Challenge name	***PROGRAMMABLE INFLATABLES***
Challenge owners	Roos Meerman & Tom Kortbeek
	www.fillipstudios.com(/pilab)
Experts	Bas van der Linden (TU/e) + Harold Benten (Fontys)
	www.tue.nl/en/research/researchers/bas-van-der-linden
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Brief summary	Join the research program *Programmable Inflatables* of *Pi Lab*: an interdisciplinary laboratory in Eindhoven where designers, scientists and engineers collaborate. You are going to explore new functions and applications of materials, use digital technologies in new explorative ways, and work together with people from other disciplines and institutions. The research of *Programmable Inflatables* is led by design studio Fillip Studios.

About the challenge owners

In 2020 *Fillip Studios* founded *Pi Lab*, an interdisciplinary laboratory hosted together with TU Eindhoven, Fontys Engineering and Design Academy. In this lab scientists, engineers and artists jointly work on new innovative applications for different industries. Currently the researches Aera Fabrica and Adaptable Auxetics are conducted in order to create artworks and innovative applications.

Background Fillip Studios

Fillip Studios is an art and design studio with the mission to create impact through wonder. The studio is founded by artists Roos Meerman and Tom Kortbeek and develops artistic concepts and conducts design research. The studio uses their innovative creativity to turn wonder into impact. Because all progress starts with wonder.

The artistic concepts of *Fillip Studios* are shown all across the world. The design research is conducted by *Fillip Studios* in cooperation with universities, institutions, museums and commercial companies.

Challenge description

Everyone recognizes the magical feeling of watching the dynamics of opening flowers, the passing of the clouds and the changing of the sea from low tide to high tide. However, most of the designed objects directly around us are static. With contemporary technology, such as 3D printing, complex structures and materials can be made that allow us to experience the world differently. Architecture that adapts to the circumstances you need, rooms that can change and disappear. And within the medical sciences; transforming objects that can perform different functions in a body. In Programmable Inflatables, we are going to design objects that can be designed to morph into a target shape upon a Stimulus. You will design a combination of three elements: a Program, a Stimulus, and the Dynamics. In this way the objects receive their properties not from the properties of the base materials, but from their newly designed structures. We are creating new possibilities that have a property that is not found in naturally occurring materials.

We will design concepts that will contain the following aspects:

The program: the way you create or manipulate the designated material(s)

The stimulus: the actuator of the inflatable. Air pressure in combination with for example temperature, moisture, pressure, water (circulation), electricity, magnetism, light, vibration, etc.

The dynamics: how the material(s) changes shape.

Involvement & resources

In this challenge you will work together with students from Design Academy Eindhoven and Fontys Engineering. The challenge owners will be available weekly to update and reflect upon progress. Together with the partners from Design Academy Eindhoven and Fontys Engineering, experts will be invited to show their work and share expertise. The challenge owners can provide specific materials to produce inflatables. They will connect the student to experts in the field and invite these experts to give lectures and reflect upon the work of the students. In consultation TU/e students can make use of materials and machines available in Design Academy and Fontys.