

A Kind of De-noising and Segmentation Method for Hollow CAPTCHAs with Noise Arcs

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Abstract	<p>While many text-based CAPTCHA schemes have been broken, hollow CAPTCHAs as a new technology have been used by many websites. The generation method of currently used hollow CAPTCHAs is investigated, we found there is color difference between the boundary of characters contour lines and noise arcs. An algorithm of noise arcs removal to deal with this vulnerability is proposed. Furthermore, a de-noising and segmentation scheme for hollow CAPTCHAs with noise arcs is presented. The scheme is verified by the real CAPTCHA data from the website Sina Weibo. The success segmentation rate is 77%. Finally, some advice is given to improve the design of hollow CAPTCHA.</p>
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[CAPTCHA](#) [Color difference](#) [Hollow CAPTCHAs](#) [Human behavior](#) [Noise Arcs](#) [pubcrawl](#) [Resiliency](#) [scalability](#) [Segmentation](#)
