

# Haptic Simulation and Human Interfaces



Industrial Forum  
Summer School on Surgical Robotics 2015  
Montpellier  
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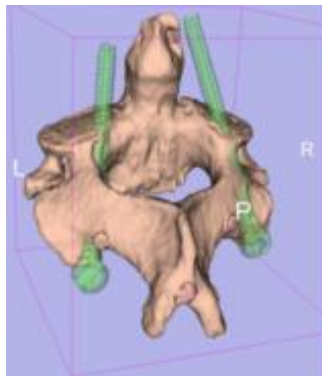
# Introduction

Humans



# Academic Background

EPFL - Laboratoire de Systèmes Robotiques





# Academic Background

Stanford University – Artificial Intelligence Laboratory



# Force Dimension

A 10 Year Journey



# Force Dimension

First Product





# Force Dimension

## Medical Applications



# Force Dimension

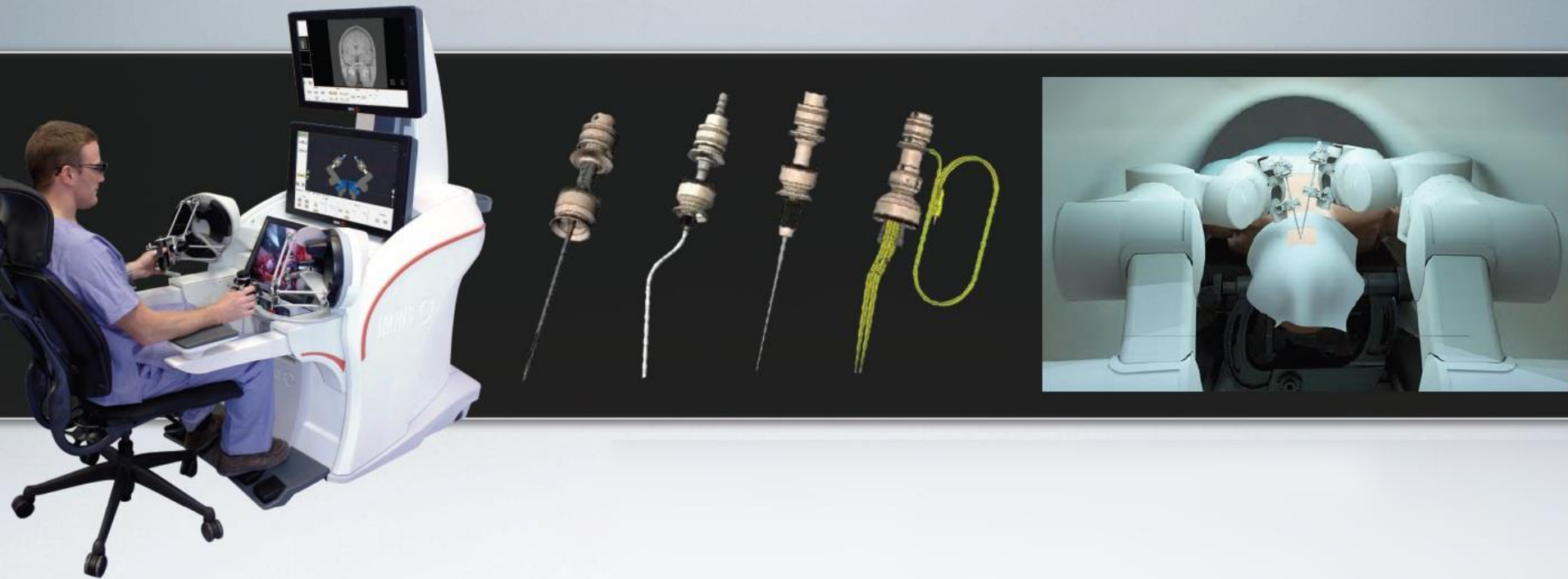
