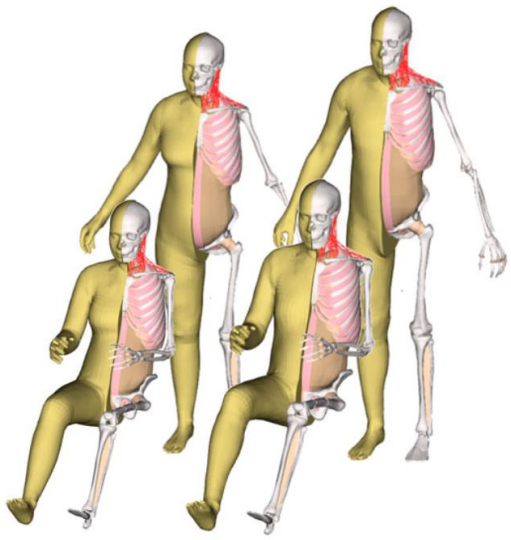
Vehicle Safety Institute

# Morphing of Human Body Models

## Background

Human body models are increasingly being used in crash simulations instead of crash test dummies. The potential accident scenarios to be simulated can be very diverse, including vehicle occupants, cyclists, scooter riders, pedestrians and more. As a result, these human body models need to be morphed into many different poses. This can be challenging, especially for changes in joint angles and manual reworking is usually necessary (e.g. remove penetrations, …).



*The VIVA + model (HBM) lineup: the base model of the average female with the derivative male and corresponding standing versions.*
*Source: Hello, world! VIVA+: A human body model lineup to evaluate sex-differences in crash protection (https://doi.org/10.3389/fbioe.2022.918904)*

## Goals

- Finding new morphing approaches to reduce manual reworking.

## Tasks

- **Familiarization** with existing python morphing code.
- **Familiarization** with different morphing approaches.
- **Application** of the existing morphing code for different target postures.
- **Identification** of emerging problems such as penetrations.
- **Finding** causes and solutions to these problems**.**
- **Incorporate** solutions into the existing python morphing code.

## Suitable for students of

- MSc Mechanical Engineering/Mechanical Engineering and Business Economics interested in programming.

## Organisational overview

- Start: anytime
- Performance bonus: € 2.500,- (up to 4000,- for excellent work)
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