

How to Tell the Difference Between a Dog and a Cat

M. Alipour and A. Farhadi

School of Mathematics

Institute for Studies in Theoretical Physics and Mathematics (IPM)

Tehran, Iran

Devising an algorithm to distinguish between a dog and a cat is a good test for image understanding techniques. The issue is finding effective numerical invariants which enable a computer to differentiate between images of dogs and cats. One associates to an image a “characteristic” surface using linear predictive coding coefficients. The geometry of the characteristic surface, which is highly non-smooth, is studied using techniques from computational geometry. A numerical discriminator is then introduced to distinguish between dogs and cats. The discriminator in essence makes use of the texture structure of the image and has been highly successful on images of real cats and dogs but prone to make mistakes on images of toy cats and dogs. The proposed method is not an image matching algorithm and makes no use of a data bank.