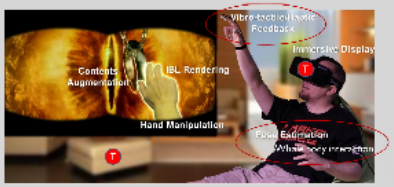
Human-Digital Content Interaction for Immersive 4D Home Entertainment

The Whole Picture:
Immersive and Interactive Mixed Reality



Interaction techniques for the immersive MR contents

- Use hands/fingers (Direct interaction)
  - Tracking: Kinect, Leap, Glove, Camera-image, Camera-Fiducial
    - Outside in vs. Inside out
  - 2 Finger Pinch
    - Natural and intuitive
    - For selection and manipulation
    - Pinch/release detection (Ewha)
  - Multimodal
    - Visual: Real / Virtual (Ewha)
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    - (Vibro)Tactile
      - Application of tactile illusion (minimize actuators)
      - Extension to ring-like design (improve wearability)
    - Kinesthetic (Ewha also)
      - Vibro-tactile rendering methods for different effects (richer experience)
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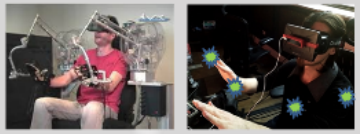
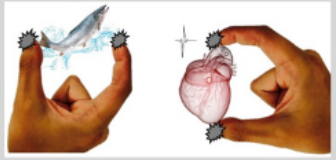
Year 1

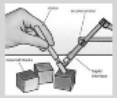


Intricate haptic device is not so convenient ... and simple vibration cannot convey much ...



Use illusion, multimodality fusion and rendering variation to create wearable yet richer experience

Year 2



$$Q(t) = A(v)e^{-Bt}\sin(2\pi\omega t).$$

Material	$A\ (s^{-1})$	$B\ (s^{-1})$	ω (Hz)
Rubber	-240	60,000	30
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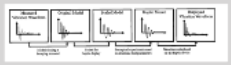
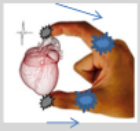
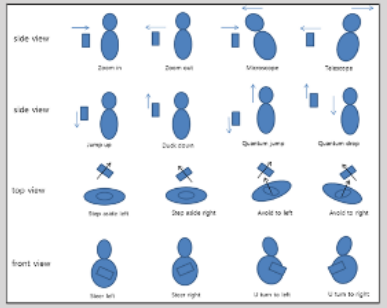


