MagicToon: A 2D-to-3D Creative Cartoon Modeling System with Mobile AR

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Major Components

• Automatic 2D to 3D cartoon model creator

• Interactive model editor to construct complicated scenes
Related Work

• Similar products in this space only allow colouring and hence do not allow the child to be creative
Implementation
Segmentation

- Scale image
- Get outline
- Map different regions
- Merge different regions
- Combine outline with region map to obtain temporary region map
- Morphological erosion to remove the outline
- New region map which is the final mesh
Mesh Generation

- Generate mesh only for extreme boundaries
- Apply Delaunay triangulation to each boundary for getting discrete vertices
- Inflate mesh by calculating distance of every pixel from the nearest black pixel and then applying circular mapping function to smooth height values
- Apply Laplacian smoothing method
- Use tone based shading to stylise
Interaction and Animation

- Allows merging of regions
- Transformations and copying supported
- Animate objects by adding skeleton to the 3D model and then use predefined motions
Results

- Inflation was a time consuming process as too many calculations
- Since this was done one iPad 2 current process should be faster
- Segmentation and mesh generation can be used in our models. We don’t need these interactions or animations though
Limitations

• Lighting/ reflection can hinder segmentation
• Outlines should be thick and enclosed
• Depths between paths not captured
• Angle of the image captured matters a lot
• The front view image is replicated as back view. Might not be true in our case
Thank you!