A Virtual and Interactive Light-Art-Like Representation of Human Silhouette

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Introduction

Light-art: Trajectory of pen-lights

(Traditional) Light-art
- Time-consuming (10-20 seconds per frame creation)
- No interactivity

PiKAPiKA(Light Painting) - Flash at BEAT IT, https://www.youtube.com/watch?v=nVJJC17Un6Y&t=185s

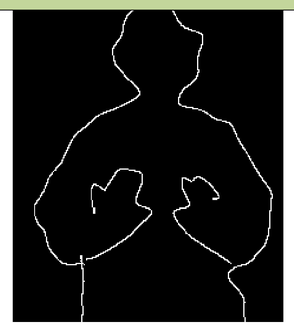
Goal
- Real-time light-art
- Interactive participation

Proposed technique

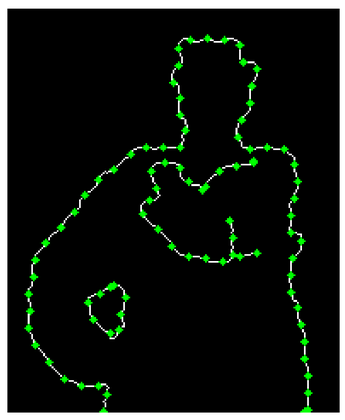
Step 1. Edge detection

Interior edge detection from depth images

Depth image → Detected edges



Step 2. Simplification



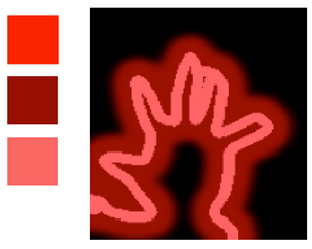
- Edge representation by small number of nodes and edges

Step 3. Hand-stroke-like deformation

Stroke deformation algorithm modified from [Wood, 2012]
- Randomly move end & corner vertices

Step 4. Neon-like rendering

Real neon

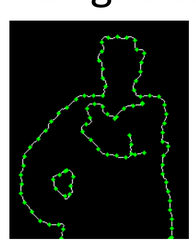


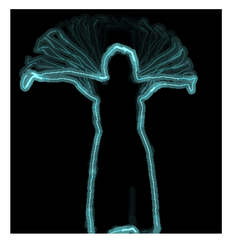
Our representation

Step 5. Visual effect

Computation time

Real-time light-art creation

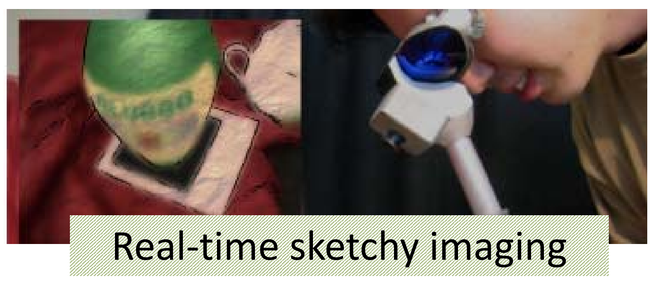




Process	Time (sec.)
Edge detection	0.010
Simplification	0.001
Deformation	0.001
Neon rendering	0.002
Visual effect	0.003

Related work

1. A Loose and Sketchy Approach in a Mediated Reality Environment [Michael, 2005]



Real-time sketchy imaging

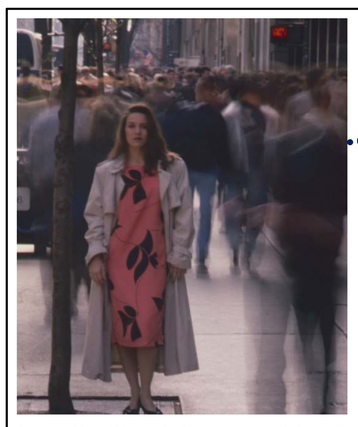
2. Sketchy Rendering for Information Visualization. [Wood, 2012]

Hand-stroke-like deformation

3. VIDEOPLACE an artificial reality.[Krueger, 1985]

Interaction with human silhouettes

Interactive artwork development



http://williamlulow.com/blog/creative-use-of-shutter-speed

Loneliness

Interactively switch background scenes based on distance between the person and screen

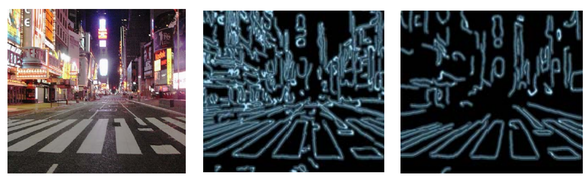
Example

Closely looking:
- Detailed background
- More walkers
- Brighter colors

Distantly looking:
- Simpler background
- Less walkers
- Darker colors

Additional process

- Light-art-like background images
  - Ten images adjusting blurs
- Light-art-like background walkers
  - Up to six persons detected by Kinect
- Blackly painting of persons
  - No transparent human representation



Pictures from a taxi, http://picturesfromataxi.blogspot.jp/

Human silhouette by Kinect
Morphology by OpenCV
Smaller black silhouette painting

Future work

Light-art representation
- Improvement of edge detection
- Variation of neon colors
- One-stroke drawing

Interactive artwork
- Immersive system
- Happy-end stories