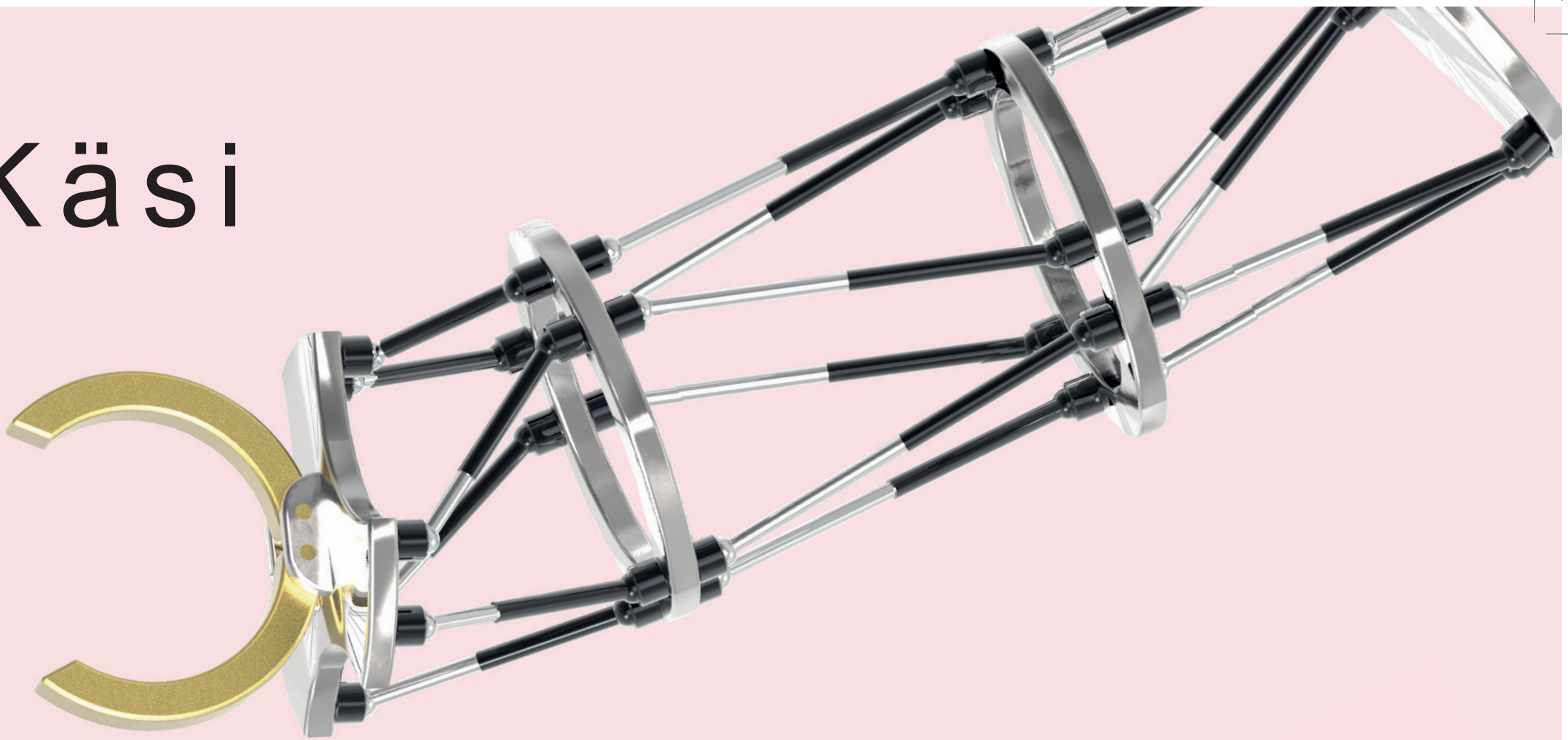


Käsi



Käsi is an answer to 2 guiding questions

1. What basic functionality does the SGP provide?
2. How can these functions be expanded upon?

Phrased differently: We start from the geometrical and kinematic properties that the SGP provides. We let these possibilities and constraints guide what we design instead of starting with the application. In this way we can utilize the SGP to its full potential

To evaluate our design we created 3 main criteria.

1. Could the project be designed without SGP elements i.e. does the SGP introduce unnecessary complexity?
2. Does the design utilize all SGP functionality?
3. Is it useful?

Käsi was the project that best fulfilled these criteria.

