

## Mobi3DSketch: 3D Sketching in Mobile AR



Communications & Information

Computer/AI/Data Processing and Information Technology



(a) 3D sketching in mobile AR



(b) "Phoenix" (34.2 mins)

### IP Status

Patent granted



Technology Readiness  
Level (TRL) ?

6

### Opportunity

Mid-air 3D sketching has been mainly explored in Virtual Reality (VR) and typically requires special hardware for motion capture and immersive, stereoscopic displays. The recently developed motion tracking algorithms allow real-time tracking of mobile devices, and have enabled a few mobile applications for 3D sketching in Augmented Reality (AR). However, they are more suitable for making simple drawings only, since they do not consider special challenges with mobile AR 3D sketching, including the lack of stereo display, narrow field of view, and the coupling of 2D input, 3D input and display.

3D sketching is a new type of art form. Many tools are developed for 3D sketching, such as Google Tilt Brush, Just a line, and Facebook 3D Sketch. However, they are either expensive or hard to use. This invention provides a cheap and effective solution for 3D sketching, which is accessible for the general public. The invention allows users to create more complex, large-scale sketches outdoors, which is very difficult for existing 3D sketching systems. We believe that this system could allow more people to perform 3D sketching easily. It also provides an effective interface to create high quality sketches.

### Technology

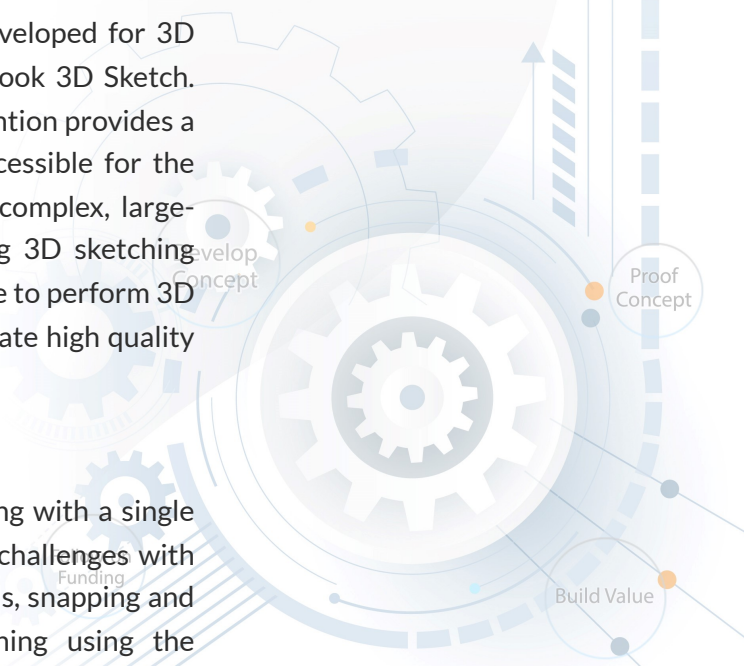
This invention presents a powerful interface for 3D sketching with a single mobile device using AR technology. To address the special challenges with mobile AR 3D sketching, we adapt two commonly used tools, snapping and surface proxies. Our system allows users to draw 3D sketching using the absolute and relative drawing modes. Although most of these techniques

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have already been individually studied in other applications, we carefully unify them into a powerful workflow to develop a mobile AR 3D sketching system. We provide a simple but effective method for users to create proxies with a single mobile device. Users can create a proxy by pressing a button, and a new proxy will be created according to the current position and orientation of the device. This allows easy creation of proxies to align with real-world surfaces. Users can also create snapping points by tapping on stroke or proxy. The strokes, points, and proxies in our system are highly integrated with each other in order to reach different design goals.

## Advantages

- Large-scale or distant objects could be created
- Effective interface to create high quality sketches
- Accessible for both indoor and outdoor environments
- Less expensive

## Applications

- 3D sketching for both indoor and outdoor environments
- 3D concept designs for creative art designs, landscape architects, and real-world annotation
- Mobile application