Vibro-tactile rendering for various effects



Ring-type: Improving wearability / Validation

Year 3



Detecting body dynamics and associating it to contents

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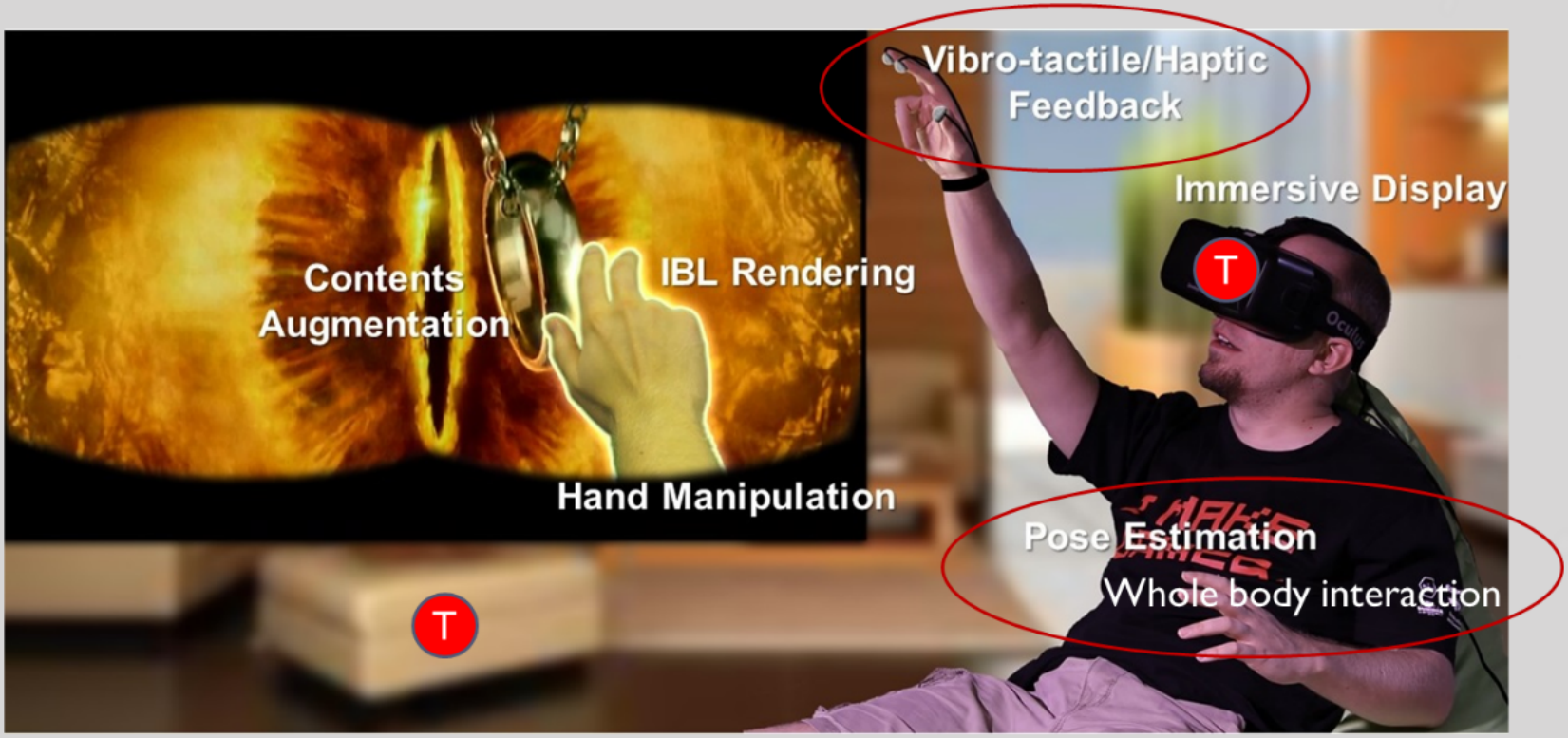

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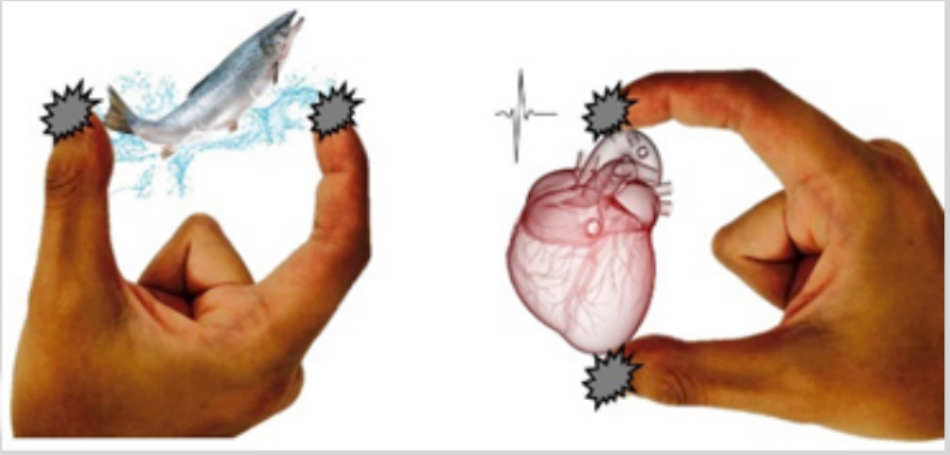

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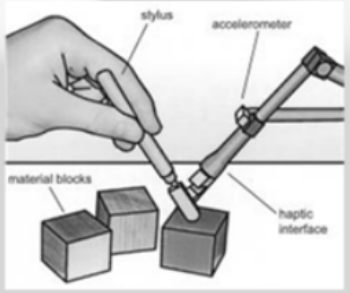

