SMART REACH
(S/W CREATORS & TRAINERS)

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Captcha as Graphical Passwords—A New Security Primitive Based on Hard AI Problems

Abstract:

Many security primitives are based on hard math- ematical problems. Using hard AI problems for security is emerging as an exciting new paradigm, but has been under- explored. In this paper, we present a new security primitive based on hard AI problems, namely, a novel family of graph- ical password systems built on top of Captcha technology, which we call Captcha as graphical passwords (CaRP). CaRP is both a Captcha and a graphical password scheme. CaRP addresses a number of security problems altogether, such as online guessing attacks, relay attacks, and, if combined with dual-view technologies, shoulder-surfing attacks. Notably, a CaRP password can be found only probabilistically by automatic online guessing attacks even if the password is in the search set. CaRP also offers a novel approach to address the well-known image hotspot problem in popular graphical password systems, such as PassPoints, that often leads to weak password choices. CaRP is not a panacea, but it offers reasonable security and usability and appears to fit well with some practical applications for improving online security.