

# Modelling the Texture of Paint

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## Abstract

*We present an extension to the WET & STICKY model. A method of modelling textured and shiny paint is described using bump mapping and standard illumination models. The qualities of the paint are used to supply input to the texture and lighting models. We demonstrate that a dynamic model of textured paint provides the user with valuable visual clues for the production of realistic painted images. We also propose further extensions which would allow the use of different lighting models for different paints, allowing for paint attributes which are unachievable either with traditional painting or with earlier forms of electronic painting.*

**Keywords:** simulation, electronic paint system, bump mapping, interaction, parallelism.

## 1. Introduction

Electronic paint systems usually model the process of applying 'paint' solely in terms of changing the colour of a brush footprint to or towards a specified paint colour. This is a quite incomplete model of what can be seen when real paint is applied and in particular such properties as the surface texture of the paint, which can put local variations into its nominal colour, are not taken into account. This paper is about an electronic paint system, the WET & STICKY system [Cockshott 91], which models the 'naturalistic' properties of real paints, and in particular about how surface texture is modelled and rendered to give the appearance of the superficial textures of 'real' paint. The paper is essentially in two parts, the first describing how WET & STICKY simulates the behaviour of real paint through computationally lightweight analogues of its properties and concentrating on those properties which affect surface texture, and the second describes how we extract a quantity which can be interpreted as the instantaneous height of the paint above the substrate and how we calculate the necessary illumination parameters from it. Photographs showing the texture of flowing paint produced using WET & STICKY and rendered using well-known illumination models appear near the end of the paper.

The origins of the WET & STICKY system arise from the expressed dissatisfaction of many critics with the sterile quality which tends to pervade the images produced with of electronic paint systems. To understand this dissatisfaction one only has to walk round almost any exhibition of paintings. If one closely examines the marks that make up the complete image it immediately becomes apparent the incredible range, variety, and complexity of these fundamental building blocks. If one now carries out a similar examination of electronic paint images one will see a much narrower range, a lesser variety, and a reduced level of complexity. The aim of WET & STICKY was to produce a model which would support the production of images whose marks possess