## Medical Applications





# Force Dimension

Medical Applications



# Force Dimension

Medical Applications



# Force Dimension

Medical Applications





# Force Dimension

Medical Applications



# Force Dimension

Medical Applications



# Force Dimension

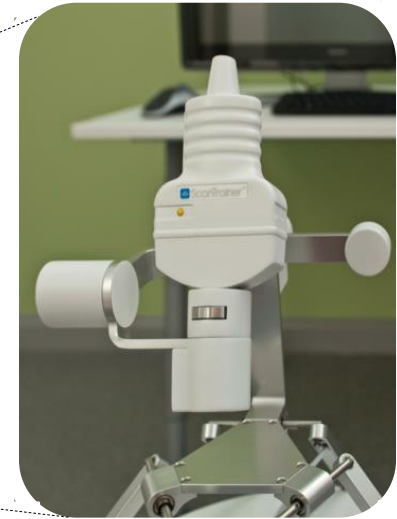
## Medical Applications





# Force Dimension

## Medical Applications



# Force Dimension

Entertainment



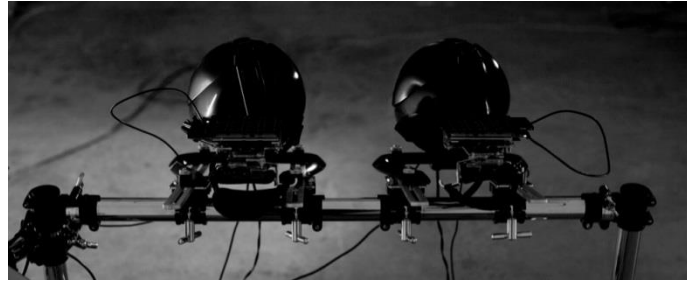
**omega.3**  
\$20'000



**Falcon**  
\$200

# Force Dimension

## Entertainment





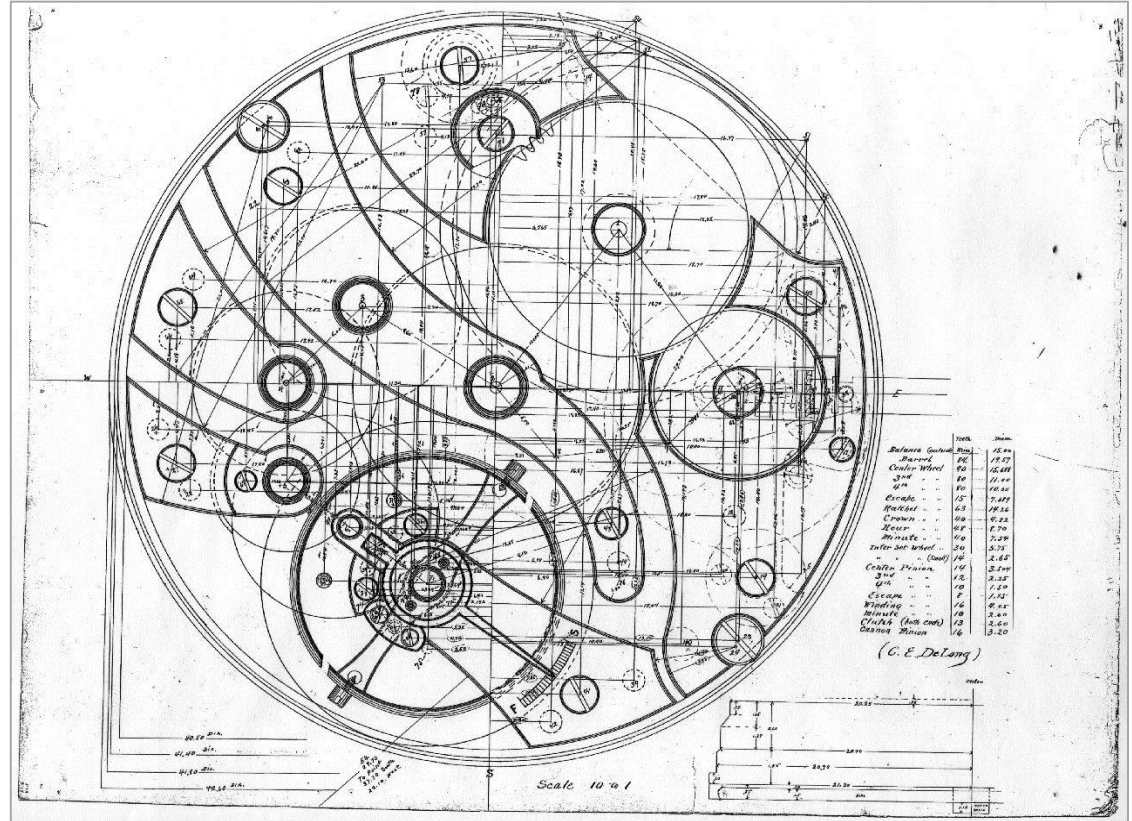
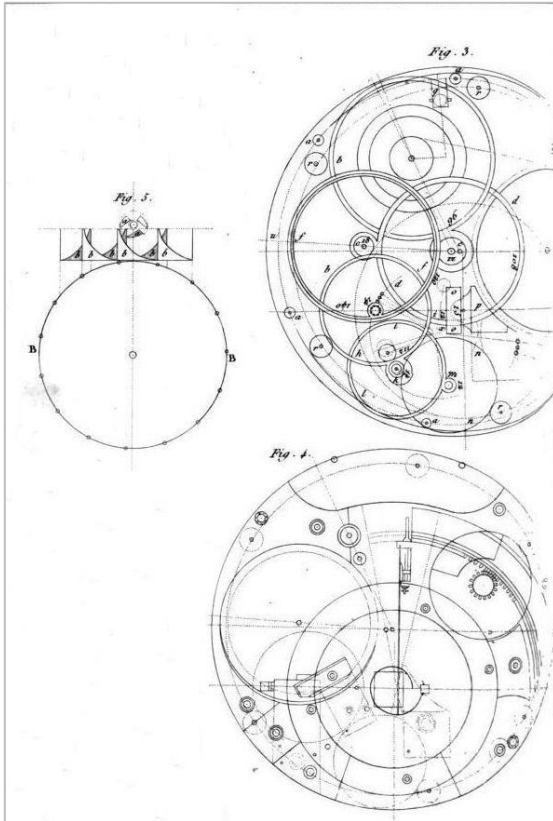
# Introduction

