PaintMobile3D: A Novel Android Application to Draw in 3D

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Abstract

Traditional 3D painting software has relied on building a two-dimensional representation of three-dimensional space in which the user can rotate, pan, and zoom. PaintMobile3D takes a different approach. As smartphones become faster and more feature rich, we can take advantage of these improvements to do things that would previously be infeasible. Using a phone's camera, accelerometer, gyroscope, and/or compass, PaintMobile3D can track the users movements as they move the phone around in the real world, allowing them to draw in 3D, based on the movements of the device in the real world. The user can pick from different colors and can make multiple "strokes" using the phone to create more advanced drawings.

Author Keywords

smartphones, android, drawing, computer vision

ACM Classification Keywords

H.5.2 [Information interfaces and presentation (e.g., HCI)]: User Interfaces.

General Terms

Design, Algorithms, Human Factors

Introduction

For some time, modeling 3D has been a difficult task due to the problems of the inherently 2D interaction model provided by computers. By adding a physical aspect to this, we make it intuitive for users to develop 3D content quickly and casually. Though there have been other solutions that allow 3D drawing, the ubiquity of smartphones makes the barrier to entry much lower. A user could casually decide to waste some time by sketching an object while waiting for a friend, or perhaps, when seized by a creative fit while out and about, make a quick sketch of an idea and export it to common 3D formats to be refined with traditional 3D software.

At its core, PaintMobile3D is about taking the motion of a phone and translating it into 3D coordinates, used to draw a model. This is done using the various sensors on modern smartphones: accelerometers, compasses, and cameras. Newer smartphones also add gyroscopes. Even with all of this data, it is difficult to keep track of the phone in realtime due to the noisyness of the signal. Hol, et al. [1] created the approach used in this software to maintain the phone's location.

Figure 1: Insert a caption below each figure. Images can "float" around body text, like this example.

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References

[1] Hol, J. D., Schn, T. B., Luinge, H., Slycke, P. J., and Gustafsson, F. Robust real-time tracking by fusing measurements from inertial and vision sensors. *Journal of Real-Time Image Processing 2*, 2-3 (Nov. 2007), 149–160.