Writing on Clouds

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Abstract

We are interested in achieving the best possible recognition rates for hand-written mathematics. This problem has challenges that go beyond the usual natural language handwriting recognition: multiple alphabets are used, the number of single-stroke and few-stroke symbols numbers in the hundreds, writers form symbols from some of the alphabets in idiosyncratic non-standard manners, layout is two dimensional, and there is no fixed dictionary of words to aid in disambiguation.

While writer-independent handwriting recognition systems are now achieving good recognition rates, writer-dependent systems will always do better. We expect this difference in performance to be even larger for handwriting math systems. In the past, it would not be too inconvenient for a writer to train a system on his or her computer. Today, however, each user will typically have multiple devices used in different settings, or even simultaneously.

We present a method to share training data among devices and, as a side benefit, to collect user corrections over time to improve personal writing recognition. This is done with the aid of a handwriting profile server to which various handwriting applications connect, reference and update. The user's handwriting profile consists of a cloud of sample points, each representing one character in a functional basis. This provides compact storage on the server, rapid recognition on the client, and support for handwriting neatening.