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IT'S NOT WHAT YOU TYPED, IT'S THE WAY YOU TYPED IT...

Typing patterns can predict a user's name and native language.

The way we type says a lot about who we are, with the rhythm and cadence of our keystrokes as identifiable as our handwriting or signature. However, it doesn't stop there. Keystroke Dynamics — the study of typing patterns, enables researchers to identify characteristics about the person at the keyboard. This includes things such as handedness, hand size, mood or typing style.

Our work, *Collecting and Leveraging Identity Cues using Keystroke Analysis* (CLICKA), evolved this idea of user identification to derive personal characteristics unique to the individual. This work focused on determining the name and native language of an anonymous user, based solely on *how* rather than *what* they typed.

The first experiment centred on determining the name of an anonymous user by collecting typing samples from 84 users. Participants completed several typing exercises, where the timing of each keypress and release was recorded. The research hypothesised that a user would type a familiar combination of

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keys more quickly. As such, the data were subdivided into short phrases containing two characters (bigrams) and ranked according to their typing speed.

The second experiment used a similar approach to determine the native language of an individual. Here, 492 participants were recruited from five native languages (English, French, German, Italian and Spanish), with an event split across each group.

The research used machine learning classifiers to develop models capable of predicting both a user's name and native language. The name prediction achieved a balanced accuracy of 70% of the bigrams in a user's name. Native language prediction achieved a balanced accuracy of 71% when comparing English against everything else. When predicting based on all five language categories, the accuracy dropped to 45% — still considerably better than a random prediction.

The key takeaway of this project is that it is possible to predict identifying characteristics about a user based on their typing patterns. This often requires a small sample of data, with participants only typing 200 to 300 words.

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