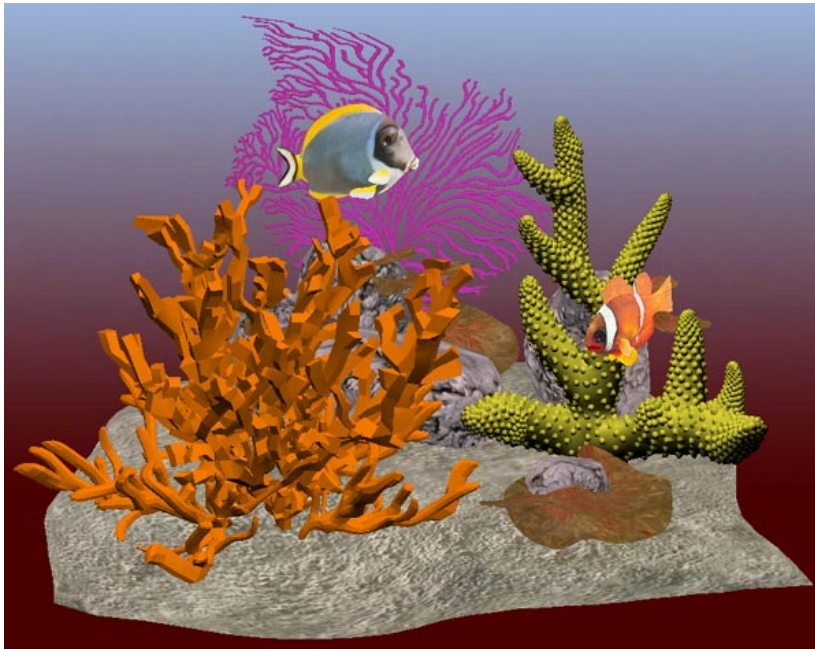# Towards a Workflow and Interaction Framework for Virtual Aquaria

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Hands-off Science

- **Modern science museum**
  - Hands-on science
  - Engaging interaction
- **Hands-off environment**
  - Aquaria & zoos
  - Touch tanks & petting pens
- **Dynamic environment**
  - Specimens are born, grow and die
  - Information transfer

Interactive Aquarium
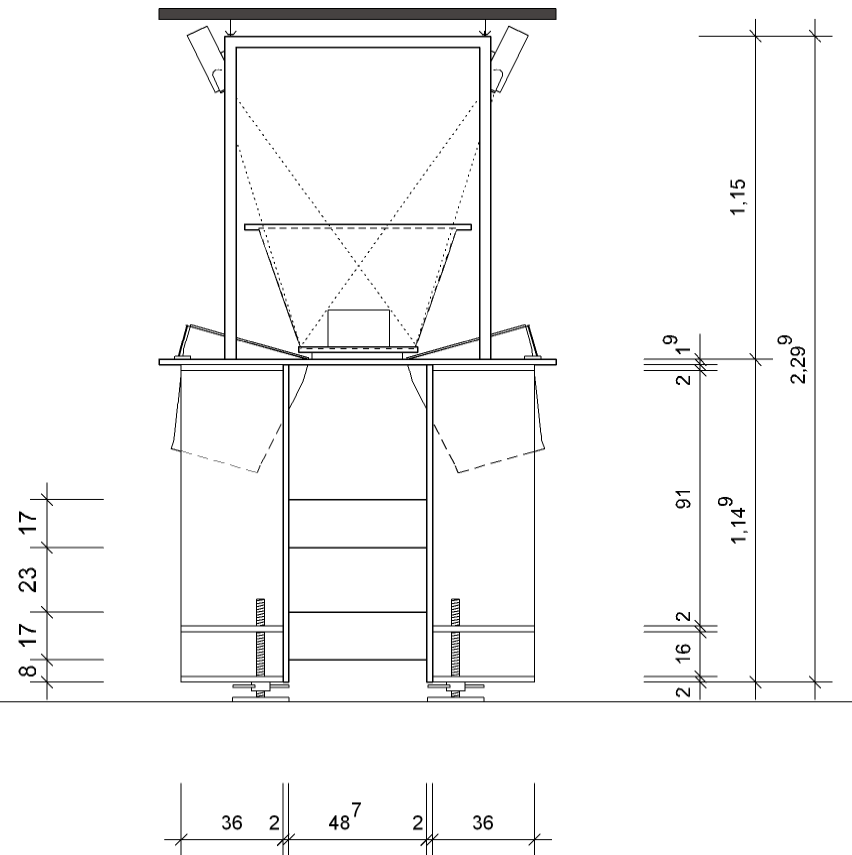
- **Three integrated systems:**

Virtual Aquarium

Mobile Interaction Panel

Stationary Interaction Panel

Virtual Aquarium

- **Showcase Optical AR display**

The Virtual Showcase

- **Characteristics:**
  - Designed to protect
    - Expensive & delicate hardware
    - Specimens
  - Passive stereo
    - Monitor based displays
    - Inexpensive optical tracking

Workflow

- **Content creation by:**
  - Non-technologists
  - Designers
- **Based on standard modeling tools**
  - 3D Studio Max
  - Maya
- **Consistency between modeling tool and VR|AR display**

Workflow

- Modeling tool
    + nVidia's CgFX plugin
    + nVb [nVidia binary] exporter
- Export to nVb formatted scene file
- Import nVb scene to Virtual Showcase Viewer

Workflow

- Export to nVb
  - CgFX shaders
  - Meshes, lights, cameras
  - Key-framed animation
  - Constrained kinematics
    - 3DSMax's BIPED
- Disadvantage: nVb is not standardized
- Advantage: tweakables → input devices

Virtual Aquarium

Interaction Panels

- **Stationary Information Panels**
  - Touchable video stream of live aquarium
  - Dynamic Information Panel
  - Virtual Aquarium controls
  - Storytelling elements
- **Mobile Information Panels**
  - Group learning tool
  - Links to Stationary Information Panel