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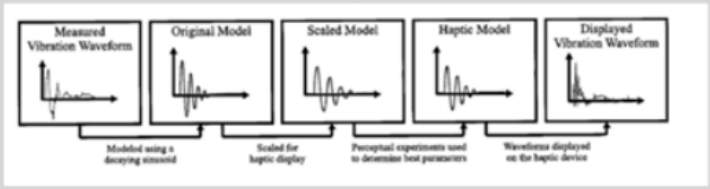

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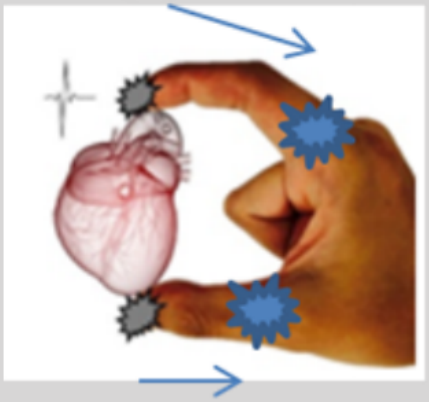

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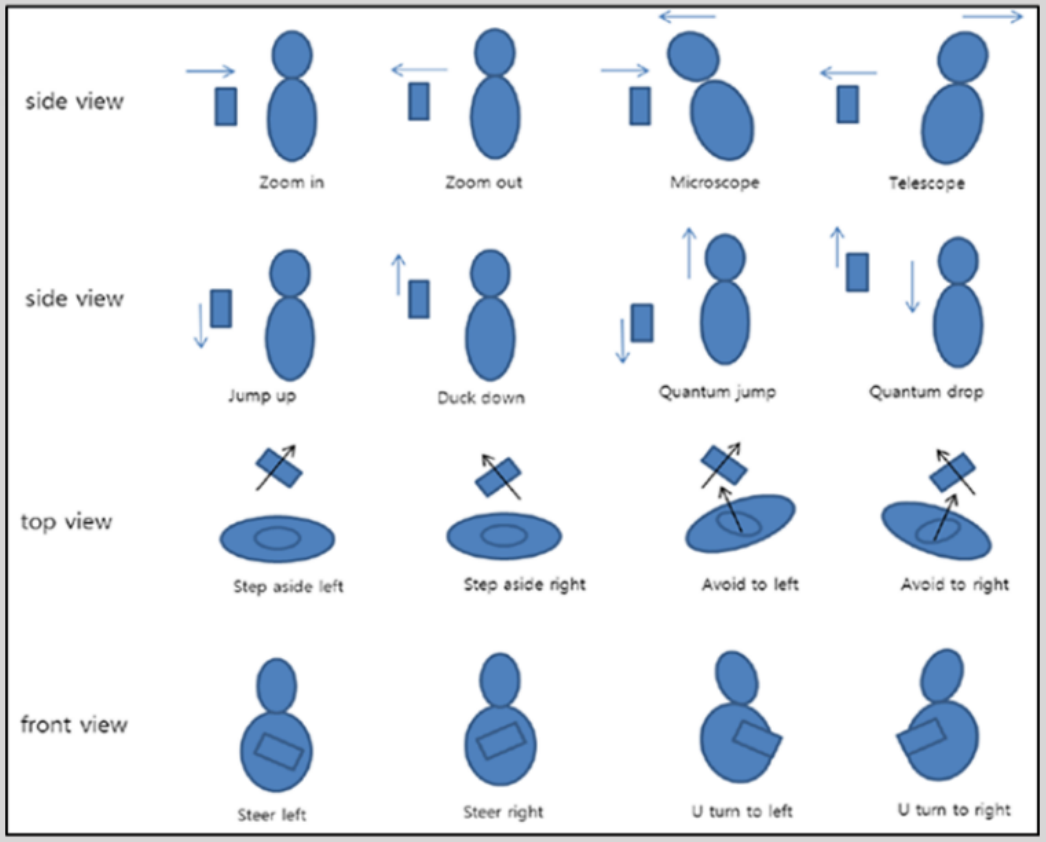
Year 3

Little movement

Big movement



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