## Mechanical Design



# Introduction

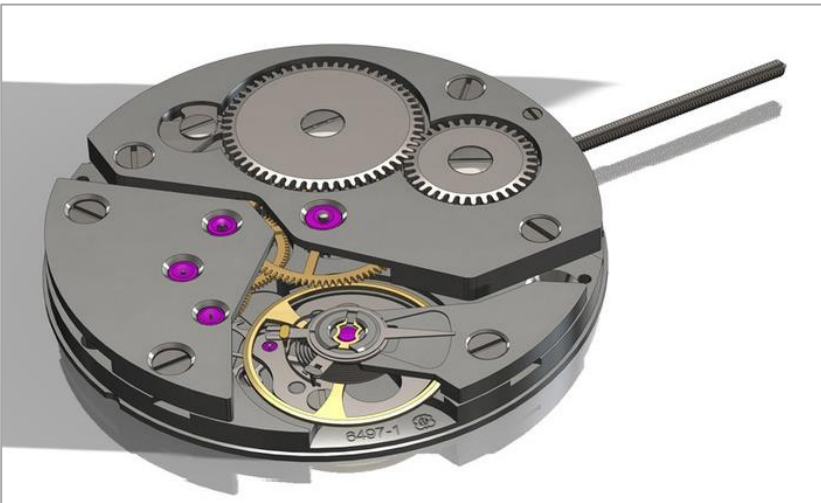
## Mechanical Design



The principles of Mr. Harrison's time-keeper, 1767

