

Algorithmic Cloud Pictures: Transforming Clouds into Similar Objects

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EE368 Final Project

Project Proposal

It is a common game for the creative minds of human beings to look at the amorphous shapes of clouds and attempt to map them to more easily recognized objects. The process of this, it is proposed, can be replicated through image processing techniques and implemented into an entertaining game for users. The project proposed would allow for an easily extensible framework for this to occur. A user would be able to capture an image with a mobile device (specifically an Android phone), and then attempt to guess the shape the cloud will be morphed into before the final transformation occurs. From a technical standpoint, a general algorithm for performing this transformation would have the following steps:

- 1) Pre-processing to enhance key features
 - a) Contrast enhancement
 - b) Edge enhancement
- 2) Algorithmic identification of image features [1]
 - a) Identify the defining features of the cloud's shape
- 3) Query a database of known objects to find closest match [2]
 - a) Given known features, compare with database
 - b) Find object most closely related
 - c) Tag known object with its name, to be guessed by the user
- 4) Transform from cloud image to known object [3]
 - a) Apply slow image morphing techniques to create transformation

This project tackles several interesting image processing issues, and would allow for an application that may act as a stimulus for creativity in the user. The end goal is to bring to life the innate creativity in the human imagination by creating a framework that replicates common practices of the youthful mind.

References:

- [1] Lowe, David G. "Object Recognition from Local Scale-Invariant Features." The Proceedings of the Seventh IEEE International Conference on Computer Vision. vol 2. pp 1150-1157. 1999.
- [2] Jacobs et al. "Fast Multiresolution Image Querying." Proceedings of SIGGRAPH. 1995.
- [3] Fard, Mahmood. "Image Morphing in Frequency Domain." Journal of Mathematical Imaging and Vision. vol 42. pp 50-63. 2012.