

先端科学技術研究科 修士論文要旨

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論文題目	Analysis by optical models of one piece of ancient document with show-through		
要旨			
<p>There is a need to make the ancient paper document more readable in Japan, especially, some of them written or painted on both sides for reuse, which is called show-through. Our final goal is to separate the front and back sides images of the Literature documents from the photos including the back side show-through. The backside image can be inferred where the front side is not inked, but it is hard to determine if the ink is on the front side or double sides. We proposed a method to cancel the show-through from the image inked on the front and back sides and to detect the back side image from the mixed image of the front and back sides. We derive a physically-based model from the paper structure, which is composed of two filtering layers and the blur layer. We use a phenomenon that the brightness of the mount paper affects the show-through in reflection for the former. Moreover, we detect the backside inked area with simple formula depends on the mentioned model using photos taken in transmission and reflection. The reflectance of the front side could be obtained from solving the simultaneous equations of the two images taken on the two type mounts, dark and bright. We experimented with the factual objects and succeeded in the detection of the front side inked area. In addition, the backside detection image could be calculated with the mentioned model and easy formula.</p>			