# Introduction

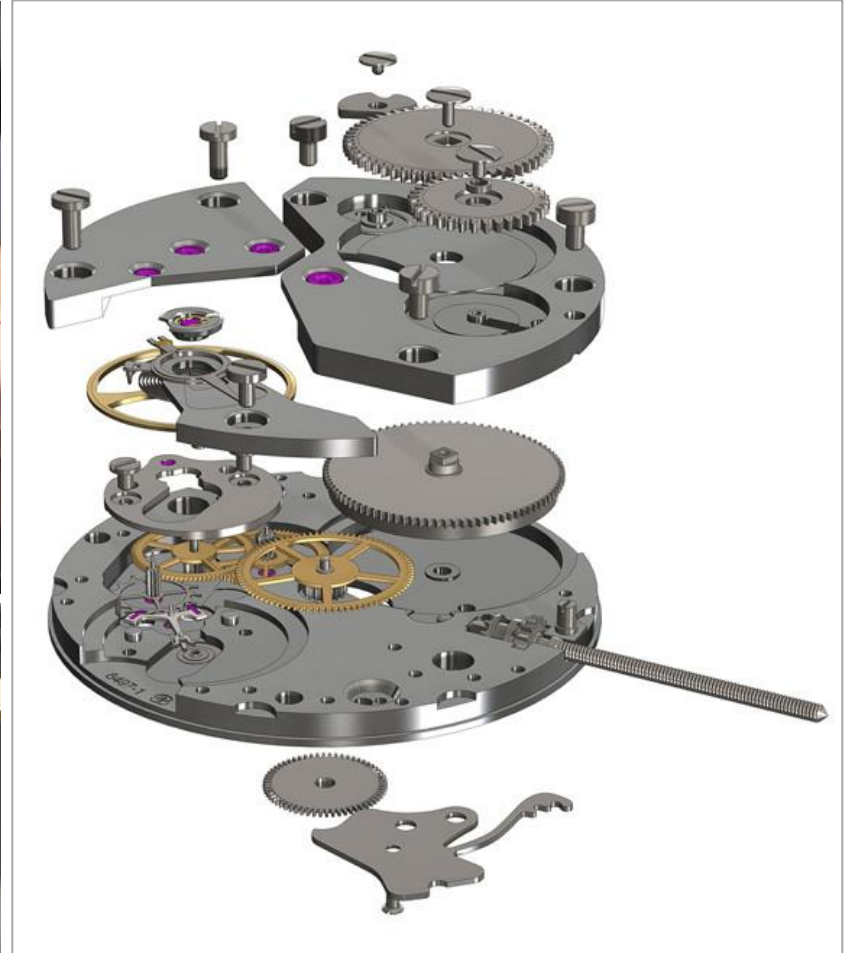
CAD





# Introduction

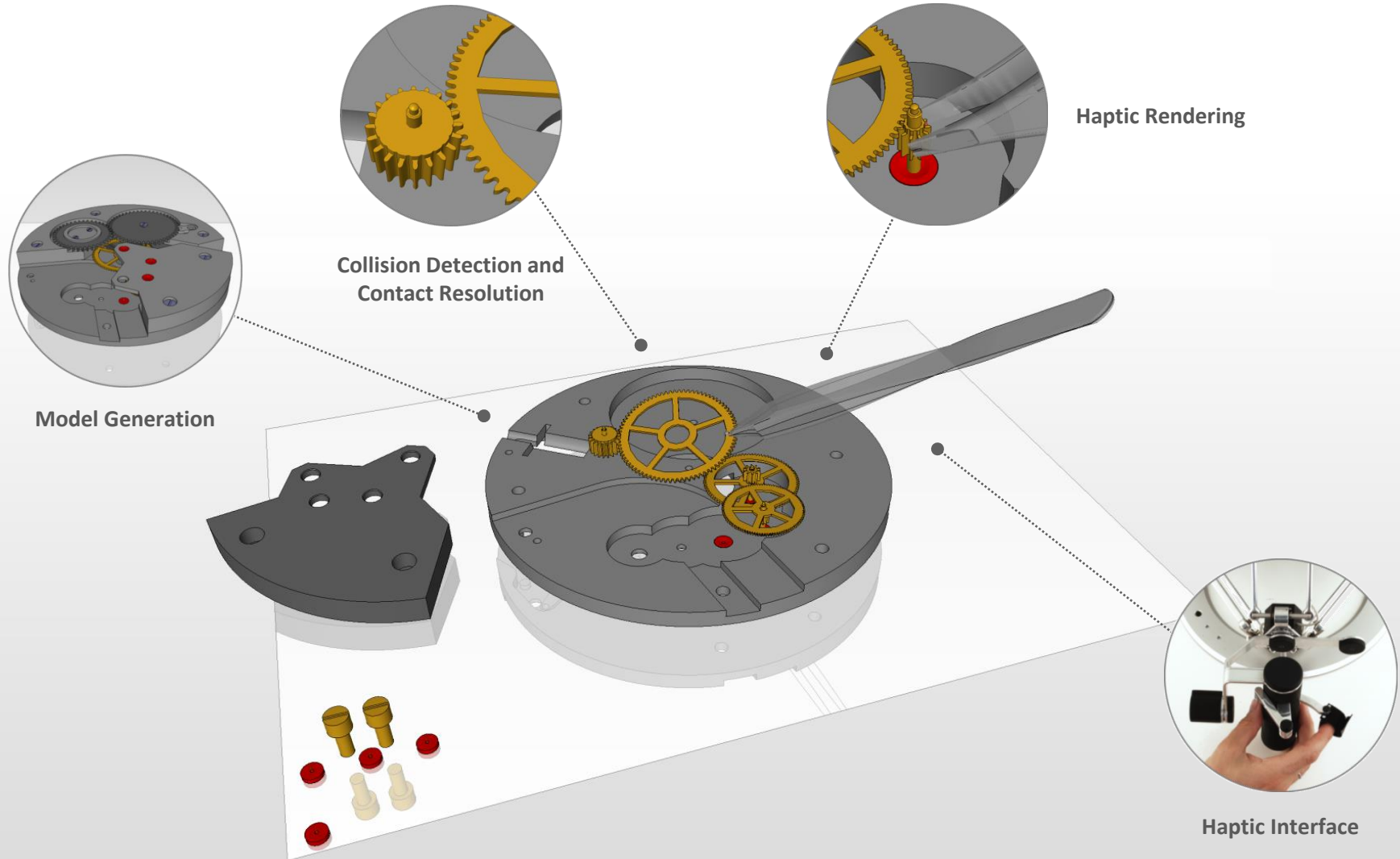
## Assembly





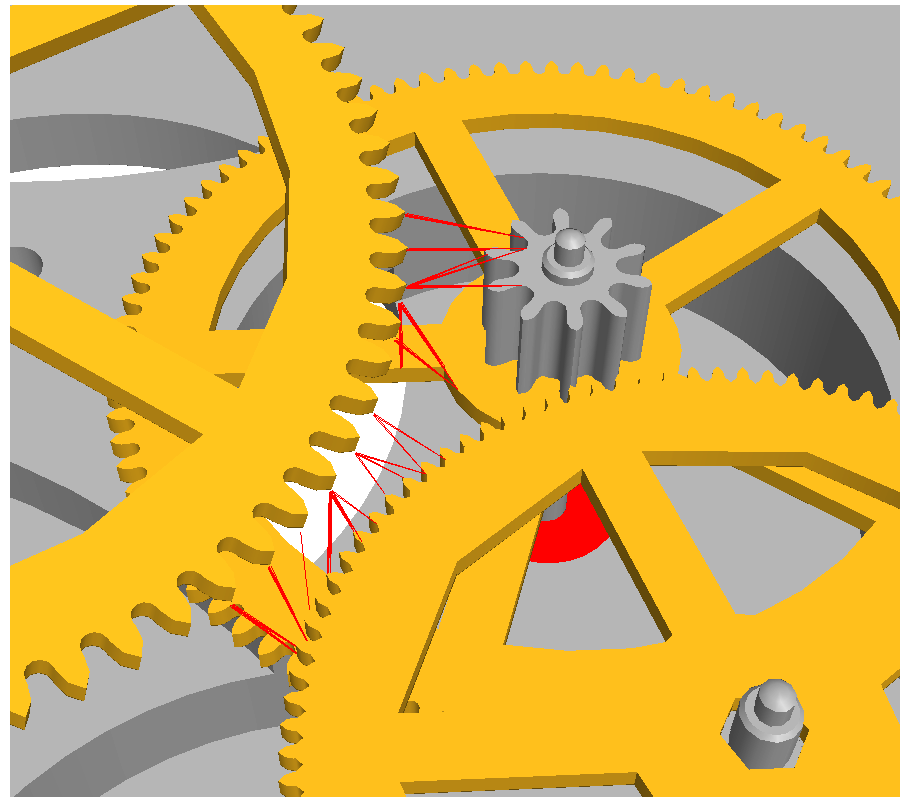
