A shape recovery problem of book surface using two shade images under the fully perspective environments is discussed. In order to simplify the problem, the whole recovery process is divided into three sequential and explicit steps: preprocessing, apparent shape recovery, and generation of ortho-image. The separation of albedo and shading with reduced effect of interreflections is done in preprocessing step by applying image processing and a phenomena-based model. Implicit equations governing the shading and observation have been transformed into explicit ones having minimized number of unknown parameter. A direct and unique recovery become possible by combining the transformed ones and the recurrence relation. A feed-back recovery process is implemented as a practical algorithm which overcomes self-shadows. The results of simulations and real experiments show the properness and acceptability of the proposed approach and the implemented algorithms.
A divide-and-conquer strategy in shape from shading problem under fully perspective condition is proposed for the information recovery of book surfaces. The whole recovery process is composed of... (More). A shape recovery problem of book surface using two shade images under the fully perspective environments is discussed. In order to simplify the problem, the whole recovery process is divided into... (More). Shape recovery of an object based on shading variations resulting from different light sources has recently been reconsidered. Improvements have been made that allow for the photometric stereo approach to serve as a competitive alternative to other shape reconstruction methods. Several papers reported using Perspective SfS (PSfS) methods applied to endoscopic image. The endoscopic perspective setup and photometric stereo. In order to provide the necessary ingredients to understand the geometry behind the model, we start by considering the parametrization of the surface $\mathbf{\Sigma}$ (see Figure 1) up to an unknown function $z$ from the image domain $\Omega_p = \Omega_p \cup \partial \Omega_p$ to $\mathbb{R}$, such that. (2.1). $M(x, y) = [\xi(x, y), \eta(x, y), \zeta(x, y)] := -x z(x, y), -y z(x, y), z(x, y)$. A strategy in solving the shape from shading problem for the shape and albedo recovery of book surfaces under the fully perspective environment is proposed. The whole recovery process is composed of... A feed-back recovery process using pure shade images is implemented as a practical algorithm in order to overcome self-shadows. Results of simulations and real experiments show the properness and acceptability of the proposed strategy and the implemented algorithms. Keywords. Shape Recovery Perspective Environment Photometric Stereo Iteration Error Apparent Shape.