Retractable roofs are roof structures that can transform from configuration to another (typically the open and closed roof) to provide variable cover to the space underneath in response to changing conditions and/or functional requirements.

Retractable roofs that use a membrane as cladding component typically have only one configuration in which they are able to carry loads. In addition, such roofs often require a supporting structure that remains in place over the space underneath, even when the roof is open. For these reasons, the range of applications of this specific category of retractable roofing solutions is limited.

This dissertation is therefore concerned with the development of a system for retractable membrane roofs with more than one stable configuration and a moveable supporting structure.

As a basis for this system, we suggest a structure that consists of a series of membrane strips spanned between several parallel scissor arches. The membrane strips are connected to the hinges of the scissors, using high and low hinges alternatively, so that they fold and unfold together with the supporting structure in a wave-like pattern.