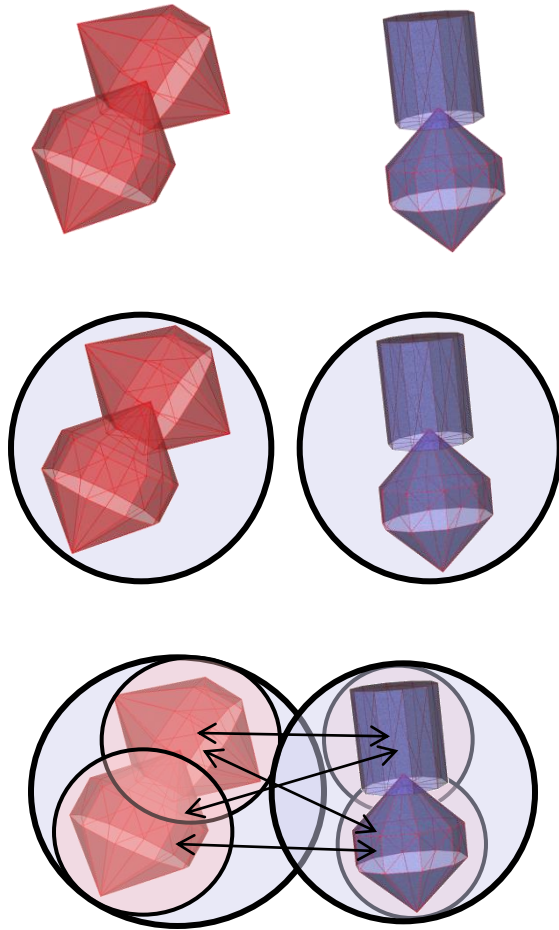
# Haptic Simulations

## Foundations



# Distance Computation

## Bounding Volume Hierarchies



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