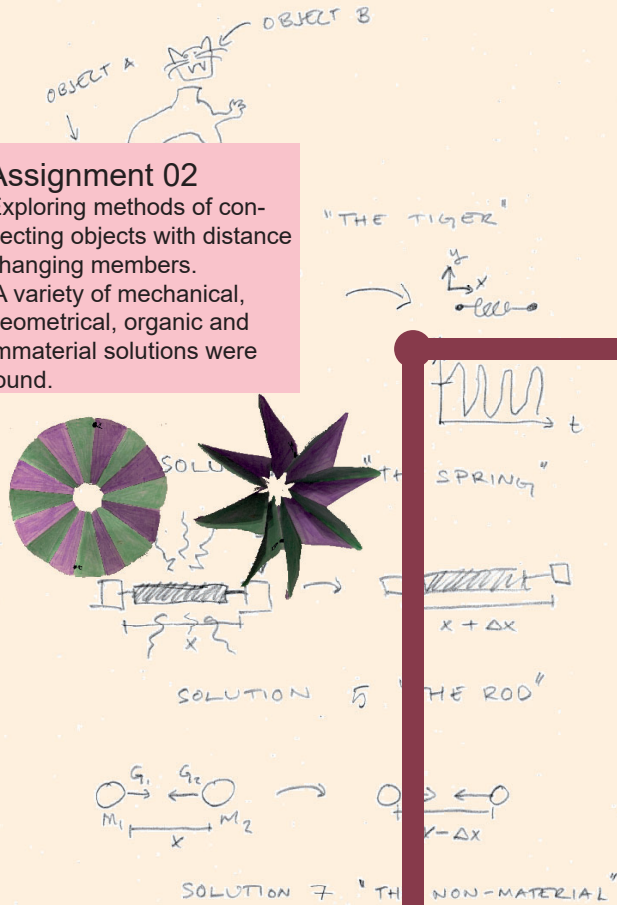
To make an arm that can move around obstacles, approach objects from different angles, retract and extend one necessarily needs a certain degree of complexity. The arm simply multiplies the freedoms provided by one SGP, thereby no functionality is lost.

As to the question of usefulness; From disaster relief, where the robot can move through narrow passages, to handling large and complex objects in an industrial setting, we see a rich landscape of possible uses for Käsi

Assignment 02

Exploring methods of connecting objects with distance changing members.

A variety of mechanical, geometrical, organic and immaterial solutions were found.



START

Assignment 01

An attempt at constraining 2 planes. The minimum found was 3, a solution to a misunderstood set of rules. Introduction to Stewart-Gough Platforms.

Midterm review

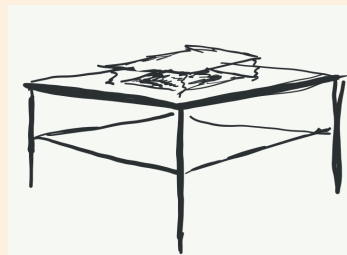
Working on the basis of our previous assignments, we came up with 2 projects to demonstrate applications that built on the kinematics, geometry and actuation methods we examined.

“Luukku”

A Low-Tech Approach to Automated Ventilation Systems

A concept for a roof hatch. Low tech and fully automated. It provides a ventilation solution especially applicable to large commercial facilities.

Based on the actuation methods examined in assignment 02, we settled on springs tensioned by copper cables. As the temperature inside the structure rises, the cables expand and allow the hatch to open.

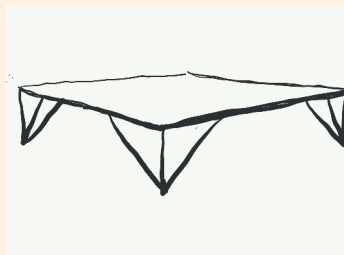


“Ukko”

An Examination of Actuating Legs

Here we expanded on the kinematics of SGPs to create a walking and jumping “creature”. In itself the idea of a walking robot based on linearly actuating legs is not new. Therefore, we put the emphasis on the method of actuation.

Our proposals included: linear motors, hydraulic and pneumatic pistons, cable constrained springs (similar to luukku), thermally expanding substances and explosive actuation.



Feedback

Based on the constructive feedback provided by the panel assembled at our midterm review we had to rethink our understanding of the rules constraining our work.

The project we felt most enthusiastic about “Luukku” did not fulfill the requirement to include the full functionality of the SGP.

Exhibition

Final Design

For our final project we decided to start *tabula rasa*. We wanted to design a system that could take full advantage of the functionality of SGPs and could if further developed be a useful product. After careful deliberation we decided to start working on our final design “Käsi”- Arm/Hand