

PIPER

Position and Personalize Advanced Human Body Models for Injury Prediction



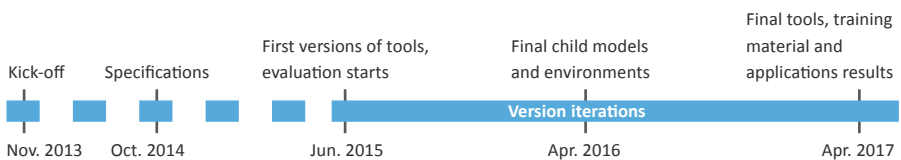
MOTIVATION AND OBJECTIVES

In passive safety, advanced Human Body Models (HBM) based on the Finite Elements method have the potential to represent the population variability and improve injury predictions. However, they are underutilised in R&D. Reasons include difficulties to position HBMs – typically available in only one posture – in vehicle models, and the limited representation of the population variability (size, weight, etc.).

The main objective of the PIPER project is to develop new “user friendly” tools to position and personalise these advanced HBMs. By facilitating the generation of population and subject-specific HBMs and their usage in production environments, the tools will enable new applications in industrial R&D for the design of restraint systems as well as new research applications.

PROJECT PLAN, MILESTONES AND DELIVERABLES

The following figure provides a simplified overview of the project expected timeline for the tools development, model improvement and surrounding applications.



TECHNICAL APPROACH

- Definition of specifications with future industrial and academic users
- Development of a modular, human body model neutral framework to facilitate future evolutions, availability under an Open Source exploitation strategy and extensive dissemination driven by the industrial partners
- Combination of proven approaches and innovative solutions transferred from computer graphics, statistical shape and ergonomics modeling
- Extensive evaluation in actual applications with several adult and improved child models (WP1), development of predictors of posture and shape (WP2) to help drive the new personalisation and positioning tools (WP3)

ACHIEVEMENTS

- WP1** Survey to determine priorities for the future tools (results on the website), work on child models improvements (e.g., a) a new neck and shoulder)
- WP2** Evaluation of segmentation approaches (e.g., b) trunk skeletal shapes) to support statistical shape descriptions and the preliminary shape database
- WP3** Evaluation of state-of-the-art methods to position and personalise (e.g., c) a thorax shape change) and internal release of the first version (d) Child and GHBMC models)

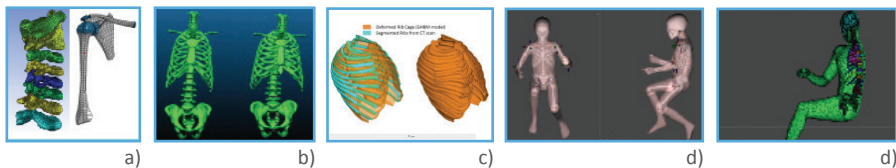


Illustration of some activities: a) child model improvements: neck and shoulder; b) trunk skeletal shape modeling; c) thorax shape change; d) Child and GHBMC models

Budget	4 M€	Funding	3 M€
Duration	42 months	Start	November 2013
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