Fingerprint Recognition of Young Children

ABSTRACT:

In 1899, Galton first captured ink-on-paper fingerprints of a single child from birth until the age of 4.5 years, manually compared the prints, and concluded that "the print of a child at the age of 2.5 years would serve to identify him ever after". Since then, ink-on-paper fingerprinting and manual comparison methods have been superseded by digital capture and automatic fingerprint comparison techniques, but only a few feasibility studies on child fingerprint recognition have been conducted. Here, we present the first systematic and rigorous longitudinal study that addresses the following questions: (i) Do fingerprints of young children possess the salient features required to uniquely recognize a child? (ii) If so, at what age can a child's fingerprints be captured with sufficient fidelity for recognition? (iii) Can a child's fingerprints be used to reliably recognize the child as he ages? For our study, we collected fingerprints of 309 children (0-5 years old) four different times over a one year period. We show, for the first time, that fingerprints acquired from a child as young as 6 hours old exhibit distinguishing features necessary for recognition, and that state-of-the-art fingerprint technology achieves high recognition accuracy (98.9% true accept rate at 0.1% false accept rate) for children older than 6 months.

INTRODUCTION:

GALTON first explored the feasibility of using fingerprints for identifying young children in the year 1899. He obtained inked fingerprint impressions of a newborn from birth until 4.5 years of age, manually compared them, and conjectured that it was possible to use fingerprints to recognize children older than 2.5 years of age. Since Galton's study on fingerprinting young children, there have been significant advances in digital capture and automatic comparison of fingerprints. The ink-on-paper fingerprint acquisition process has been mostly superseded by live scan methods, which directly provide a digital fingerprint image. Tedious manual comparison of fingerprints has been replaced by fast and robust automatic comparison methods. These

technological advancements, as well as emerging applications that require recognition of children, have reignited the interest of the fingerprint research community in investigating child fingerprinting, and have recently led to a few feasibility studies
on child fingerprint recognition.